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STUDIES IN THE LINGUISTIC SCIENCES

Papers in General Linguistics

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Papers in General Linguistics

REVIEW ARTICLE

Studies in the Linguistic Sciences
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UNNATURAL KIND TERMS AND A THEORY OF THE LEXICON [1]

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It is commonly taken for granted that the words in a language are, as a matter of linguistic convention, associated with meanings. This association is standardly represented in terms of functions from expressions of the language to the objects in the world, which the words (and compound expressions of the language) are claimed to denote. This article surveys the evidence that this common assumption is incorrect, and that much more often than is realized, the association is pragmatic rather than semantic, that is, a matter of inference rather than stipulation. Accepting this view requires abandoning the comfortable view of communication as the routine delivery of information safely packaged in linguistic expressions, in favor of a view whereby speaker and hearer must rely on assumptions about each other's goals and beliefs to reconstruct intended referents and predications from linguistic objects which function only as clues.

1. Introduction

It is commonly accepted that terms for natural kinds (i.e., biological species, naturally-occurring substances, and natural phenomena such as heat (but not sensations like pain)) are nondescriptional. That is to say, they lack any sort of Fregean sense, and instead rigidly designate the kinds they are used to refer to,[2] as Kripke 1972 has argued proper names designate individuals. It is less commonly accepted that this analysis extends to the majority of common nouns, perhaps on the assumption that human beings recognize essential differences between natural and artifactual kinds, and that these differences must therefore be reflected in language (Abbott 1989).[3] Much of the literature discussing this issue does not say anything about states and events, but it is probably fair to interpret this silence as rejection of the position that adjectives and verbs might be nondescriptional, especially since many of the arguments for nondescriptionality do not extend to states and events.

For Kripke, Putnam, and Abbott, it appears to be critical that the things that nouns are the names of be antecedently existing natural kinds, with 'essences'. I argue below that language-users do not know which kinds of things are natural, and which are artificial, so whether the kinds have essences or are privately perceived (see Nunberg 1978a) is immaterial to whether the nouns used to invoke them are logically names.

Section 2 of this paper reviews the distinction between descriptional and nondescriptional accounts of the semantic contribution of kind terms. Section 3 details the rationale for a nondescriptional theory of kind terms generally as an alternative to the (traditional) descriptional account. Section 4 demonstrates how the relativity of 'normal' beliefs about the relation of a word and a class of referents and the arbitrariness of choosing a unique such relation as the basic 'meaning' of a word argue against adopting an account of how words contribute to reference that depends on lexically stipulated relations between words and particular kinds. Section 5 provides an account of how communication can be as possible and effortless as it is in the face of the conclusion that the connection between words and their intended referents is infinitely variable (and therefore not a matter of lexical stipulation). In Section 6, I examine Abbott's arguments against treating artifact terms as nondescriptional, and then, in Section 7, I sketch an account for relevant phenomena which is based on a view of lexical semantics in which nondescriptional meaning is not limited to the small subset of nouns for natural kinds.

2. Descriptional vs. non-descriptional accounts

There is a certain ambiguity in the usage of the term *natural kind term*, with writers occasionally (cf. Abbott 1989:269) taking the Kripke-Putnam analysis of natural kind terms for granted and using *natural kind term* to denote the property of lacking a Fregean sense. Thus, they focus on the property of nondescriptionality, independently of any characterization of words which may or may not have this property. Other writers (Kripke 1972, Putnam 1975a, 1975b, Green 1983) use natural kind term and artifact term in their transparent, compositional senses, 'term for natural kind', 'term for artifact'. This is how I will use these terms in this paper.

Most familiar accounts of the meaning of individual words are criterion-based ('checklist') descriptional accounts. This includes Aristotelian analyses, feature-based analyses like those of Katz & Fodor 1963 and Weinreich 1966, predicate-based lexical decomposition (McCawley 1968), Labov's 1973 parameterized accounts, and translational accounts such as those of Wierzbicka 1972, 1980. Some prototype theories of meaning are criterion-based and descriptional. Descriptional accounts may be decompositional, spelling out the criteria for kind 'membership', or more attributive, doing no more than assigning kind membership to its referent. Thus, an attributive-descriptional account would say that, e.g., *teapot* means 'is a teapot'.[4]

According to descriptional accounts, the meaning of a word is a description that the (intended) referent satisfies. Saying that *horse* means 'large, strong animal with four legs, solid hoofs, and flowing mane and tail, long ago domesticated for drawing or carrying loads, carrying riders, etc.' (Webster's *New World Dictionary* 1968:701) would be a descriptional account. Descriptional accounts describe facts about objects, and treat those facts as criterial for kind membership.

Where descriptional accounts treat the fact that horses are called horses as something that follows from the meaning of the word *horse*, non-descriptional ac-

counts treat it as a social fact, a fact about social custom in a linguistically homogeneous group: the term folks use to refer to horses is *horse*. I hasten to emphasize that this account is not equivalent to a criterion-based, descriptional account which gives *horse* a meaning, namely, 'thing that is called a horse'.[5] If names had meanings that amounted to 'thing that is called by this name', then true sentences like (1a) and (1b) would be contradictions.

(1) a. John Robert Ross is not called John Robert Ross.
b. Haj Ross is not named Haj Ross.

It is no more defensible to claim that *horse* means 'is called a horse' than it is to claim that the name *John* MEANS 'is named John'. Both are just names that are associated, ultimately arbitrarily, with classes of individuals.

3. A nondescriptional account of kind terms generally

3.1 The problem of reference

As we shall see, Abbott's arguments that artifact terms should be treated as descriptional depend on the assumption that the essential properties that define natural kinds are different in nature from the essential properties that define artifacts, and on the assumption that human beings are able to recognize these differences. An account of terms for kinds that does not distinguish between natural and artifactual kinds will naturally not require or allow any such distinction. An alternative to the notion that kind terms are semantically associated with properties or characterizations of their referents was outlined by Nunberg 1978a[6] and approaches the domain that linguists have been accustomed to calling lexical semantics in terms of the problem of reference: How does a speaker's use of a word enable that speaker to successfully refer to a particular object, class, or concept (i.e., have her intention to refer to it recognized as such, following the Gricean account of the nature of meaning (Grice 1957))? Under a descriptional account of reference, if successful reference is to be accomplished, when a speaker uses a term, the addressee must be able to tell what subset of experience the term is supposed to denote. Thus, minimally, the addressee must correctly identify the sense (or intension) of the term, and from the sense, locate its extension in the real (or other relevant) world.

3.2 The problem of polysemy

It is a commonplace observation that most words have more than one (apparent) sense. This is evident from a glance into any desk dictionary. Thus, my *New World Dictionary* indicates three senses for *lemon* (837):

> 1. a small, egg-shaped, edible citrus fruit with a pale-yellow rind and a juicy, sour pulp, rich in vitamin C. 2. the small, spiny, semitropical evergreen tree that it grows on. 3. [Slang], something or someone undesirable or inadequate.

and five for *gold*(621):

> 1. a heavy, yellow, metallic chemical element with a high degree of ductility and malleability: it is a precious metal and is used in the manufacture of coins, jewelry, alloys, etc.: symbol, Au; at. wt., 197.2; at. no., 79: abbreviated G., g. 2. gold coin; hence, 3. money; riches; wealth. 4. the bright yellow color of the metal. 5. something regarded as having any of the qualities of gold, as great value, luster, splendor, etc.: as, his voice is pure *gold*.

two for *newspaper* (988-9):

> 1. a publication regularly printed and distributed, usually daily or weekly, containing news, opinions, advertisements, and other items of general interest. 2. newsprint.

and five for *steel* (1427):

> 1. a hard, tough metal composed of iron alloyed with various small percentages of carbon ... 2. a particular kind of steel [depending on carbon content]. 3. a piece of steel; something made of steel; specifically, a) [Poetic] a sword or dagger. b) a piece of steel used with flint for making sparks. c) a steel strip used for stiffening, as in a corset. d) a roughened steel rod used as a knife sharpener. 4. Great strength or hardness: as, sinews of *steel*. 5. *often in pl.* the market price of shares in a steel-making company ...

This means that if words have descriptional meanings, then what they denote on an occasion of use is an exclusive disjunction of their descriptional senses. But the problem is more than the ambiguity that is inevitable if terms are descriptional and have a number of distinct senses. Massive ambiguity is merely computationally awkward. The problem is that the number of kinds distinguishable by human societies depends only on the human imagination, and consequently, there appears to be no limit to the number of possible kinds a term might name. Since languages tend to have a limited lexicon of basic, word-level expressions, there appears to be no principled limit to what, in context, a word may be rationally used to refer to. Thus, *lemon* can also be rationally and unremarkably used to refer to the wood of the lemon tree, as in (2a), to the flavor of the juice of the fruit (2b), to the oil from the peel of the fruit (2c), to an object which has the color of the fruit (2d), to something the size of the fruit (2e), and to a substance with the flavor of the fruit (2f). I stop here only because this example is getting boring.

(2) a. Lemon has an attractive grain, much finer than beech or cherry.
b. I prefer the `74 because the `73 has a lemon aftertaste.
c. Lemon will not penetrate as fast as linseed.
d. The lemon is too stretchy, but the coral has a snag in it.
e. Shape the dough into little lemons, and let rise.
f. Two scoops of lemon, please, and one of Rocky Road.

Similarly, *newspaper* can be rationally and unremarkably used to refer to, among other things, the corporation which publishes a news publication (3a), a copy of the publication (3b), an issue of the publication (3c), the building where the pub-

lication is manufactured (3d), the editorial staff which puts together the content of the publication (3e), and a representative of the corporation (e.g., a reporter) (3f).

(3) a. The newspaper agreed to extend the contract another year.
b. Be careful not to spill your coffee on my newspaper.
c. Yesterday's newspaper identified the gunman as Frank Tsem, but the editor promised to run a correction today.
d. There is a picket line outside the newspaper.
e. The newspaper criticized the state for being unresponsive to the needs of the people.
f. The newspaper missed her train, but will be here by noon.

The problem of polysemy is that it is in principle UNLIMITED. Suppose that artifact terms are descriptional. This entails that artifact terms have extensions that are strictly delimited in clearly expressible ways. Yet, as has been demonstrated (and could be demonstrated ad nauseam), words are typically used to denote an almost limitless variety of kinds of objects or functions: *program* unremarkably refers to a plan, a schedule, a curriculum or course of study, a set of courses, a list of instructions for a computational device, a written representation of any of these, a show broadcast on radio or TV, and potentially to a person responsible (in any relevant sense) for any of these.

(4) a. The program of this group is to subvert the youth of America.
b. Their program calls for 10 pushups three times a day.
c. She entered the program in 1977.
d. We are expanding our program with the addition of two new faculty members, and six new courses.
e. The program would not execute.
f. The programs are all smudged.
g. If you have a VCR you can tape your programs while you are at work or asleep.
h. The program just called and said she would be late.

While an argument can perhaps be made[7] that (4h) represents a metaphorical extension of the 'sense' of program, and should be accounted for by some special mechanism, no such claim is plausible for (4a-g). There are two options open to descriptionalists: either the meaning of any content word is vague enough to encompass all of its uses/senses — this has been the claim of Charles Ruhl for years (cf. Ruhl 1975, 1989)[8] or there is massive, perhaps infinite, polysemy–as many different senses for *program*, *pencil*, *horse* (or whatever) as there are kinds that it would be rational to refer to as programs, pencils, etc. All-embracing vagueness, though minimally descriptional, requires essentially the same apparatus for explaining how reference can succeed as a general nondescriptional account does, so Occam's razor dictates eliminating the minimally functional descriptional part. I am not supposing that speakers have conscious access to representations of the criteria that descriptional meanings would represent, or that descriptions cannot be vague. If the descriptions are not specific

enough to be distinct from each other, then descriptional kind terms will have the same extension, and extensions will contribute nothing to our understanding of reference.

Now, we do not want or need to claim that as language-knowers we keep track of a large, possibly infinite, set of classes of objects (events, situations, relations, properties) that a word could 'denote' or be used to refer to. It is enough to know, Nunberg argues, that our knowledge of how to use language to refer includes the knowledge that if a term can be used to refer to some class X, then it can be used under conditions that he describes to refer to objects describable by a (recognizable) function on X. This principle can be invoked recursively, and applies to functions composed of other functions, and to expressions composed of other expressions, enabling diverse uses like those cited in (2) and (3) to be predicted in a principled manner.

Nunberg (1978a:1-28) presents cogent arguments against indefinite polysemy. If the descriptional meaning of a word is a disjunction of senses, it must be an infinite disjunction. Infinite polysemy would be tractable if it were describable in terms of recursive rules to generate senses from (senses derived from) basic senses. I believe that this is what George Lakoff's 1986 radial approach amounts to, and it is the obvious approach to take if you are committed to the idea that each word in a language is associated with a limited number of meanings as a matter of simple, stipulative fact — as part of the arbitrary conventions that distinguish one language from another. The problem is that it requires basic meanings, and there are two obstacles to accepting that assumption. The first obstacle is that while it is sometimes not too hard to identify word-to-referent relations that are normal in a context, 'normal' represents a social fact about language use, not an arbitrary lexical property of a word. The beliefs that are normal within a community are those that 'constitute the background against which all utterances in that community are rationally made' (Nunberg (1978a:94-5)). What it is normal to use *tack* or *host* or *rock* or *metal* to refer to varies with the community. These are social facts, facts about societies, and only incidentally and contingently and secondarily facts about words. More important, they are facts about what speakers believe other speakers believe about conventions for using words.

Thus, it is normal among field archaeologists to use mesh bound in frames to sift through excavated matter for remnants of material culture, and it is normally believed among them that this is normal, and that it is normal to refer to the sieves as screens. Likewise, among users of personal computers, it is normally believed that the contents of a data file may be inspected by projecting representations of portions of them on an electronic display tube of some sort, and it is normally believed that this belief is normally held, and that it is normal to refer to the display tube as a screen. Whether screen is (intended to be) understood as (normally) referring to a sort of sieve or to a video display depends on assumptions made by speaker and hearer about the assumptions each makes about the other's beliefs, including beliefs about what is normal in a situation of the sort being described, and about what sort of situation (each believes the other believes) is being dis-

cussed at the moment of utterance.[9] This is what is irreducibly social about language use and word meaning.

Nunberg notes a certain social character even in the case of the most unremarkable referents for ordinary terms since, as he remarks, it is plausible to assume that each speaker internalizes the same meaning 'not simply because phenomenological considerations force on him a single characterization of the designated category, but because he assumes these same phenomenological considerations affect other speakers just as they do him' (Nunberg 1978a:87). Naturally, I am uncomfortable calling such sorts of facts 'meaning' and am inclined to say that words do not have meanings, if by meaning is intended a function from words to objects in the world, unmediated by beliefs about users of those words.[10]

The claim that knowledge of how words are used to refer is partly social knowledge (knowledge about social groups) does not entail (despite Putnam's (1975b:227) sensationalism) that '"meanings" just ain't in the head', as long as *meanings* is understood as referring to beliefs according to which words are used to refer. Of course they are 'in the head'. How could they be utilized in reference if they were not?

4. Contextuality — the relativity of normal beliefs

People often perceive the fact that the use of words to refer to things is dependent on users' beliefs about each other's beliefs as inconvenient, and try to circumnavigate it by articulating a theory of meaning that is independent of particular contexts in that it refers to a so-called null context, where speaker and hearer make no assumptions about each other. In fact, however, there are no such null contexts in which utterances could be interpreted. When we are asked to act as informants, and make judgements about expressions or their meanings 'out of context' or 'in a null context', we cannot help but imagine SOME context consisting of a speaker directing that expression as or in an utterance to some audience. We differ, as individuals, and on occasions, in how much context we import into the judgement task, and in what we are willing to imagine when we try to construe the expression as a sensible thing to utter on an occasion of the sort we assume.[11] Consequently, if we abstract away from systems of normal beliefs that inhere in all the various possible groups of users of a language (say, English), we do not arrive at anything that looks much like what we imagine for a notion of either 'normal English user' or 'normal English'. The usage of such a 'normal user', depending on whether we abstracted by intersecting or unioning memberships, would either be that of a person who belonged to no subgroups within the English-speaking world (imagine it — a person with no family, no country, no religion, no occupation, no avocations, no ethnic background — it would be the epitome of a social misfit, and we would be saying it represented a normal user), or it would be a person who was a member of every subgroup (a Welsh Kikuyu Catholic Jewish evangelical Christian Muslim Hindu (etc.) needleworker professor literary critic computer hacker multi-sport athlete insurance salesman) and his[12] usage would reflect the sum of all possible usages, and the problem of unlimited polysemy would be staring us in the face again.

The second obstacle is that often there is no principled basis for identifying one 'sense' as more basic or normal than another. For example, as Nunberg (1978a:63-7) has argued, there is no way to decide whether the basic sense of *window* denotes a kind of hole in a wall, or the framed apparatus that goes in the hole (this is what window salesmen sell), or the usually transparent material that is part of that apparatus (the part you refer to when you say that someone's home run broke a window). Does *newspaper* denote a token of a kind of regularly published document, or one of the types to which such a token belongs? In general, it is not obvious whether the count sense or the mass sense of terms like *fire* or *night* is best treated as the basic sense. Indeed, it is not even evident whether the type use of common count nouns like *cat* is more basic than the token use, or vice versa.[13]

Nunberg's solution[14] (or my interpretation of it) to the problem posed by the relativity of 'normal' reference and the arbitrariness of determining a normal referent in contexts where assumptions about normal states and beliefs do not affect the determination is to say that if you treat relations among referential possibilities as relations between uses, not relations between senses, then there is no need to identify a central, basic sense or use, AS LONG AS THE SPEAKER JUDGES ACCURATELY WHAT IS A NORMAL USE IN THAT CONTEXT, (i.e., what the 'local' NAME for that class, situation, property or whatever is), and as long as any referring function that relates the intended referent to the OSTENSIBLE referent is sufficiently salient from the context, however defined. Nunberg 1978a elaborates on both of these criteria in some detail. The bottom line is that the contribution of individual kind terms to sentence semantics is treated as a matter of reference, something ultimately indexical. Thus there is no need to make any distinction between natural kind terms and artifact terms. Kind terms are just names for kinds, and as with proper names, it does not make sense to talk about their meaning. As I have argued elsewhere (Green 1983:6-7, Green 1996b), natural kind terms are essential to compositional semantics in the same way as proper nouns and indexical expressions like pronouns; they can be used to refer, to point to a particular individual or kind. But it is just as nonsensical to give a semantic analysis of the word *raccoon* or *pencil* as it would be to do it for *Fred* or *Pontiac*. Inferences, including inferences of set relations, may be derivable from the USE of the term, but they are inferences about the sets, not about the words. As with names, there are no linguistic limits on what sorts of things kind terms can be used successfully to refer to. Kind terms, in this account, are words that name kinds of entities, properties or actions, and include most common nouns, most verbs that take concrete arguments, most prepositions, and many adjectives, but I will only be concerned here with terms for kinds of objects.

A nondescriptional account of kind-term meaning amounts to the fact that if terms like *gorilla* mean anything at all, it is just 'is a gorilla' or 'belongs to a category sometimes called 'gorilla', but it does not say what it means to BE a gorilla. A language user could go her whole life without ever considering the question, blithely carrying on conversations about flesh-and-blood gorillas, two- and three-

dimensional images of gorillas, gorilla embryos, gorilla fur, gorilla meat, and large, very intimidating human beings.

5. The achievement of reference

The theory of how words with such an impoverished sort of semantics can be used to refer relatively effectively to only a subset of referents from among all the classes of possible referents depends on a somewhat less impoverished account of the social nature of 'word meaning': knowing what a person means to refer to when she uses a word involves a Gricean regressus. It would not be enough to know 'what a word means' since any word can be used without anomaly to refer to so many different sorts of things. Nor is it enough to know that people (or certain people, namely those we are talking with) are disposed to use certain terms with certain classes of referents in mind, because, if we have accurate knowledge of their disposition, that will not guarantee a unique class of possible referents in a context either. We have to say, as Nunberg does, that on an occasion of use, when someone predicates some property p of some class described as q, we guess at what (our interlocutor thinks we will guess[15]) he means to refer to by q when he is speaking to us about it having property p. That we guess with a fair degree of accuracy is testimony to our sensitivity, but we guess wrong occasionally, and surely more often than we realize. In general, we do not recognize how often we mistakenly attribute our own beliefs to other people, and how often we consequently misinterpret what they say. This fact follows from the universal belief that people are rational — i.e., act purposefully, together with the (universal?) belief that in the absence of specific reason to believe otherwise, other members of our species are just like us.

In addition to assumptions about what uses are normal in which contexts, speakers have access to a number of REFERRING FUNCTIONS (strictly: partial functions) of the sort mentioned above, such as 'type of', 'token of', 'possessor of', 'location of', 'work of', and to a (presumably infinite) number of composites of these functions (e.g., 'location of possessor of', as in Chicago beat Dallas, 44-0). These simple and composite functions relate classes of potential referents, and they can do this even when reference is indicated ostensively — by pointing — rather than by the employment of linguistic expressions. Thus, a truck farmer could point to a bowl of creamed spinach, or a picture of a spinach salad to answer the question, 'What are you going to plant on the north forty next spring?' He does not communicate that he is going to plant bowls of creamed spinach, or photographs of spinach, or cooked or cut spinach, but forms of spinach suitable for planting (seeds or seedlings), by virtue of a referring function like 'source of' or 'source of image of'. Referring functions enable speakers to use terms to denote several kinds simultaneously, as in a sentence like (5), where being herbivorous is predicated of a species, but tipping over the garbage is predicated of a few unspecified individuals.

(5) Raccoons, which are herbivorous, tipped over our garbage can last night.

In the following excerpt from Barbara Tuchman's *The Guns of August*, implicit and explicit references to Belgium denote successively a place, a nation or people, and a government (Tuchman 1962:135).

> Belgium, where [*place*] there occurred one of the rare appearances of the hero in history was lifted above herself [*nation, people*] by the uncomplicated conscience of her [*nation, people*] King and, faced with the choice to acquiesce or resist, took less than three hours to make her [*government*] decision, knowing it might be mortal.

Assuming that normal beliefs license uses which we may call normal within a speech community is not tantamount to assuming a core meaning or extension, for two reasons. First, a normal use is just a use that is rational (i.e., reasonable to expect to be correctly interpreted directly) given normal beliefs. Consequently, a single term (like *cat*) may have several normal uses (e.g., 'type', 'token') within a single homogeneous speech community. They can all be normal, and none of them needs to be more core or basic than any others. Normal uses serve the same grounding function for reference transfer/sense extending that people assume basic senses serve, but it is not necessary to posit 'basic meanings' for this purpose to be served.

This leaves us with a picture in which a word can be used to refer to anything which can be related by one of these functions, or a composite of them, to something normally named by that word in some (sub)community. This amounts to saying that a particular word might be used to refer to almost anything at all. Supposing that there are a finite number of basic relations (even a smallish number, like 100 or 1000), the fact that referring functions can be composed of these (recursively) means that an unlimited number of things can be referred to. Strictly speaking, it does not follow from the fact that there is no mathematical limit to the things you could use that word to refer to, that you could use any word to refer to anything at all, but the spirit of the Humpty-Dumpty problem[16] – whether a word can mean whatever a speaker arbitrarily intends it to mean – persists in either case. Nevertheless, the view presented here is not as anarchic or Humpty-Dumptian as it sounds, because rationality severely limits what a speaker is likely to use a term to refer to in a given context. By this I mean only that people assume that people's actions are goal-directed, so that any act will be assumed to have been performed for a reason. This is a universal normal belief in Nunberg's terminology — everyone believes it and believes that everyone believes it (cf. Green 1993). The consequence of this for communicative acts is that people intend and expect that interpreters will attribute particular intentions to them, so consideration of just what intention will be attributed to speech actions must enter into rational utterance planning (cf. Green 1993, also Sperber & Wilson 1986). This is the Gricean foundation of this theory (cf. also Neale 1992). In the context of word usage, when a speaker rationally uses a word *w* to refer to some intended referent A, she must assume that the addressee will consider it rational to use *w* to refer to A in that context. She must assume that if she and her addressee do not in fact have the same assumptions about what beliefs are normal in the community-

at-large, and in every relevant subgroup, at least the addressee will be able to infer what relevant beliefs the speaker imputes to the addressee, or expects the addressee to impute to the speaker, and so on, in order to infer the intended referent.

One might imagine simpler accounts than this. But by the time they are fleshed out to accommodate the facts outlined above, it is not clear that they will in fact be any simpler. Accounts that suppose a single common shared meaning for each non-homophonous word in anticipation of adopting Nunbergian referring functions will still have to have a principled way of determining whether type or token meanings, and mass or count meanings are more basic. Accounts that suppose a single meaning for each term so vague that the distinction between mass and count, type and token does not arise must find some principled way of predicting the regularity of mappings among uses on concrete occasions that was sketched above. It is hard to see how functions could apply to something so vague and have this effect. Accounts that opt for polysemy will have to come up with principled means for determining just what meanings each word in 'the' language 'has'. It is not clear that this is possible, in practice, much as dictionary makers may try to draw a line between metaphor and 'meaning' or to characterize all of the unremarkable possible uses of words.[17]

No doubt I have made communication sound very difficult to effect, and very fragile. I do not doubt that we are generally less successful at it than we think we are, but in general, we are not conscious of the work that is required, and I do not think it is all that fragile. Believing in the convenient fiction that words 'mean things'[18] is what makes it seem effortless for us to use them to try to communicate. If we were aware of how much interpretation we depended on each other to do to understand us, we might hesitate to speak. The inferencing that constructing or understanding an utterance requires (cf. Green 1982) is comparable to the inferencing we do in resolving structural or lexical ambiguity, or inferring reference or conversational implicature, and indeed, involves the same principles for inference. Fortunately for us, it is work we are not aware of doing. For example, if we write something like *Shape the mixture into walnuts* in a meatball recipe, we must be assuming that our readers will not consider it rational for us to be referring to their making real walnuts by molding a mixture of ground meat, egg, and cracker crumbs. If we attribute to the addressee as a normal belief the assumption that uncooked meatballs are normally between, say, one-half inch and two and a half inches in diameter, then it is rational for us to expect him to find the referring function from an object to objects the size and/or shape of that object salient enough to infer that by referring to walnuts in that context, we intend to communicate that he should form meatballs the size he identifies with unshelled walnuts. And even if we attribute this belief incorrectly, we assume that the addressee will be able to correctly identify the belief we incorrectly attributed to him, and correctly identify the referring function 'size of'.

Without the assumption that achieving reference requires inferences about your interlocutor's beliefs about your beliefs (etc.) about what beliefs and uses are normal in the context, we would have a genuinely Humpty-Dumptian situation: people would consider it normal to use any word for any thing any time at

all. Everyone would always be in the position we find ourselves in when we try to interpret text like these paragraphs from an article in the *Chicago Tribune* written to illustrate all the different senses documented over the centuries for the word *shamble(s)*:

> She rested her feet on a shamble. Then she went out shopping, first stopping to look at a shamble in a department store before going on to buy meat for dinner at a shambles. The meat had arrived that morning fresh from the shambles.
>
> She bought a newspaper, which described the dreadful shambles after a battle in Bosnia. Then she returned home, found her dog had knocked over a vase, and thought, 'What a shambles!'

Even if we know that *shamble(s)* might be used to refer to a footstool, a counter for displaying goods, a meat market, a slaughterhouse, a scene of carnage, or just any kind of mess, it is difficult to tell with any confidence which sense is intended for which use, and infuriating to discover that it changes with each use! This shows how dependent we are in normal situations on using assumptions about (the speaker's assumptions about our assumptions about) the context to interpret what is meant by what is said.

When a speaker uses a kind term like *jazz*[19] or *snow*, that term will be intended to rigidly designate whatever the speaker expects to be understood as intending to refer to, and it will be understood as rigidly designating whatever the hearer believes it was intended to be understood as referring to, that is, as invoking its name, or the name of the class to which it belongs, without characterizing it or its class. To say that a term designates rigidly is to claim that the term picks out the same referent in all worlds where that referent exists. So *horse* or *snow* or *jazz* refers to whatever in a world counts as a *horse*, *snow*, or *jazz* IN THAT WORLD. As long as terms are names which rigidly designate the kinds which are their intended referents, the criteria for being a horse, being snow, or being jazz do not enter into the designation relationship directly. Thus, in any world, *horses* can be used to refer to whatever entities in any world$_i$ people in some world$_j$ would call horses in that world$_i$, REGARDLESS of whether the counterparts of those entities in other worlds would be called horses in the other worlds. Thus, the size, scale, and uses of the animals are not the criteria which solely affect which ones can be successfully referred to as horses when or where; from our$_j$ point of view (indexing speakers and referents to worlds), Eohippus is a horse$_i$ with respect to early Tertiary$_i$ times, but not with respect to periods since the great ice age$_j$.[20] From an Eocene point of view, horses$_j$ are a lot bigger than they$_i$ used to be.

Of course, not all words rigidly designate the entities they are used to refer to. For example, there are non-rigid designators like *pope*, which designates whoever is the titular head of the Roman Catholic Church at a contextually indicated time. In addition, I want to make it clear that I am not claiming that no words ever have descriptional meanings. Some words have, in additional to an unlimited number of uses related by referring functions to other uses, a sense which describes criteria for class membership just as a descriptive phrase like *gray sweater*

indicates a referent by limiting it to something which is gray and a sweater. For example, *orphan* indicates a child whose parents are dead, and *kill* refers to causing a change of state from alive to dead. The motivation for the claim that *orphan* is descriptional, but *horse* is not, is that a horse with three legs which is not used for carrying or drawing loads is still a horse, but an orphan whose parents are brought back to life is not an orphan anymore. Putnam's (1962:65-70) 'one-criterion' words (like *bachelor* or *renate* ('kidney-having') or *cordate* ('heart-having') surely have descriptional senses, as do all the words that are inherently relational. Examples like *kill* and *orphan* are just the tip of the iceberg; Barker & Dowty 1993 discuss several classes of relational nouns, including boundary words like *top*, *side*, *inside*, *outside*, *border*, *tip* (but not *iceberg*), part-denoting words like *hand*, *whisker*, *root*, *wheel*, *chapter*, and terms referring to socially significant relations, such as *friend*, *enemy*, *sister*, *citizen*. Of course, some words, like not, *every*, *if* and *and* do not refer at all, and contribute to the semantics of an expression syncategorematically, as operators, according to rules of combination. Still others (like *heck*, *hello*, *um*) do not even contribute to the truth conditions of an expression, but only to the pragmatics, the calculation of what is to be inferred from what was said. The question at hand is: to which category do terms for artifacts like *pencil*, *pasta*, and *steel* belong?

6. Some objections to treating artifact terms as nondescriptional

Three sorts of objections may be made (as for example, by Abbott 1989) to the claim that artifact terms are non-descriptional.

6.1 Objection 1: 'Artifact terms describe function and external structure, because this is visible'

The first one is that, contrary to Putnam's opinion, Putnamian Twin-Earth thought experiments 1) distinguish between natural and artifactual kinds, and 2) show that names for artifacts are descriptional. Abbott, for example, agrees with Putnam that entities that looked and acted like cats but were really robots would only count as robots, but reports the intuition that genetically reproduced organisms that could be exploited like pencils would just BE pencils. (I think I would be inclined to say that they were fruits (or creatures) that are used like pencils. If Twin Earthlings call them pencils, that is mere coincidence, since on this history of Twin Earth, there are no artifactual pencils.)

Abbott (1989:281) speculates that external appearance and function are the denotation-determining criteria for artifactual kind terms:[21]

> Artifacts are typically made by humans and are categorized according to their purposes, so we know how they are shaped and what they are used for. When it comes time to name them we have the reference-determining properties there at hand, we know what we are talking about. It is only in the case of nature's species that we have observable kinds whose real essence is mysterious, and so only in that case must we leave the reference-determining properties open.

Thus, the gist of this sort of argument seems to be: we cannot tell what the membership criteria are for biological kinds by direct inspection, so they cannot be part of the meaning of natural kind terms. We can tell what the criteria are for artifacts, so they must be part of the meaning of artifact terms.

There are several problems with the conclusion that function and external appearance determine the denotation of artifact terms, and with this sort of rationale for it. First of all, people's knowledge of the appearance and function of potential referents of terms they use is independent of their linguistic knowledge of those terms. Following the external structure and function account, a person who does not know that a pearl is a natural object has an incorrect grammar, because he has the wrong sort of semantics for *pearl*, and his grammar should change when he discovers that pearls are not man-made like beads are. While not knowing whether something is man-made (or robot-made) and another is a product of nature[22] may result in a foolish claim, it does not affect our ability to use words to refer. The position that the semantics of words for natural kinds is of a different sort from the semantics of words for artifactual kinds because natural kinds are different from artifacts entails that the words *rice* and *orzo* (a rice-shaped pasta) have different semantic relations to their referents, and that someone who does not know that orzo is manufactured (or that rice is a grain) has a different grammar from someone who is better informed. The word pearl would have to have a different kind of semantics depending on whether its intended referent is (assumed to be) natural or artificial. This alleged distinction does not seem to contribute anything to our understanding of words as they are used. If I tell you that I am looking for a yarn swift, your ability to tell that there is something I want, that I do not have, that is called a yarn swift, does not seem to be impaired by your not knowing whether yarn swifts are a natural kind or a kind of artifact, nor would it be significantly improved by your learning that *yarn swift* is a descriptional (or nondescriptional) term.

Second, external appearance is in fact a poor criterion for kind membership, for both natural and artifactual kinds. Whales and dolphins look like fish; bats look like birds; sharks, which are fish, look like dolphins. Indeed, the literature on the acquisition of kind terms indicates that children as young as three years of age ignore appearance when it conflicts with claims of category membership (Gelman & Markman 1987).

One can also take issue with the notion that artifact terms are defined by their exostructure, appearance and function. Yuppie catalogs of recent years display desk telephones that look like Mickey Mouse, like footballs, and like sneakers, so it cannot be their exostructure or appearance that identifies them as telephones. Often the way they work is disguised; the dials or keypads are not exposed, and the handset (what a peculiar term!) is just a detachable portion of the 'sculpture'. Yet, it is enough for someone to tell you that one of these things is a telephone, for you to have a belief that you can use it for what you use telephones for. You do not have to believe it has a dial or a keypad OR a handset to do this. It could be a speaker-phone; it could do speech-recognition dialing.

The purpose an artifact serves is no better a criterion for the extension of artifact terms. Cordless phones and cellular phones are telephones, but their function will not distinguish them from 2-way radios.[23] Yet ordinary people consider them telephones, and maintain the same expectations about communications on cordless and cellular phones as about more conventional telephones, in spite of high court opinions to the contrary.

Finally, the assumption of descriptionality for artifact terms is inconsistent with the (Nunbergian) observations cited in section 3 that the reference of a term on an occasion of use is determined by (speakers') beliefs about (others') beliefs. Descriptionality entails either fixed references (basic meanings), or unbounded polysemy, or both, and we have reviewed the reasons for rejecting both.

6.2 Objection 2: 'Multiple functions allow artifact terms to have multiple essences, unlike natural kind terms'

A second argument against analyzing artifact terms as being non-descriptional (cf. Abbott 1989:281-2) also seems to depend on the premise that if artifacts are different from natural kinds 'in kind of essence' (Abbott 1989:282), then artifact TERMS must be essentially different from natural kind TERMS. It assumes that the essential properties of artifacts do not involve internal structure, but rather function, and cites the existence of artifacts that can be used for multiple purposes, like a high-chair that folds down to a play table, or a cane that flips out to serve as a stool, as evidence that unlike natural kind terms, artifact terms are defined by the function of the artifact. However, it is not the case that a highchair/playtable just IS a highchair when it is being used as one, and just IS a playtable when it is used that way. It is always a dual-purpose object, even if it can only be used for one purpose at a time. Of course, there is a referring function that gives the illusion that these multiple purpose objects have multiple identifications or 'essences'. This is the functional equivalence of particular classes of objects and other objects that serve the same relevant purpose. This function is commonly exploited in metaphors like those in (6), and even less remarkably used when we refer to these dual-purpose objects sometimes as highchairs or playtables simpliciter, and indeed, in sometimes classifying them for particular purposes as highchairs or as playtables.

(6) a. You can use a newspaper to keep your head dry when it sprinkles, but this sort of umbrella is no use in a Midwestern gully-washer.

b. In Dickens' novel about the French Revolution, Mme. LaFarge knitted a catalogue of crimes against the people into the shawl she was making.

It must be clear that I am not committed to identifying (members of) natural or artificial kinds across or within worlds by reference to unrelativized essential properties. I am not certain whether others intend the expression *essential properties* referentially or attributively in discussing the views of Kripke and Putnam (cf. also Section 2, and Abbott 1989:287-8), but I have found no reason to believe that when speakers identify some individual as sufficiently like an X to be

called by the same name, that they all do it according to the same criteria (cf. also footnote 20 (Gould quote)). Thus, quibbling over whether exostructure and function are as essential for determining category membership is doubly beside the point.

6.3 Objection 3: 'Children distinguish between artificial kinds and natural kinds'

A third argument raised by Abbott (1989:282-3) that artifact terms do not 'express essential properties' (277, 287-8) is that the work of Keil 1986 shows that by the age of 10, and often as early as 7, children treat manipulation of appearance as changing the category of manufactured objects (like birdfeeders or coffeepots), but not of natural kinds (like skunks and raccoons), although kindergarteners do not reliably make the distinction. In fact, this observation only shows that older children know that there is a difference between certain types of natural and unnatural KINDS, and can correctly categorize certain kinds. Indeed, further work by Springer & Keil 1989, 1991 shows that the chief conceptual division accessed by experiments of the sort Keil reports is not between natural kinds and artificial kinds, but between biological natural kinds, and everything else. As they put it, '...preschoolers consistently distinguish between heritable and non-heritable features, claiming that only features influencing parents' biological functioning are passed on to offspring.' Consequently, if we were to draw conclusions for natural language semantics from the controlled investigations of young children's abilities to classify objects, we would have to say that the words *skunk* and *raccoon* (or *flower* and *dog*) are in one class, while *water*, *pencil*, and *island* are in the other. In any case, I see no reason to take Keil's experiments as showing that the terms for the two sorts of kinds (whatever they may be) indicate their referents differently.

Throughout the arguments for a descriptional account of artifact terms runs the assumption that there is a privileged and transparent relation between artifacts and the terms used to refer to them, that it is obvious what artifact terms are supposed to be terms for, or, if they are descriptional, that it is obvious what they are supposed to describe. But the question, 'Do artifact terms express essential properties?' raises another question: properties of what? The very terms *natural kind term* and *artifact term* presuppose basic senses and basic extensions, i.e., they presuppose that there is some natural or artificial kind that that term refers to in a privileged way, so that *lemon*, by its nature[24] refers to a fruit, not to a piece of candy or a poorly manufactured automobile. Yet, it is easily demonstrated (cf. also Sec. 4 above) that identifying 'the basic sense' of such a term is problematic, to put it mildly. To take another example, even if we agree that *the Constitution* is an artifact term, it is not evident whether it refers to a document signed at some point in history and perhaps amended many times since then, or to the laws that the signing (and amending) of that document enacted. With the assumption of descriptional meaning, if it cannot be determined what a term denotes, then it is not possible to say whether terms for artifacts express essential properties of the objects they describe.

If it is assumed that the classification of referents as species occuring in nature or not is significant in determining the mode of referring of the term, such claims are false, because terms for both kinds of species are unremarkably used to refer to both kinds of objects. *Lemon* can refer to a natural tree, its natural fruit, or the natural flavor of the oil or juice of its fruit–or to the processed wood of the tree, or any manufactured object that resembles the fruit. (When *pine* refers to plywood or lumber, is it a natural kind term, or an artifact term? When *the governor's office* is used to refer to the governor, is it an artifact term, or a natural kind term?) Is *coffee* a natural kind term or an artifact term? Insofar as the answer depends on whether the speaker intends to refer to a growing plant, its roasted fruit, or a beverage brewed from ground particles of the roasted fruit, then the classification of words into natural kind terms and artificial kind terms is at the very least, pointless.

7. A nondescriptional lexicon

What if kind terms generally (both so-called natural kind terms and so-called artifact terms) are nondescriptional names? We should no more expect terms to name unique kinds than we expect personal names to name unique individuals. I know lots of Susans and Bobs; maybe you know lots of Scotts and Jennifers. In 1989 there were two Jeff Georges in Champaign, and in 1990, two Keith Joneses in the NFL, two Eddie Johnsons in the NBA, and two Jennifer Coles and two Carol Tennys in linguistics. It is really quite unremarkable. But if we say that kind terms are names for kinds, parallel to personal names, we do not need to say that what kind they name is a semantic property of a lexical form (Green 1983, Kripke 1972). Lexical representations would detail underlying phonological forms, syntactic category, morphological irregularities, and subcategorization:

PHONOLOGY /lɛmɔn/
CATEGORY noun
PLURAL-MORPHOLOGY regular
SPR <(Det)>

This is grammatical information. The fact that English speakers use *lemon* to refer to all sorts of kinds that are related directly or indirectly to the fruit of the *citrus limonum* is a cultural fact about language users, like the fact that there are social implications of using certain specific words in certain situations TO REFER TO THEIR NORMAL REFERENTS. Referring to a correctional institution as *the slammer* or *the joint* implies a certain familiarity that using *jail* or *prison* lacks; not saying *please* when making a request implicates a different kind of familiarity (Green 1990, 1992). But these are not facts about a semantic correspondence between the word and the world.

This means, to put it bluntly, that grammars do not associate denotata with words. Indeed, if kind terms are names for kinds, then since the kinds which a term can be taken to name are indefinitely variable, and in general, no single kind is logically prior to all others named by the same term, and the relation between a kind name and which kind it is intended to refer to on an occasion of use is a matter of inferring a speaker's referential intentions, it is not sensible to say that the

mapping from words to kinds is a property of the individual words. Then how, one might ask, do we know what the words mean? First of all, this is the wrong question. To paraphrase a cliche, words do not mean things, people mean things. And everything follows from this. (This is not a new idea. It is Paul Grice's story, and Geoff Nunberg's, and in some ways, Sperber and Wilson's. I am just retelling it.) As described in Section 2, when someone speaks, generally, and when she uses a certain word, in particular, we assume that she meant something by it. If we (presume that we) are the addressee, we presume that she believed we would know, or be able to figure out by virtue of our knowledge of what is normal in various contexts and of the sorts of referring functions available, what she intended us to understand by it. As long as she abides by this social contract and considers what we are likely to take a word to be-generally-taken-to-name-in-that-context,[25] there will be no problem.

If all the classes of potential kinds of referents are not going to be enumerated (listed in lexical entries for words) or described via a descriptional meaning, how is the diversity of potential referenda to be accounted for? Probably a genuinely radical pragmaticist would derive part of speech as well as kind of intended referent from context and a theory of relevance (Grice 1975, Sperber & Wilson 1986, Green 1990),[26] but it is hardly radical to propose that pragmatic competence includes knowledge of regular correlations between sorts of intended referents. The correlations that I am thinking of are not to be understood as lexical rules; they do not expand the lexicon, because, according to the view of lexical meaning I have sketched, information about properties of the referent (of a USE) of a term is not information that is in the lexicon, because it is infomation about the USE of a term. Such rules however, may entail shifts in syntactic properties, where those properties correspond to properties of referents. (This is a really thorny issue, broached in Nunberg 1993 with respect to deixis and indexicality.) Thus, in addition to rules like (7), which maps from count noun uses to count noun uses, there must be rules like (8), which map between the count and mass uses of a term.

(7) If a name can be rationally used to designate a product, it can be rationally used to designate the source of that product, and vice-versa.

	PRODUCT	SOURCE
NATURAL KIND	lemon [fruit]	lemon [tree]
ARTIFACT	newspaper [copy]	newspaper [corporation]
PROPER NAME	Picasso [print]	Picasso [artist]

(8) If a name can be rationally used to designate an individuated object, it can be rationally used to designate a substance derived from that object, and vice-versa.

	OBJECT	SUBSTANCE
NATURAL KIND	pine [tree]	pine [lumber]
	chicken [bird]	chicken [meat]
ARTIFACT	newspaper [copy]	newspaper [=newsprint]
	marker [pen]	marker [ink]
PROPER NAME	Shakespeare [author]	Shakespeare [opus]

Rules like (8) are necessary because they interact with determiner selection; whether a noun subcategorizes for a determiner or for no determiner is a function of the type of the referent, whether it is a mass or an individuated object (cf. Wierzbicka 1988). Principles like (7) and (8) are parallel to the cognitive capacity for deferred reference, which we have seen to be not specifically linguistic (recall the discussion of deferred gestural reference to spinach seeds by pointing to an image of prepared spinach leaves in Sec. 5). At the same time, they seem to be at least partially independent of the rules for indexicals, which appear to be quite a bit more complicated (cf. Jackendoff 1992, Nunberg 1993).

There are also category-changing rules (apparently language-specific) like (9) and (10), which derive denominal verbs and deverbal nouns, respectively.

(9) If a word can be rationally used to designate an object or substance, it can be rationally used as a verb to designate a situation (event, process, or state) in which an object that can be rationally designated by that word plays a role. (Cf. Clark & Clark 1979)

	OBJECT	SITUATION
PROPER NAME	Willie Horton	Willie Horton (an opponent)
NATURAL KIND	milk	milk (a source)
	elbow	elbow (a person)
	water	water (drinks; plots of land)
ARTIFACT	trumpet	trumpet (a communication)
	bread	bread (a portion of uncooked food)
	bug	bug (a location)

(10) If a word can be used rationally as a verb to designate a situation-type, it can also be rationally used as a count noun to designate that situation-type.

EXAMPLES: run [intransitive]
capture [transitive]
kick [transitive or intransitive]
kiss
lack [transitive]
look [COMPS <AP>] or [COMPS <PP>]

Notice that rule (9) applies equally to proper names (cf. also *Oliver North*, *George Bush*, *Dan Quayle*), natural kind terms (cf. also *sugar*, *lead*, *salt*, *pepper*, *hound*, *ape*, *parrot*, *eyeball*), and artifact terms (cf. also *ring*, *glue*, *saddle*, *lace*), and that all such rules, but especially rules like (10) will be constrained in practice by familiarity with existent forms that are used to denote terms in the range of the function, according to now familiar 'blocking' principles (cf. McCawley 1978, Horn 1984, 1989).

Among the questions that have barely begun to be explored are ones concerning exactly how many of these rules a language or culture has, and exactly what their relation is to the referring functions, which being cognitive in nature are presumably the product of a universal capacity. Obviously, in other languages

or cultures, these rules might entail morphological embellishment that a morphologically underprivileged language like English does not have. Although the inventory of linguistically reflected referring functions is cross-linguistically quite robust (Nunberg 1978a), Jackendoff 1992 observes that some pairs of interpretations of nouns act differently from others with respect to binding phenomena, and Nunberg 1993 discusses a wealth of issues involving agreement and pronominal reference that arise from the possibility of both deferred reference and predicate transferral. It may be too early to say exactly what kinds of mappings exist between lexical rules and cognitive relations, how much is conventionalized from general, causal principles and how much redundancy an optimal model of our abilities encodes.[27] These are questions we might not have been led to ask if we accepted the claim that only natural kind terms were non-descriptional.

My purpose has been to challenge the notion that terms for artifacts are different linguistically (semantically and pragmatically) from terms for natural kinds. I have argued that Nunberg's arguments against polysemy taken together with his arguments against fixed basic meanings hold equally for the multiplicity of unremarkable uses for natural kind terms and artifact terms, and argue that both are linguistically no more analyzable than proper names.

NOTES

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[2] Perhaps as originally ostensively indicated — Abbott (1989: 286) rightly distinguishes commitment to the causal theory of reference from the phenomenon of nondescriptionality or rigid designation.

[3] In taking the position that the generally accepted analysis of so-called natural kind terms does not extend to artifacts, which she describes as a conservative position, Abbott (1989:269, 271, 287) aligns herself with Kripke (1989:271), implying that Kripke would severely limit the assignment of nondescriptionality. However, she admits that 'it is somewhat difficult to tell' (Abbott 1989:270) [the extent, in Kripke's view, of the nondescriptional class of words], and the passage she cites as 'Kripke's clearest statement' (Abbott 1989:270) shows only that he is cautious, not that he is 'conservative'(Kripke 1972:327):

> ...my argument implicitly concludes that certain general terms, those for natural kinds have a greater kinship with proper names than is

> generally realized. This conclusion holds for certain for various species names, whether they are count nouns, such as 'cat', 'tiger', 'chunk of gold', or mass terms such as 'gold', 'water', 'iron pyrites'. It also applies to certain terms for natural phenomena, such as 'heat', 'light', 'sound', 'lightning', and presumably, suitably elaborated, to corresponding adjectives — 'hot', 'loud', 'red'.

Kripke does not say that other terms are not like proper nouns in the relevant respects.

[4] Abbott considers this a nondescriptional account, saying that her account of natural kind terms as expressing the 'essential properties' of the kind (1989:277) is not descriptional in that the property expression it attributes to natural kind terms 'is the minimal one of being of such-and-such a kind, e.g., being a tiger, or being gold, whatever that entails' (1989:287-8 (fn. 6)).

[5] Kripke (1972:284) rightly criticizes an account of this sort that he attributes to Kneale.

[6] This section interprets and elaborates on arguments given originally in Nunberg 1978a.

[7] The argument is not worth pursuing, however, insofar as it is impossible to draw a principled line between (poetic) metaphor and meaning (cf. Nunberg 1978b), without invoking the notion of novelty, which involves an evaluation (by the speaker) of evaluation by the hearer, and is thus a matter of language use, not of lexical meaning. I find compelling the arguments of Nunberg 1978a that the same principles account for both (poetic) metaphor and what many take to be ordinary polysemy.

[8] Thus, he would derive all of the use possibilities of *bear* and *hit* (but not *kick* (Ruhl 1989:225)) from unique meanings, though he admits that he cannot represent those meanings (1989:63):

> So what does *bear* mean? It should be clear by now that this question cannot be answered in words; there is no single word or phrase that can comprehensively capture exactly what *bear* contributes.

[9] Nunberg 1978a gives numerous examples of this.

[10] I certainly would not want to say that a meaning is a function from a word to its denotation on an occasion of use, because that would conflate meaning and reference, and claim that, e.g., there was no difference between a 'literal use' like (i) and a metaphorical use like (ii).

[i.] They waltzed through the room.
[ii.] They waltzed through the calculus exam.

[11] Cf. Schmerling 1978, Green 1993.

[12] Or her, if you like; the mind boggles at imagining the sex and gender of such an individual.

[13] This does not mean that only they are genuinely ambiguous. There is no empirical support for saying that *window* and *fire* are ambiguous because we cannot say that one use is more basic than all the others, but that *lemon* is vague because all the uses can be derived from a single salient use; ambiguity tests (Zwicky & Sadock 1975) treat both types as ambiguous, not vague. Example (i) cannot refer to a fruit in one clause and a piece of candy in the other, and (ii) cannot refer to an individuated fire in the first instance and the phenomenon fire in the second.

[i.] Kim bought a lemon and Sandy did too.
[ii.] Some fire is beneficial and some isn't.

[14] This account is greatly abbreviated and somewhat oversimplified, of course. For fuller discussion the reader is referred to Nunberg 1978a and to the summary and commentary in Green 1996a.

[15] The recursion goes as deep as necessary, but usually there is no need to go deeper than one or two cycles, if that many.

[16] 'When *I* use a word,' Humpty Dumpty said, in rather a scornful tone, 'it means just what I choose it to mean – neither more nor less.' (Carroll 1960:229).

[17] Pilot studies of twenty or so 200-word passages of unremarkable prose show that from 8-29 percent of the nouns, verbs, and adjectives are used in ways not characterized by large desk dictionaries. Cf. also Nunberg 1978b.

[18] What kind of things, I have always wondered. Cf. Austin 1963. There is a lot in this article that seems way ahead of its time (it was written in 1940) – e.g., characterization of what amounts to implicature, as distinct from implication; discussion of the consequences of regular polysemous usages (amounting to referring functions). Naturally, I reject Austin's dismissal (1963:7) of the idea that it is reasonable to treat common nouns as names for kinds. Austin objected to this idea on the grounds that while proper names are names of real individuals, if the designatum of a common noun is considered to be a kind, it is not a real thing, because kinds are fictitious entities. Insofar as there are proper nouns for 'fictitious individuals' like Santa Claus and Satan, fictitiousness of the (intended) referent is not a distinctive property of common nouns. He also supposes that common nouns have connotation while proper nouns do not, and that this is also a good reason to reject the idea that common nouns might be logically names. If all the things that we believe to be (commonly believed to be) true of the individuals that we take proper names to denote amount to connotations, then having connotations or not does not distinguish between common and proper nouns either. That we can use proper nouns as common nouns as in sentences like (i) points to parallel modes of determining reference.

i. I'll trade you three Jose Cansecos for a Bobby Bonilla.
ii. Even the casual visitor to the Windy City discovers that there are many Chicagos.

The fact that proper nouns can be used as verbs (to denote a characteristic property of the individual (normally taken to be) named by the noun, as in (iii) just as common nouns are (as in (iv)) corroborates this judgement.

iii. The strategy they adopted for the next four years was to Willie Horton their opponents into a defensive position.
iv. They trumpeted their discoveries from every pulpit available.

For more examples, see Section 7.

[19] An enlightening discussion of this is to be found in Nunberg (1978a:81-6).

[20] Pedants may object to my use of the name *Eohippus* for a species properly called *Hyracotherium* (Gould 1991:90), but as it would be genuinely pedantic for me to use that name when I have no confidence that it would be meaningful to more than a few readers, I use what we must perhaps now take to be the common name of this species. It is interesting that the usage of Gould (a paleontologist) is to use *Eohippus* when discussing older works that call the critter *Eohippus*, and *Hyracotherium* when discussing the beast itself.

[21] Experts are not so certain that natural kinds are so observable. Cf. Gould (1985:93-4): 'Nature, in some respects, comes to us as continua, not as discrete objects with clear boundaries. One of nature's many continua extends from colonies at one end to organisms at the other. Even the basic terms — organism and colony – have no precise and unambiguous definitions. ... Some cases will be impossible to call – as a property of nature, not an imperfection of knowledge.'

[22] Only the inventor of an artifact could be depended on to have this knowledge. If it is granted that the nature and status of terms in the language shared by members of the community therefore depends on the knowledge of a specific individual, advocates of desdriptional meaning for artifact terms must find their own stories to tell about the consequences of positing Putnamian experts: Putnam's 'division of linguistic labor' entails that knowledge of language is societal, not individual, and contra Abbott (1988:286), requires commitment to a causal theory of reference.

[23] Malt 1992 offers controlled demonstrations that function is not a reliable clue to category membership as reflected in referential practice.

[24] To some extent, the research on categorization inspired by Rosch 1973 and Rosch et al. 1976 may provide a way of narrowing the likely domain of a term in uses presented out of context, since if a term (like *chair*) can be understood as the name of a basic level category, it will be natural to interpret it (out of context) as naming that basic-level category. However, this really provides very little help either in any particular circumstance, because language interpretation is not carried on out of context even in contrived experiments (cf. Sec. 3.3 above), or in general, because most terms (including *lemon* and *pencil*) do not name basic-level categories, and this principle gives us no guidance for them. Nunberg (1978a:29-47) gives some principles which not only cover a considerably broader domain, but are considerably more specific, and are framed under a set of assumptions

which does not presuppose a privileged, linguistically specified denotation. My point here is simply that what class a term denotes is not a question that can be insightfully answered out of context by reference to arbitrary grammatical stipulations.

[25] Of course, it is more complex than this. Often she must consider what I am likely to take her to assume I am likely to take it to (be taken to) name. In principle there is no limit to the depth of recursion here. See Nunberg 1978a:82-116, Green 1989:56-61.

[26] See Russell 1993 for some details on how this would work.

[27] Cf. Sadock 1983, Green 1985.

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CONDITIONING FACTORS FOR PROGRESSIVE AND REGRESSIVE NASAL HARMONY*

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The results of a survey of nasal harmonies triggered by nasal consonants argue for independent conditioning factors for progressive and regressive nasal harmony. Specifically, the only condition on a consonantal trigger of progressive nasal harmony is that it be released into a vowel, while triggers of regressive harmony should mark the right edge of a boundary. Schourup's 1973 survey of local nasal to vowel assimilation suggests that similar conditioning factors govern local perseverative and anticipatory nasal assimilation. Several motivations for the conditioning factors are considered, and tentative phonetic reasons are outlined.

1. Introduction

This paper explores the relation between the context of a nasal consonant, and the direction of the nasal harmony it triggers. Specifically this paper considers whether the consonantal triggers of progressive and regressive nasal harmony favor different contexts, and if they do, whether the same correlations can be observed in local nasal to vowel assimilation.

Previous generalizations about the directionality of nasal assimilation do not suggest a connection between local assimilation and long distance harmony. In her survey of the feature nasal, Cohn (1993:159) makes the following observation:

> ...it is less common for long distance spreading to occur with anticipatory thanprogressive nasalization. Only four cases out of the 61 cases of anticipatory nasalization invole spreading in a domain larger than a segment: whereas 11 of the 30 cases of progressive nasalization involve such spreading.

Not only do the numbers that Cohn gives suggest that there are more progressive harmonies than regressive harmonies total, but they also indicate that the percentage of progressive assimilations that are long distance is higher, especially as the total number of anticipatory assimilations is twice that of progressive assimilations. Therefore, long distance harmony appears to favor the progressive direction.

For local assimilation, Cohn's numbers suggest that anticipatory nasal to vowel assimilation is more common than progressive nasal to vowel assimilation. This coincides with Ferguson's (1975:181) statement: 'Nasality may spread either

regressively or progressively from a nasal consonant to a neighboring vowel, but regressive spread is more common.'

A preliminary conclusion might be that local nasal to vowel assimilation and long distance nasal harmony have nothing in common with respect to their likely directionality: without considering any other factor, local nasal to vowel assimilation is more likely to be anticipatory while nasal harmony triggered by a consonant is more likely to be progressive. However, there are other factors to consider, namely the context of the triggering nasal. When this factor is considered, common generalizations about directionality in local nasal to vowel assimilation and nasal harmony emerge.

The first generalization is that in both local and long distance nasal assimilation processes, a nasal consonant that is released into a vowel is more likely to trigger progressive assimilation than regressive assimilation, and that this is equally true regardless of the position within the word this prevocalic nasal occupies. For example, being in word initial position does not appear to increase the likelihood of triggering progressive harmony. One result of this is that intervocalic triggers which might be expected to trigger either progressive or regressive harmony, usually trigger progressive harmony.

The second generalization is that for both local and long distance nasal assimilation, the likelihood that a nasal consonant will trigger regressive assimilation is increased when that triggering consonant is at the right edge of some kind of boundary (e.g., at the end of a syllable, a morpheme, or a word). For example, a nasal in coda position is more likely to trigger regressive assimilation by virtue of marking the right edge of a syllable.

The first goal of this paper is to establish the generalizations stated above by comparing a survey of nasal harmonies to a survey of local nasal to vowel assimilations. Section 2 describes the results of a survey of nasal harmonies with consonantal triggers which I conducted, while section 3 reviews Schourup's 1973 survey of local nasal to vowel assimilation. Both surveys confirm the described generalizations. For both regressive nasal harmony and anticipatory nasal to vowel assimilation, there is an implicational hierarchy of contextual restrictions on triggers: intervocalic triggers in a regressive assimilation imply the presence of syllable final and word final triggers, but syllable and word final triggers do not imply the presence of intervocalic triggers in regressive nasal assimilation. This suggests that the act of marking the right edge of a syllable or word boundary somehow promotes regressive nasal assimilation from a consonantal trigger. No similar hierarchy is observed for the contextual restrictions on triggers of progressive nasal harmony and perseverative nasal assimilation. This suggests that the condition of being released into a vowel is the only factor which induces a nasal consonant to trigger progressive assimilation.

The second goal of this paper is to consider possible explanations for the two generalizations. Section 4 considers and rejects phonological-representational accounts. The autosegmental treatment of feature harmony (exemplified in Piggott 1992) does not predict a correlation between the context of a trigger and

the direction of harmony. Although the Optimal Domains Theory treatment of feature harmony (described in Cole & Kisseberth 1994, 1995 a and b) allows expression of the correlation, it also allows the expression of correlations which don't exist so the observed correlation must be stipulated. Section 5 explores the possibility that the correlation logically follows from the nature of nasal harmony itself, but no simple logical explanation is found. Finally Section 6 looks to the phonetic aspects of nasalization for an explanation. Tentative articulatory and acoustic motivations are outlined for the generalizations established in this paper.

2. Survey of Nasal Harmonies

The appendix contains data from nine languages which display nasal harmony triggered by a consonant. For convenience, the results are summarized in table (1). For each nasal harmony in the survey, the table indicates whether triggers are found in a particular context, those contexts being word final, before another consonant, intervocalic, word initial, and after another consonant.[1]

(1) Summary of Survey Results:

		Context of trigger					
Language	Direction	N#	NC	VNV	#N	CN	examples
Capanahua	regressive	✔	✔	✔			cipõnki , bĭmi
English	regressive	✔	✔				rãĩm , hɛ̃lən
Ijo	regressive	✔	✔				kɔ̃rɔ̃ŋmbɔ
Maxakali	regressive	✔	✔				ʃõwə̃n , ãmbĭk
Arabela	progressive			✔	✔		nɛ̃ɛ̃nũʔ ,kanããgeʔ
Land	progressive			✔	✔		mãlu , umɔ̃
Malay	progressive			✔	✔		nãhũ , enãʔ
Sundanese	progressive			✔	✔		ɲhãk , gumədə
Warao	progressive			✔	✔		nãõ , inãwãhã

The most striking result from the summary in (1) is that intervocalic triggers are predominantly found in progressive harmonies. In fact every progressive harmony exhibits intervocalic triggers, but only the regressive harmony in Capanahua has intervocalic triggers, and even in this language the numbers of word final and preconsonantal triggers are much higher. In other words, a regressive harmony might have intervocalic triggers, but only if it also has word final and preconsonantal triggers, while regressive harmonies can have word final and preconsonantal triggers without having intervocalic triggers. No parallel restrictions or implications are found among progressive harmonies.[2]

My interpretation of these observations is that there is something about nasal consonants that are released into a vowel which makes them good triggers for progressive harmony, and that whatever this quality is, it applies equally to

all prevocalic consonants regardless of their position in a word. This would explain why there is no implicational hierarchy among the contextual restrictions on triggers of progressive harmony. Every prevocalic nasal consonant carries the progressive harmony promoting characteristic to an equivalent degree, so no prevocalic nasal consonant is more likely to trigger progressive harmony than any other prevocalic nasal consonant.

Some independent characteristic of nasal consonants which mark the right edge of a boundary make them good triggers for regressive harmony. I propose that if other nasal consonants trigger regressive harmony, they do so only to achieve phonological symmetry as discussed by Hayes 1996. This proposal predicts the implicational restrictions on triggers of regressive harmony, and the overall rarity of intervocalic regressive harmony triggers.

3. Survey of Local Assimilation

Similar generalizations can be made about local nasal to vowel assimilation if we consider the results of Schourup's 1973 survey. The inventory Schourup gives of the contexts for vowels undergoing local nasal assimilation is shown in (2).

(2) **environments for regressive nasalization:**
__N# just word final (3 languages)
__N$ just syllable final (1 language)
__NC(spec) before a specific class of consonants (3 languages.)
__N#, __NC(spec.) word final or before a specific class of consonants (2 languages)
__N#, __NC word final or before all consonants (5 languages.)
__N before all nasals (4 languages)

BUT NEVER
__NV just before prevocalic nasals

environments for progressive nasalization:
N__ after all nasals (11 languages)
N(spec)__after a specific nasal (2 languages)
N(spec)__# after a specific nasal word finally (3 languages)

An examination of the contexts for regressive assimilation shows implicational restrictions on the trigger which are similar to those found in triggers for long distance harmony. Namely, a regressive assimilation may have intervocalic triggers but only if it also has word final and syllable final triggers. In fact regressive assimilations that have only word final or syllable final triggers are much more common. For progressive assimilation on the other hand, there is no preference for word initial triggers. The only cases where a prevocalic trigger of progressive harmony is in any way restricted is when the trigger must have a certain place, or where the target vowel must be word final, but not where the trigger must be in a certain position.

Articulatory data from Krakow 1993 support the generalizations made about anticipatory nasal to vowel assimilation. In a study comparing the relative timing

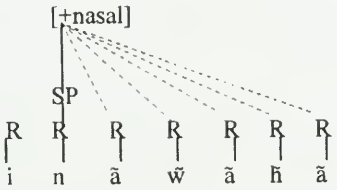
of lip movements and velum movements during the production of intervocalic nasal bilabial consonants, Krakow 1993 found that when the consonant is a coda (e.g., the [m] in 'home E'), velic lowering begins as the lip starts to rise for the bilabial closure. In contrast, when the nasal consonant is in an onset (like the [m] in 'hoe me'), the velic lowering begins as the lip completes its rise. This confirms that at least in English, anticipatory nasalization is greater if the trigger consonant marks the end of a syllable boundary.

To summarize, both the survey of long distance nasal harmony and Schourup's 1973 survey of local nasal to vowel assimilation find similar conditioning factors on consonantal triggers. On the one hand, all prevocalic nasal consonants are equally likely to trigger progressive assimilation, indicating that the only conditioning factor for a trigger of progressive assimilation is that it be released into a vowel. On the other hand, triggers of regressive assimilation fall into an implicational hierarchy: nasal consonants which mark the right edge of boundary, trigger regressive assimilation before other nasal consonants. This indicates that the conditioning factor for triggers of regressive assimilation is that they mark the right edge of a boundary. At this point the question arises as to why these two factors should condition progressive and regressive nasal assimilation respectively. The next three sections explore possible answers to this question.

4. Phonological-Representational Accounts

Current phonological-representational treatments of feature harmony can't account for the generalizations in a satisfactory way. The autosegmental analysis of feature harmony as spread of association lines from an underlying feature specification on the trigger has no account for the tendency for intervocalic nasals to trigger progressive harmony. There is nothing in the representation which would predict that it should be more preferable to spread in one direction over the other. The diagram in (3) shows progressive nasal harmony in Warao as resulting from the spread of association lines from a [+nasal] specification on an intervocalic nasal consonant to the right, but given the representation in (3), the association lines could just as easily have spread to the left. The fact that they don't must be stipulated.

(3) Autosegmental account of nasal spread in Warao as seen in Piggott 1992.



In contrast, the Optimal Domains Theory of feature harmony can at least express the correlation. Optimal Domains Theory (as described in Cole & Kisseberth 1994, 1995a, b) treats feature harmony as occuring when feature domains

have wide scope, which in turn results when alignment constraints require the edges of feature domains to be aligned with the edges of prosodic or morphological domains. So for example, progressive nasal harmony would result if alignment constraints requiring the right edge of a nasal domain to be aligned to the right edge of a word outranked the constraints requiring it to be aligned to the right edge of the triggering segment. Therefore Optimal Domains Theory could express the correlation between trigger context and the direction of harmony by positing constraints requiring the edge of the trigger aligned to the feature domain to also be aligned with a syllable boundary. This is shown in (4) where the tendency for intervocalic nasal consonants to trigger progressive harmony is expressed by a constraint requiring that the left edge of a Nasal Domain be aligned to the left edge of a syllable boundary.

(4) Constraint: Align (Nasal Domain, left, syllable, left)

(i) [(nã)(w̃ã)(ñã)] : '[ ]' mark the Nasal Doman, '( )' mark syllables.

However, the fact that progressive harmony shows no preference for word initial triggers while regressive harmony does would have to be stipulated. Furthermore, any similar patterning in local nasal assimilation would be accidental because Optimal Domains Theory doesn't address local assimilation. Finally, it might not be appropriate to approach these generalizations with any Optimality Theoretic account as the generalizations describe cross-linguistics tendencies. Optimality Theory (Prince & Smolensky 1993) handles crosslinguistic variation by changing constraint rankings, so to handle a crosslinguistic tendency, one must make statements about preferred rankings. This could be done, but the question as to why the ranking is preferred would still be left unanswered.

5. Possible Logical Explanation

It might be the case that the tendency for intervocalic nasal consonants to trigger progressive harmony follows logically from the very nature of nasal harmony. Homer 1998 argues that nasal harmony is non-neutralizing. It follows that nasal harmony from a consonantal trigger should spread in the direction of a compatible segment which, if it were to undergo nasalization, would not have to change so much as to neutralize a contrast. This predicts that the most likely target would be a vowel because vowels can nasalize easily with a minimal impact on their contrastive properties.[3] Given the assumption that harmony should spread towards a vowel, it follows logically that a trigger preceded by a consonant will spread progressively, a trigger followed by a consonant would spread regressively, but an intervocalic trigger could still spread either way. These conclusions are summarized in (5).

(5) Logical conclusions assuming that nasal harmony spreads towards vowel:

- CN triggers will spread rightward.
- NC triggers will spread leftward.
- VNV triggers can spread either way.

The prevalence of intervocalic nasals triggering progressive harmony is not explained by this line of reasoning. Another option is to propose the functional argument that in order to be detected, harmony should spread into the word.

This predicts that word initial triggers should spread progressively, and that word final triggers should spread regressively, but predicts nothing about word medial triggers. These conclusions are summarized in (6).

(6) Logical conclusions assuming that nasal harmony spreads into the word:

- #N triggers will spread rightward.
- N# triggers will spread leftward.
- # ... N... # triggers can spread either way.

One might argue that word medial triggers just pattern after the more default word initial or word final triggers to achieve phonological symmetry, but in this case one should expect some harmonies that have only word initial consonantal triggers. None are found among the nine nasal harmonies surveyed in this paper.

6. Phonetic Reasons

There are possible articulatory reasons for the connection between syllable final triggers and anticipatory nasalization. According to Bell-Berti 1993, it's likely that raising the velum involves active muscular contraction, while lowering the velum results from passive muscular relaxation, so one might expect the nasal to oral transition to be quicker than the oral to nasal transition.[4] This predicts that in general, anticipatory nasalization is more common. Krakow 1989, cited in Bell-Berti (1993:80) finds that coda nasals achieve a lower velic position than onsets. This might predict that codas in general make better triggers for nasalization than onsets. Putting these two pieces together, one might reach the conclusion that codas are better triggers for nasal assimilation, and that they're more likely to assimilate regressively.

The articulatory evidence presented thus far makes no prediction about progressive nasal assimilation. However there may be perceptual reasons for prevocalic nasals to trigger progressive assimilation. In a perceptual test involving synthesized vowels, Stevens 1985 found that the nasal consonant in a nasal-vowel sequence where nasality was extended 100 msec into the vowel was more readily identified as nasal than when nasality was only extended 50 msec into the vowel. Hence it appears that extending nasalization into the following vowel aids in the identification of the consonant as nasal, as opposed to an obstruent.

7. Conclusion

In conclusion, there appear to be independent factors which condition progressive assimilation and regressive assimilation from a nasal consonant. Being released into a vowel conditions progressive assimilation from a nasal consonant, while marking the right edge of a boundary conditions regressive assimilation from a nasal consonant. These conditioning factors are active in both local and long distance assimilation, and result in different contextual restrictions for the triggers of progressive and regressive nasal assimilation. These conditioning factors are not accounted for by phonological-representational treatments of feature harmony, nor do they logically follow from any inherent properties of nasal harmony. There are articulatory reasons to expect regressive assimilation in general to be more prevalent, and for coda nasals to be better triggers. There are per-

ceptual reasons for nasal consonants released into a vowel to trigger progressive assimilation. However, it is still not clear why regressive harmony should be conditioned when a nasal consonant marks the right edge of a boundary: the articulatory evidence presented here suggests that codas make better triggers for both regressive and progressive assimilation.

One other question that remains is why the progressive direction is preferred for long distance harmony, while the regressive direction is preferred for local assimilation. To answer this question requires a more complete understanding of the different natures of local and long distance assimilation than is currently within our grasp. However if we assume that long distance harmony is a higher level, or more 'phonologized' phenomenon than local assimilation, then the beginning of an answer can be found in the results of experiments described in Kawasaki 1986. Kawasaki 1986 finds that nasal vowels are more easily perceived as nasal when in a context where they would not typically receive contextual nasalization. If anticipatory local nasalization is more common, perhaps vowels following nasals are more easily identified as being nasal so phonologization into harmony from local progressive assimilation is more likely. This assumes that a crucial step in the development of a long distance nasal harmony from local nasal assimilation is that the speaker-hearer actually recognizes the vowel as being nasal.

NOTES

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[1] Although I've included included Capanahua and Ijo as languages with word final consonantal triggers, an examination of the data shows that none of the forms in either language actually surface with a nasal consonant at the end of the word. Descriptions of both languages propose underlying word final consonants that trigger anticipatory nasalization, and then delete. While stated in synchronic terms, these descriptions are probably accurate reflections of historical developments in both languages, so even though the word final consonantal triggers have since disappeared, they were the original source of harmony emanating from the end of the word.

[2] The absence of triggers preceded by a consonant (i.e., in the CN context) most likely is not significant. It might be the case that the CN sequence itself is rare, so there just aren't any CN nasals around that can trigger harmony.

[3] Homer 1998 discusses an apparent exception to this statement: in Applecross Gaelic, nasalization reduces the number of height contrasts among vowels, so mid-high vowels block nasal harmony in order to preserve height contrasts. However, when compared to consonants, it is easier to preserve contrasts on vowels under nasalization.

[4] Using auditory reasons, Bladon 1986 reaches the same conclusion. Bladon argues that the vowel to nasal consonant transition is less salient than the nasal consonant to vowel transition because the first type of transition involves 'spectral offset'. As a result, the vowel to nasal consonant is more susceptible to 'auditory temporal smear' and therefore anticipatory assimilation is more likely.

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APPENDIX

A. Data from Capanahua (Loos 1969, Piggott 1992, van der Hulst & Smith 1982, Safir 1982, Walker 1994):

From word final nasal that deletes:

/waran/	[warã]	'squash'	/poyan/	[põỹã]	'arm'
/bawin/	[bãw̃ĩ]	'catfish'	/ciʔin/	[cĩʔĩ]	'by fire'
/boon/	[bõõ]	'hair'			

From word medial nasal before a glide that deletes, then nasal spreads right:

/wiranẅi/	[wirãw̃ĩ]	'push it over'
/hisyaʃaʔnẅi/	[hisaʃãʔw̃ĩ]	'see sometime'

From word medial nasal that remains:

cipõnki	'downriver'	kĩnča	'bowl'	kãncĩ(n)	'banana'
bĩmi	'fruit'	bãnawi	'plant it'	ñãmawi	'step on it'
ñãmãʔõna	'coming stepping'			wirãnai	'I pushed it'

B. Data from English (Schourup 1973):

r̃ãim	'rhyme'	fjũm	'fume'	ñɛ̃lən	'Helen'
ñãlr̃ŋ	'hollering'	klɛ̃r̃ə̃ts	'Clarence'	riw̃ãĩr̃ĩŋ	'rewiring'

C. Data from Ijo (Williamson 1987, Piggott 1992):

(Piggott (1992:42-43) proposes an underlying word final nasal that deletes for Ijo and for another Nigerian language, Urhobo.)

bɛ̃i	'be full'	õw̃ɛ̃i	'bite'	õỹãỹã	'horse'
ỹãr̃i	'shake'	ɛ̃r̃ɛ̃i	'day'		
kɔ̃r̃ɔ̃ŋmbɔ:	'thin'	ĩndaa	'how many'		
ãnda	'wrestle'	õmgbɔ	'seed'		
ũmbu	'navel'	õŋgɔ	'riches'		

D. Data from Maxakali (Gudschinsky, Popovich, & Popovich 1970)

(It appears that Maxakali also exhibits progressive nasal harmony. The data shown here are selected to demonstrate the regressive harmony only) :

pʲiitʲnãŋ 'frog species'	ʃõw̃ãn'to open'	kõmɛ̃n	'city'
tõmããn 'tomato'	mãỹõw̃ãn 'sun'	pĩŋən 'noise made by jumping'	
mĩhĩɛ̃m 'wood, tree'	ʔɛ̃ʔɛ̃ɛ̃m'who'		
ʔãmbiʷi 'needle'	ʔãmbik'cook'	ʔãmbĩi 'wind'	hãɛ̃mpʃoëbay 'a good thing'

E. Data from Arabela (Rich 1963):

nãxeʔ	'his father'	nããnᵈriʔ	'type of demon'
nãĩʔ	'stinging ant'	nĩnỹũʔ	'to come'
nũwãʔ	'partridge'	nỹæ̃æ̃riʔ	'he laid it down'
nãsexeritiʔ	'did he say it'	nĩtyænũʔ	'to carry on the back'
nĩỹẽnõʔ	'he is coming'	nẽẽnũʔ	'to turn over'
nẽỹætuʔ	'daughter'	nũnũnũʔ	'light beaming'
mỹæ̃nũ	'swallow'	mwĩræt:tyenũʔ	'cause to be seen'
mãn:teʔ	'moth'	mãũʔ	'mushroom'
mõnũʔ	'to kill'	mããnũʔ	'woodpecker'
ɦãnũʔ	'to fly'	ɦỹũũʃ:ʃænõʔ	'where I fished'
ɦũwãʔ	'a yellow bird'	ɦĩỹæ̃nĩʔ	'old woman'

kanããgeʔ	'our father'	pokonãgiʔ	'yellow'
papanʌ̃ɦãʔ	'hollow'	keronĩʔ	'deep'
komʌ̃ɦĩʔ	'over there'	karʌ̃k:koɦwãʔ	'type of owl'
tinỹãkariʔ	'afternoon'	rupoɦõnũʔ	'to stick together'

F. Data from Land Dayak (Schourup 1973, Kenstowicz & Kisseberth 1979):

nĩɦĩn	'place'	nãɦãn	'bear'	nãjũn	'swing'
nũwãŋ	'pour'	nãbur	'sow'	nũʔã:n	'open'
ɲĩjũm	'kiss'	mãlu	'strike'	mẽʔãn	'eat'
ənãk	'child'	siŋãũ	'cat'	kiñãm	'feeling'
pəmĩŋ	'dizzy'	simĩɦĩŋ	'ten'	umõ	'water'
pimãjĩn	'a game'				
ntakadn	'taste'	mpahit	'send'	sunɔk	'in need of'
suŋkoi	'cooked rice'	sampɛ:	'extending to'		

G. Data from Malay (Teoh 1988, Piggott 1992):

ñãwãh 'soul, spirit'	nãhũ 'grammar'	nĩyõ: 'coconut'
nĩyãt 'wish'	ñãñĩ 'to sing'	nãʔẽʔ 'to ascend'
nãŋkë 'jack fruit'	nãmpaʔ 'to see'	ŋãŋã 'agape'
nãnti 'to wait'	mãhãl 'expensive'	mĩnõm 'to drink'
mãwãs 'type of monkey'	mĩnõmãn 'drinks'	mãʔẽn 'to play'
mãhãsiswa'undergraduate'	mãkan 'to eat'	mãkanãn 'food'
mẽŋãyãʔ 'to sift'	mãʔãp 'forgive'	mãti 'to die'
mẽwãh 'prosperous'	mãyãŋ 'stalk (palm)'	mãyãt 'corpse'
mãmpu 'affordable'	mãndi 'to bathe'	mĩŋgu 'week'
mẽŋkuaŋ 'a species of grass'		mẽndoŋ 'overcast'

këñsuñĩyãn'stillness'	bënũã 'continent'	istanẽ 'palace'
binãsë 'destruction'	binãtaŋ 'animal'	enãʔ 'delightful'
sëmpurnẽ 'complete'	baŋõn 'to rise'	suŋãĩ 'river'
uŋũ 'purple'	këbi:mbaŋãn 'anxiety'	
pësamãmãʔãn 'the same'	ramãĩ 'numerous'	kemõt 'crumpled'

ëmãʔ 'mother' elmũ 'knowledge' laksëmãnẽ' admiral'
ilmĩyãh 'scientific' sëmũẽ 'all'

guri:ndam'type of poetry' to:mbaŋ 'to fall'
ba:ŋgë 'to be proud'

H. Data from Sundanese (Anderson 1972, Piggott 1992, Cohn 1990):

ɲĩãr 'seek' ɲãũr 'say' ɲãĩãn 'wet'
ɲãhõ 'know' ɲãʃãtkin 'dry' nũhũrkin 'dry'
nuʃũs 'dry' ŋãtur 'arrange' nĩʃĩs 'relax in a cool place'
ŋũdag 'pursue' ŋĩsər 'displace' ŋũliat 'stretch'
ŋĩwat 'elope' ŋãjak 'sift' ŋãluhuran 'to be in a high position'
ŋõbah 'change' mĩʃãsih 'love' mãro 'to halve'
mãhãl 'expensive' mãrios 'examine' mĩhãk 'take sides'

biŋhãr 'to be rich' kumãhã 'how?' gumə̃de 'to be big'
dumĩhĩs 'to approach' pinãŋgih 'to find'

I. Data from Warao (Osborn 1966, Piggott 1992):

nãõ 'come' mõãũ 'give it to him'
mõyõ 'cormorant' mẽhõkohi 'shadow'

inãwãhã 'summer' honĩwãku 'turtle'

no codas allowed (Osborn 1966)

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VOWEL INTERACTION IN BASQUE: A NEARLY EXHAUSTIVE CATALOGUE*

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The treatment of vowel sequences in Basque inflectional morphology has played a prominent role in discussions of rule interaction, literally becoming a textbook example of extrinsic rule ordering (cf. de Rijk 1970, Kenstowicz & Kisseberth 1979:176-7, Kenstowicz 1994:21-2, 126-7, Lakoff 1993, Kirchner 1997, Trask 1996:92-3). However, perhaps because of the incomplete sources, the facts are often misrepresented. Thus Kenstowicz & Kisseberth 1979 mix facts from different dialects and Trask's 1996 'conservative Bizkaian', which he uses to illustrate rule reordering, is purely fictional. In addition, the incompleteness of the data that are presented can be misleading. The reader may conclude that no other possibilities are found (or could be found). This is enough reason to justify the compilation of facts that we undertake in this paper. Another important reason, of course, is that as a consequence of the difusion of standard Basque much of the existing diversity in the treatment of vowel sequences in Basque can be expected to disappear in the near future. It is thus important to document these facts in an easily available source.

1. Attested patterns

Inflected singular and plural forms arose historically by the affixation of the distal demonstrative *(h)a(r)*: **gizon (h)a(r)* 'that man' > *gizona* 'the man'. This origin is obvious when we compare, for instance, dative forms such as *gizonari* 'to the man' and *gizon (h)ari* 'to that man' (see Michelena 1977:218, 1981). Other demonstratives have also developed into suffixes. In this paper we will focus on the absolutive singular, which is the citation form. The basic shape of the absolutive singular suffix is *-a*, added to the uninflected stem, as in *gizon* 'man', *gizona* 'the man'.:[1]

The vowel sequences resulting from suffixation of the singular determiner to stems ending in different vowels have undergone a great number of different changes in different areas. Thus, the absolutive singular of, for instance, a stem ending in *-o*, such as *beso* 'arm', may be *besoa, besua, besue, besu*, etc. depending on the variety. A nearly exhaustive catalog of the patterns that have been documented for the absolutive singular is given in Table I. Each pattern is identi-

fied by a representative variety. The output for each of the historical (or, if one wishes, 'underlying') sequences resulting from affixing the singular determiner *-a* to stems ending in each of the five vowels is listed in a separate column (The sound represented as *-y-* may range from a glide, to a voiced nonstrident palatal fricative [ʝ] to a voiced palatal stop [ɟ], depending on the variety, similarly /-b-/ may be a stop [b] or an approximant [β])

Table 1: Treatment of vowel sequences in the absolutive singular

	a + a	e + a	o + a	i + a	u + a
1. Standard Basque	a	ea	oa	ia	ua
2. Literary Bizkaian	ea	ea	oa	ia	ua
3. Arratia	ea	ea	oa	ie	ue
4. Getxo	e	e	o	i	u
5. 18th cent Markina	ia	ia	ua	iža	uba
6. Lekeitio/Deba	ia	ia	ua	iža/iša	ua
7. Bermeo	ie	ie	ue	iže	ue
8. Gernika	ie	ie	oa	iže	ue
9. Elantxobe	i	i	u	iže	u
10. Larrauri	ia	ia	oa	iže	ue
11. Errezil	ia	ia	ua	i	u
12. Urdiain	ia	ia	ua	i(y)a	u(b)a
13. Zumaia	aa	ia	ua	iša	ua
14. Zarautz	a	ia	ua	iya	ua
15. Alegia	a	ea	oa	ie	ue
16. Etxarri	a	ie	ue	iye	ube
17. Lizarraga	a	i̯e	u̯e	iye	ube
18. Ultzama	a	i̯a	u̯a	ie	ue
19. Basaburua	a	ii	o̯a	ii	uu
20. Beruete	a	ee	o̯a	ii	uu
21. Baztan	a	i̯a	u̯a	i̯e	u̯e
22. Aezkoa	a	e̯a	o̯a	i̯a	u̯a
23. Zaraitzu	ara	e̯a	o̯a	i̯a	u̯a
24. Erronkari	á	e̯a	o̯a	i̯a	i̯a
25. Zuberoa	á	ia	ua	ia	ia
26. Sara	a	i̯a	u̯a	ia	ua
27. Beskoitze	a	i̯a	u̯a	ia	uya (üa, ia)
28. Arbona	a	i̯a	ua	ia	ua
29. Aiherra	a	i̯a	u̯a	i̯a	i̯a

The patterns in Table I are roughly organized in terms of geographical distribution. On the basis of the treatment of vowel sequences, we can establish the following major dialectal groups (see Map 1):

A. Western dialects (mostly Bizkaian): Types 2-12 (those which present reflects of the dissimilation *a + a > ea* . To the west of isogloss 1 on the map).

B. Central dialects (mostly Gipuzkoan): Types 14-16.

C. Navarrese dialects: Types 17-24 (with rising diphthongs. To the east of isogloss 2 on the map)
D. Northern dialects: Types 25-29

Map 1: Basque dialect areas

In section 2, we will first consider the main historical processes which have given rise to the alternations that we find in the different dialects. In section 3, the 29 patterns in Table I will be exemplified and discussed as systems of alternations. Some considerations regarding the spread and retraction of vowel alternations through time and space are presented in section 4.

2. Main sound changes resulting in alternations

2.1 Low Vowel Assimilation

Most Bizkaian, as well as some Gipuzkoan and High Navarrese varieties have acquired a process whereby /a/ is raised to /e/ after a high vowel, with or without intervening consonants.[2] This results in the following alternations between *-a* and *-e* with consonant-final stems:

UNINFLECTED	ABS SG		UNINFLECTED	ABS SG	
gizon	gizona	'man'	lagun	lagune	'friend'
eder	ederra	'beautiful'	mutil	mutile	'boy'
sagar	sagarra	'apple'			

This raising also takes place with stems ending in a high vowel, e.g., *buru/burue* 'head/the head'. In addition, in many dialects this process was acquired after another change raising mid vowels in prevocalic position (Mid Vowel Raising, cf. 2.3.2). In these dialects the effects of Low Vowel Assimilation are also found with stems ending in mid (and even low) vowels: *beso/besue* 'arm/the arm', *seme/semie* 'son/the son'. Nevertheless, there are areas where the order of acquisition of the two processes of Low Vowel Assimilation and Mid Vowel Raising has been the opposite, resulting in more opaque alternations of the type *buru/burue* but *beso/besua*, as in 16 Ultzama and 19 Baztan in Table I.

In rural areas around Azpeitia and Azkoitia in Gipuzkoa, the raising of /a/ by this process produces a distinct vowel [ɛ] or [æ], transcribed as *ä* in dialectological studies, which does not merge with the allophones of /e/ (cf. Yrizar 1991:I. 366).

2.2. *a*-final stems

As mentioned, the affixation of the determiner to vowel-final stems creates vowel sequences which are altered in a number of different ways. Historically, the first change took place in the sequence of identical vowels created by the attachment of the suffix *-a* to *a*-final stems. We find three main developments in the singular of *a*-final stems:

Dissimilation:	aa > ea	neska 'girl' vs. neskea 'the girl' (western)
Contraction:	aa > a	neska 'girl' = 'the girl' (central)
	aa > á	néska 'girl' vs. neská 'the girl' (easternmost area)

In a few localities on the western *-ea* / central *-a* isogloss (e.g., Zumaia) we find the older *-aa* sequence unmodified:

aa neska 'girl' vs. neskaa 'the girl'

The sequence *-ea* has been further altered in many western varieties:

Western developments

	UNINFL/ABS SG
ea > ia	neska / neskia (e.g., Eibar, Lekeitio)
ea > ia > ie	neska / neskie (e.g., Gernika)
ea > ia > ie >i	neska / neski (e.g., Ondarroa)
ea > e	neska / neske (e.g., Getxo)

The dissimilatory change *aa* > *ea* (and further evolutions) is found in all of Bizkaia, in the Basque-speaking area of Araba, in western and southern Gipuzkoa and even in a few towns in the Navarrese Burunda Valley (Zuazo 1995, 1998:197) . This sound change is already present in our first documents for western dialects such as a letter by Fray Juan de Zumarraga dated 1537 (see Sarasola 1990), Landucci's 1562 dictionary, and the anonymous *Refranes y Sentencias* of 1596. The identical sequence created in plural forms such as *neskaak* 'the girls' is, however, not affected in the same manner. In 18th century Markina as well as some present-day varieties, such as Oñati, this sequence is left unchanged and we do indeed find *neskaak*. But the sequence has subsequently been reduced to

neskak almost everywhere. The common western pattern is thus *neska* 'girl', *neskea* 'the girl', *neskak* 'the girls' (all forms are for the absolutive case, unless otherwise indicated). As Michelena 1981 points out, the failure of the dissimilation rule to operate in the plural can be taken as evidence for concluding that the plural determiner became a suffix later than the singular. Some additional evidence for this position is provided by the marked accentual behavior of plural suffixes. In what appears to be the most conservative western accentual system, most words are unaccented and are subject to only phrase-level accentuation on the last syllable; e.g.,: *sagarrá* 'the apple', *neskeá* 'the girl', *sagar ederrá* 'the beautiful apple', *neska ederrá* 'the beautiful girl', *sagar ederra dá* 'it is the beautiful apple'. Clitics, on the other hand, introduce an accent on the preceding syllable; e.g.,: *sagar ederrá be(re)* 'the beautiful apple too'. Plural suffixes behave like clitics in triggering preaccentuation; e.g., *sagárrak* 'the apples', *néskak* 'the girls'.We may thus surmise that at the point the dissimilatory raising of stem-final low vowels took place, the singular determiner was already a suffix, but the plural was only a clitic, with a less intimate link to the stem (cf. Hualde 1993).

In most of the Basque Country, on the other hand, we find a reduction *aa* > *a* in both singular and plural forms; e.g.,: *neska* 'girl; the girl', *neskak* 'the girls'. Interestingly, as mentioned, in some points on the dividing line between the western and the central solution we find the original sequence unchanged.

In the easternmost Zuberoan or Souletin dialect (as well as in the now extinct Roncalese or Erronkari dialect), the contraction of the sequence *-aa* is reflected accentually. In this area, stress is regularly penultimate, as in *gízun* 'man', *gizúna* 'the man'. The contraction of the *aa* sequence has created marked oxytonic words: *neskaa* > *neská* 'the girl' (vs. uninflected *néska* 'girl'), *neskaak* > *neskák* 'the girls'.

Finally, in Salacenco (Zaraitzu), a now obsolescent dialect, an epenthetic *-r-* distinguishes absolutive singular forms such as *alabara* 'the daughter' from uninflected *alaba* 'daughter'.

Everywhere in the case of (nonsingular) suffixes starting with a vowel other than /a/, stem-final *-a* is deleted, as in the standard forms *neskek* 'the girls, erg pl', *neskok* 'the girls abs/erg prox pl', *nesken* 'of the girls, gen pl'.

2.3 *e*-final and *o*-final stems

2.3.1 Neutralization of the contrast between *a*-final and *e*-final stems in western dialects

First of all, we must note that the dissimilatory change *-aa* > *-ea* in western dialects created a neutralization in the singular between *a*-final and *e*-final stems. All subsequent changes have treated the sequence *-ea* in the same way, regardless of whether the uninflected form ends in *-e* or in *-a*. That is, the absolutive singular of *a*-stems and *e*-stems is always identical in western dialects. The different evolutions of *-ea* in western dialects illustrated with *a*-final stems above are also the same for *e*-final stems:

Western developments

	UNINFL/ABS SG
ea > ia	seme / semia, neska / neskia (e.g., Eibar, Lekeitio)
ea >ia > ie	seme / semie, neska / neskie (e.g., Gernika)
ea > ia > ie >i	seme / semi, neska / neski (e.g., Ondarroa)
ea > e	seme / seme, neske / neske (e.g., Getxo)

Since the change *-aa* > *-ea* only took place in the singular, plural forms of *a*-final and *e*-final stems are different. Thus, for instance in Gernika we find *neska/neskie/néskak* 'girl/the girl/the girls' vs. *seme/semie/sémiek* 'son / the son / the sons'. The neutralization between nominal classes is thus found only in the singular (but it has nevertheless triggered the transfer of some words from the *e*-final to the *a*-final class in western varieties; e.g., *lore/lorea* > *lora/lorea* 'flower')

Unlike the change *-ea* > *-aa*, all subsequent changes took place both in the singular and in the plural. Most of these changes are also found outside the western area.

2.3.2 Mid Vowel Raising *ea* > *ia*, *oa* > *ua*

The most common of the changes affecting mid vowels is the raising *ea* > *ia*. Alternations of the type *seme/semia* are found from western dialects like Lekeitio to Zuberoan, the easternmost dialect. In most of the area where *ea* > *ia*, there is a parallel development *oa* > *ua*; e.g.,: *seme/semia* 'son/the son', *beso/besua* 'arm/the arm'. However, in Gernika, where we find *seme/semie*, the sequence *-oa* remains unchanged, *beso/besoa*.

The acquisition of Mid Vowel Raising may or may not result in merger between the sequences corresponding to stems ending in mid and high vowels, depending on whether or not other processes affect stems ending in high vowels (cf. Table I).

In many areas we find the further development *ia* > *ie*, *ua* > *ue*, by Low Vowel Assimilation (cf. 2.1).

2.3.3 Gliding: *ea* > *e̯a*, *i̯a*, *oa* > *o̯a*, *u̯a*

In many Navarrese and Lapurdian varieties stem-final mid vowels lose their syllabicity before the vowel of a suffix and are realized either as nonsyllabic versions of /e/, /o/ or as true glides, often with both options as variants in the same dialect; e.g.,: *seme / seme̯a ~ semi̯a.*

In most of this area the same results are found with stems ending in a high vowel, there are, however, some interesting exceptions (patterns 18 and 26 in Table I), where stem-final mid vowels glide, but stem-final high vowels do not.

2.4 Stems ending in a high vowel

2.4.1 Epenthesis of homorganic consonant: *ia* > *iya* > *iža* > *iša*, *ua* > *uba*

With stems ending in a high front vowel a homorganic transitional glide developed between the stem-final vowel and the initial vowel of a suffix in many

Bizkaian, Gipuzkoan and High Navarrese varieties. This glide was hardened, giving rise to several palatal and prepalatatal consonants:

ia > iya [ija] ~ [iɟa]	mendi / mendiya	(many Gipuzkoan varieties)
ia > iya > iža	mendi / mendiža	(many Bizkaian varieties)
ia > iya > iža > iša	mendi / mendiša	(Deba valley)

A parallel process of epenthesis is found with *u*-final stems, where the resulting epenthetic consonant is generally [-β-], but a stop [-b-] in Arbizu[3] (which contrasts with all other instances of intervocalic /b/, cf. Hualde 1996a). This process has been steadily losing ground during the last century. Whereas a hundred years ago epenthesis with *u*-final stems appears to have been as general as epenthesis with *i*-final stems in Bizkaia, Gipuzkoa and Navarre and was also found in coastal Lapurdian, epenthetic [-β-] has now been lost in most of its former territory or, in some areas, it is found only in the speech of older speakers.

Alternations of the type *mendi/mendiže* 'mountain/the mountain' (as in pattern 7 Bermeo) result from Low Vowel Assimilation.

2.4.2 Epenthesis of non-homorganic consonant: *ua* > *uya*

In some Low Navarrese varieties we find epenthesis of a palatal glide with *u*-final stems. This phenomenon is already found in the first book written in Basque, *Linguae Vasconum Primitiae* by the Low Navarrese Bernard Etxepare [Dechepare] 1545, e.g., *munduya* 'the world'.

2.5 Second Vowel Deletion

In a few northern Bizkaian varieties the vowel [e], and sometimes [a], has been lost in hiatus after another vowel, e.g., *neskie* > *neski* 'the girl'. This has happened in Ondarroa, where now absolutive singular forms differ from the corresponding uninflected forms in the quality of the final vowel, for stems ending in a vowel other than /i/: *béso/besú* 'arm/the arm', *séme/semí* 'son/the son', *néska/neskí* 'girl/the girl'. The process is spreading to Markina and neighboring towns where *besúe* ~ *besú* 'the arm', *semíe* ~ *semí* 'the son', *neskíe* ~ *neskí* 'the girl', etc. are found in stylistic variation (cf. Zubiaur et al. 1992). (With stems ending in /i/ there is epenthesis in this area, e.g.,: *mendixe* 'the mountain').

Final vowels in hiatus have also been lost in Getxo and surrounding area. Since these varieties did not have Mid Vowel Raising, this has resulted in neutralization between uninflected and absolutive singular forms for stems ending in vowels other than /a/: *beso/beso, seme/seme, mendi/mendi,* but *neska/neske* (< *neskea*).

A more general process, found in many areas, is this type of deletion, but only in closed syllables (i.e., in the plural, e.g., *seme/semie/semik* 'son/the son/the sons').

3. Alternation patterns

The order of presentation follows that of Table I. The data presented here derive for the most part from fieldwork undertaken by one of the authors (Gaminde).

Nevertheless, when written sources are available for a given dialect, these are given in footnotes. See also Yrizar 1991, 1992a-d, 1997, and sources therein.

3.1 Standard Basque

In standard Basque (*euskara batua*), with *a*-stems the final vowel of the stem is deleted before vowel-initial suffixes. In the absolutive, where what we have is *alabaa* > *alaba* it is not obvious that the vowel that remains is that of the suffix. But this is apparent in other inflected forms such as the ergative plural *alabek*. Other stem-final vowels do not undergo any changes. Standard Basque spelling and pronunciation of vowel sequences is based on the literary tradition of central areas of the Basque Country.

Standard Basque (euskara batua)[4]

			UNINFL	ABS SG	ABS PL
C	a	ak	gizon	gizona	gizonak
-a	-a	-ak	alaba	alaba	alabak
-e	-ea	-eak	seme	semea	semeak
-i	-ia	-iak	ogi	ogia	ogiak
-o	-oa	-oak	asto	astoa	astoak
-u	-ua	-uak	esku	eskua	eskuak

Among present-day local dialects, it appears that only some Lapurdian varieties have the same results as standard Basque:

Ainhoa (Lapurdi)

C	a	ak	gizon	gizóna	gizónak
-a	-a	-ak	alaba	alába	alábak
-e	-ea	-eak	seme	seméa	seméak
-i	-ia	-iak	ogi	ogía	ogíak
-o	-oa	-oak	asto	astóa	astóak
-u	-ua	-uak	esku	eskúa	eskúak

In Goizueta (Navarre) the vowel sequences are the same as in standard Basque in the singular, but Second Vowel Deletion applies in the plural:

Goizueta (western Navarre)

oC	a	ak	gizon	gizoná	gizonák
uC	a	ak	egun	eguná	egunák
-a	-a	-ak	alaba	alabá	alabák
-e	-ea	-ek	seme	semeá	semék
-i	-ia	-ik	ogi	ogiá	ogík
-o	-oa	-ok	asto	astoá	astók
-u	-ua	-uk	esku	eskuá	eskúk

3.2 Literary Bizkaian

In western Basque dialects, instead of the reduction *aa* > *a* found in central areas, there was a dissimilatory change *aa* >*ea*, which is already attested in the first texts from the western area. This dissimilatory change took place in the singular,

but not in the plural, where, instead, the sequence *-a + ak* was reduced to *-ak* at a later stage.

Literary Bizkaian

			UNINFL	ABS SG	ABS PL
C	a	ak	gizon	gizona	gizonak
-a	-ea	-a(a)k	alaba	alabea	alabaak ~ alabak
-e	-ea	-eak	seme	semea	semeak
-i	-ia	-iak	ogi	ogia	ogiak
-o	-oa	-oak	asto	astoa	astoak
-u	-ua	-uak	esku	eskua	eskuak

The context for the raising of /a/ is morphological (singular inflection). This can be seen by comparing the ergative singular *alabeak* with the absolutive/ergative plural *alabak*, cf. also dat sg *alabeari* vs. dat pl *alabari*, etc.

3.3 Arratia type

Low Vowel Raising: $a + a = ea$ (sg)
Low Vowel Assimilation: $a \rightarrow e$ / V[+ hi] (C) ___

ARRATIA VALLEY (Dima, Igorre, Zeanuri, etc., also neighboring Zeberio, Southern Bizkaia). This dialect differs from Literary Bizkaian in presenting a rule of Low Vowel Assimilation (cf. 2.1) by which /a/ becomes /e/ after a high vowel (also with intervening consonants). In the following tables, *oC* indicates a context where the last vowel of the stem is mid or low (/e/, /o/ or /a/) and is followed by a consonant (or more than one consonant). Similarly, to represent consonant-final stems in which the last vowel is high (/i/ or /u/), *uC* is used as an abbreviation:

Arratia (southwestern Bizkaia)[5]

oC	a	ak	gison	gisoná	gisónak;
uC	e	ek	lagun	laguné	lagúnek
-a	-ea	-ak	alaba	alabeá	alábak
-e	-ea	-eak	seme	semeá	seméak
-i	-ie	-iek	erri	errié	erríek
-o	-oa	-oak	asto	astoá	astóak
-u	-ue	-uek	esku	eskué	eskúek

The accentual pattern given is the one occurring in nonfinal position. In phrase-final position the accent is retracted from the last syllable to the penultimate; e.g., *gisoná da* 'it is the man', *gisoná dator* 'the man is coming', but *gisóna* 'the man'. No accent-shift takes place in the plural. The same forms are found in Mungia, where there is no accent retraction: *alaba, alabeá, alábak; seme, semeá, seméak*; *idi, idié, idíek; asto, astoá, astóak; katu, katué, katúek.*

OROZKO (Southern Bizkaia). The forms are almost the same as in Arratia, but (a) the accent regularly falls on the second syllable in sg and pl and (b) *u + ak > uek > uik*:

Orozko (southwestern Bizkaia)

oC	a	ak	gison	gisóna	gisónak
uC	e	ek	lagun	lagúne	lagúnek
-a	-ea	-ak	alaba	alábea	alábak
-e	-ea	-eak	seme	seméa	seméak
-i	-ie	-iek	erri	erríe	erríek
-o	-oa	-oak	asto	astóa	astóak
-u	-ue	-uik	esku	eskúe	eskúik

LEGAZPI (Southern Gipuzkoa). Same as in Arratia in the absolutive singular, but with vowel-final stems the vowel of the suffix assimilates completely to the final vowel of the stem in a close syllable. There is regular post-initial accentuation.

Legazpi (southern Gipuzkoa)

oC	a	ak	gizon	gizóna	gizónak
uC	e	ek	lagun	lagúne	lagúnek
-a	-ea	-a(a)k	alaba	alábea	alábak
			neska	neskéa	neskáak
-e	-ea	-eek	seme	seméa	seméek
-i	-ie	-iik	erri	erríe	erríik
-o	-oa	-ook	asto	astóa	astóok
-u	-ue	-uuk	esku	eskúe	eskúuk

ZEGAMA (Southern Gipuzkoa). Same as Legazpi above, except that there is no assimilation in /e + ak/. In addition, with /-a/-stems, in the singular raising is not consistent. Young speakers tend to reduce the long vowels of plural forms.

Zegama (southern Gipuzkoa)[6]

oC	a	ak	gizon	gizóna	gizónak
uC	e	ek	lagun	lagúne	lagúnek
-a	-ea	-aak	neska	neskéa	neskáak
	-aa	-aak	alaba	alabáa	alabáak
-e	-ea	-eak	bide	bidéa	bidéak
-i	-ie	-iik	erri	erríe	erríik
-o	-oa	-ook	asto	astóa	astóok
-u	-ue	-uuk	esku	eskúe	eskúuk

ZALDIBIA (Southern Gipuzkoa). Same as Legazpia, but the long vowels resulting from assimilation in plural forms have been reduced (i.e., the vowel of the suffix /-ak/ is deleted with vowel-final stems).

Zaldibia (southern Gipuzkoa)[7]

oC	a	ak	gizon	gizóna	gizónak
uC	e	ek	lagun	lagúne	lagúnek
-a	-ea	-ak	taberna	tabérnea	tabérnak
-e	-ea	-ek	bide	bidéa	bídek
-i	-ie	-ik	erri	erríe	érrik
-o	-oa	-ok	asto	astóa	ástok
-u	-ue	-uk	esku	eskúe	éskuk

3.4 Getxo type

This type is found in an area of northern Bizkaia close to Bilbao: Sopela, Gatika, Getxo, Erandio, Berango, Barrika, Gorliz, Lemoiz, Urduliz. It is the result of a further development in the Arratia system: in all sequences of two vowels the second one has been deleted (Second Vowel Deletion); e.g., *alabéa* > *alabé, astóa* > *astó.*

Low Vowel Raising
Low Vowel Assimilation
Second Vowel Deletion

Getxo (northwestern Bizkaia, coast)[8]

oC	a	ak	gison	gisoná	gisónak
uC	e	ek	lagun	laguné	lagúnek
-a	-e	-ak	alaba	alabé	alábak
-e	-e	-ek	seme	semé	sémek
-i	-i	-ik	erri	erí	érrik
-o	-o	-ok	asto	astó	ástok
-u	-u	-uk	esku	eskú	éskuk

3.5 18th century Markina

This is the system found in the writers of the so-called Markina school, including J. A. Moguel, author of *Peru Abarca*, and also in the translations into the Markina dialect commisioned by L. L. Bonaparte. In Markina there have been important changes since then, but very similar systems are still found in parts of eastern Bizkaia and western Gipuzkoa. This type of alternation is characterized by the following processes: Stem final mid vowels rise to high when followed by another vowel in both singular and plural, and also morpheme-internally (Mid Vowel Raising, 2.3.2). This change also affected the sequence [ea] produced in singular forms of *a*-final stems: *neskaa* > *neskea* > *neskia*. With /i/-final and /u/-final stems, a 'consonantized glide' is inserted (2.4.1). In the case of /i/, the epenthetic segment historically was probably a nonstrident palatal, which is still found as an epenthetic segment in areas of Gipuzkoa and Navarre presenting this rule. This segment later became a stridend [ž] in western Gipuzkoa and Bizkaia, which finally was devoiced to [š] in a large part of the area (devoicing is still an ongoing process in several towns, including Azkoitia). Epenthesis after /u/ is also found in a large area of Bizkaia, Gipuzkoa, Navarre and Lapurdi in older texts, but this phenomenon has been receding and the epenthetic [β] has been lost almost everywhere (including present-day Markina). The change has been *ua* > *uβa* > *ua* in most of the area where epenthetic [β] is documented in the 18th and 19th centuries. Nowadays too, there are parts of Gipuzkoa where older speakers pronounce *-uβa* and younger speakers *-ua*.

Low Vowel Raising
Mid Vowel Raising
Consonant Epenthesis

18th century Markina (northeastern Bizkaia, coast)

-C	a	ak	gizon lagun	gizona laguna	gizonak lagunak
-a	-ia	-aak	alaba	alabia	alabaak
-e	-ia	-iak	seme	semia	semiak
-i	-iža	-ižak	erri	erriža	errižak
-o	-ua	-uak	asto	astua	astuak
-u	-uba	-ubak	esku	eskuba	eskubak (b = [β])

3.6 Lekeitio/Deba type

This system represents an evolution of the pattern given in 3.5 for 18th Century Markina, where the epenthetical consonant has been lost with *u*-final stems, and in the pl of *a*-final stems, the long vowel has been reduced.

Lekeitio (northeastern Bizkaia, coast)[9]

-C	a	ak	gixon lagun	gixoná laguná	gixónak lagúnak
-a	-ia	ak	alaba	alabiá	alábak
-e	-ia	-iak	seme	semiá	semíak
-i	-iža	-ižak	erri	erriží	errížak
-o	-oa	-uak	asto	astuá	astúak
-u	-ua	-uak	esku	eskuá	eskúak

The same results, but with devoicing of ž > š (and different accentual systems), are found in the Deba Valley of western Gipuzkoa (Eibar, Bergara, Antzuola, Elgoibar, Oñati).[10]

OÑATI. This system differs from Lekeitio in that, (a) [ž] has been devoiced to *x* [š], and (b) the sequence *-aa-* has been preserved in the plural (but is in the process of being lost when unaccented in the speech of younger speakers).

Oñati (southwestern Gipuzkoa)

oC	a	ak	gison	gisóna	gisónak
uC	a	ak	lagun	lagúna	lagúnak
-a	-ia	-aak	alaba	alábia	alábaak
-e	-ia	-iak	seme	semía	semíak
-i	-ixa	-ixak	erri	errixa	errixak
-o	-ua	-uak	asto	astúa	astúak
-u	-ua	-uak	esku	eskúa	eskúak

ANTZUOLA. Same as Oñati, without long vowels in the plural of *a*-final stems (and a different accentual system).

Antzuola (southwestern Gipuzkoa)

oC	a	ak	gison	gisóna	gísonak
uC	a	ak	lagun	lagúna	lágunak
-a	-ia	-ak	alaba	alabía	álabak
-e	-ia	-iak	seme	semía	sémiak
-i	-ixa	-ixak	erri	errixa	érrixak
-o	-ua	-uak	asto	astúa	ástuak
-u	-ua	-uak	esku	eskúa	éskuak

For the accentual pattern cf. Hualde 1997a. The general rule is penultimate accent, but in plural forms the accent appears two syllables before the suffix. The same vowel sequences as in Antzuola are found in Bergara, Deba, Elgoibar, Elorrio, Itziar, Mutriku. The accentual systems vary considerably within this area.

ELORRIO, Elgoibar. In these dialects the vowel patterns are the same as in Antzuola, but the accent is postinitial in sg and pl.:

Elorrio (southeastern Bizkaia)[11]

oC	a	ak	gison	gisóna	gisónak
uC	a	ak	lagun	lagúna	lagúnak
-a	-ia	-ak	alaba	alábia	alábak
-e	-ia	-iak	seme	semía	semíak
-i	-ixa	-ixak	erri	erríxa	erríxak
-o	-ua	-uak	asto	astúa	astúak
-u	-ua	-uak	esku	eskúa	eskúak

MUTRIKU. Same vowel patterns, accent is final in sg and penultimate in pl.

Mutriku (northwestern Gipuzkoa, coast)

oC	a	ak	gixon	gixoná	gixónak
uC	a	ak	lagun	laguná	lagúnak
-a	-ia	-ak	alaba	alabiá	alábak
-e	-ia	-iak	seme	semiá	semíak
-i	-ixa	-ixak	erri	errixá	erríxak
-o	-ua	-uak	asto	astuá	astúak
-u	-ua	-uak	esku	eskuá	eskúak

3.7 Bermeo type

This general system differs from the Lekeitio type (3.6) in having added the process of Low Vowel Assimilation.

Low Vowel Raising
Consonant Epenthesis
Mid Vowel Raising
Low Vowel Assimilation

BERMEO (Bizkaian coast, also Busturia, Murueta)

Bermeo (northcentral Bizkaia, coast)

oC	a	ak	gison	gisoná	gisónak
uC	e	ek	lagun	laguné	lagúnek
-a	-ie	-ak	alaba	alabié	alábak
-e	-ie	-iek	seme	semié	semíek
-i	-iže	-ižek	erri	errižé	errížek
-o	-ue	-uek	asto	astué	astúek
-u	-ue	-uek	esku	eskué	eskúek

The same patterns are found in other northern Bizkaian areas, such as Busturia and Murueta. The translation into the Bermeo dialect of *La doctrina cristiana*, commissioned by L. L. Bonaparte and published in 1862-64 (reprinted in

Bonaparte 1991:II.45-60) shows that at that time the dialect had not acquired Low Vowel Assimilation. That is, the facts were as in present-day Lekeitio (3.6). This situation is still found in neighboring Mundaka.

In Bermeo, accent is generally phrase-final, but plural suffixes are preaccenting. In the towns of Arteaga and Nabarriz the same system is found as in Bermeo, but in the plural the accent is retracted two syllables: *gixoná, gíxonak; laguné, lágunek; alabié, alábak; semié, sémiek; erriže, érrižek; astué, ástuek; eskué, éskuek.*[12]

EA. Same system as in Bermeo, but unmarked accent is penultimate instead of final and in the plural it has also been retracted: *gisóna, gísonak; txakúrre, txákurrek; alaba, alabíe, alábak; seme, semíe, sémiek; ardi, ardíže, árdižek; asto, astúe, ástuek; katu, katúe, kátuek.* Gizaburuaga is also like Ea but accent retraction in the plural is less systematic.

OTXANDIO, Euba, Iurreta, Berriz, Oleta, Nafarrate, Elosu: same as Bermeo, but accent falls on the second syllable in sg and pl (unless the 2nd syllable is the final one).: *gisóna, gisónak; lagúne, lagúnek; alábie, alábak; semíe, semíek; erríže, errížek; astúe, astúek; eskúe, eskúek.* Aramaio is also like this, but with devoicing of *ž*: *erríxe.*

ARAMAIO (Araba/Alava). Same as Bermeo, but *ž* has been devoiced to *x* [š]. The accent falls on the second syllable unless it is the final syllable of the word.

Aramaio (Araba)[13]

oC	a	ak	gison	gisóna	gisónak
uC	e	ek	lagun	lagúne	lagúnek
-a	-ie	-ak	alaba	alábie	alábak
-e	-ie	-iek	seme	semíe	semíek
-i	-ixe	-ixek	erri	erríxe	erríxek
-o	-ue	-uek	asto	astúe	astúek
-u	-ue	-uek	esku	eskúe	eskúek

In rural areas of Arrasate, we find the same patterns as in Aramaio. In the urban center, forms like *neskía, semía, errixa,* etc., without Low Vowel Assimilation, are found instead, but it appears that Low Vowel Assimilation is progressively spreading to the Arrasate urban center as well, and some speakers produce both assimilated and nonassimilated forms.[14]

ABADIÑO. Same as Bermeo, but accent falls on 2nd in sg and 1st in pl: *gisóna, gísonak; lagúne, lágunek; alábie, álabak; semíe, sémiek; erríže, érrižek; astúe, ástuek; eskúe, éskuek.*

AZKOITIA. Same as Bermeo, but with optional Second Vowel Deletion in closed syllables. Some speakers of this variety devoice [ž] to [š]. Incidentally, a peculiar feature of this dialect is that the distinction between apico-alveolar *s* and laminal *z* has been lost in favor of *z*, whereas all other dialects that have lost the contrast (all Bizkaian and many Gipuzkoan varieties) have only apico-alveolar *s*.[15]

Azkoitia (central Gipuzkoa)

oC	a	ak	gizon	gizóna	gízonak
uC	e	ek	lagun	lagúne	lágunek
-a	-ie	-ak	alaba	alabíe	álabak
-e	-ie	-i(e)k	zeme	zemíe	zémi(e)k
-i	-iže	-ižek	erri	erríže	érrižek
-o	-ue	-u(e)k	asto	astúe	ástu(e)k
-u	-ue	-u(e)k	esku	eskúe	ésku(e)k

AZPEITIA, Urrestilla. Same as Azkoitia , but the epenthetic segment with *i*-final stems is the nonstrident palatal *-y-* (in the plural the accent is retracted only one syllable).

Azpeitia (central Gipuzkoa)

oC	a	ak	gizon	gizóna	gizónak
uC	e	ek	lagun	lagúne	lagúnek
-a	-ie	-ak	neska	neskíe	néskak
-e	-ie	-i(e)k	seme	semíe	semíek
-i	-iye	-iyek	erri	erríye	erríyek
-o	-ue	-u(e)k	asto	astúe	astúek
-u	-ue	-u(e)k	esku	eskúe	eskúek

3.8 Gernika type

The only difference with respect to the Bermeo system is that the etymological sequence /o + a/ remains unaltered as [oa] (instead of becoming [ue]). That is, Mid Vowel Raising affects *e*-final stems, but not *o*-final stems.

Low Vowel Raising
Consonant Epenthesis (with *i*-final stems)
Mid Vowel Raising (only with *e*-final stems)
Low Vowel Assimilation

This system is found in towns of the Gernika area such as Arratzu, Muxika, Forua, Errigoitia, Fruiz and Bakio. The accentual system is as in Bermeo (3.7).

Arratzu (Gernika, northcentral Bizkaia)[16]

oC	a	ak	gixon	gixoná	gixónak
uC	e	ek	lagun	laguné	lagúnek
-a	-ie	-ak	alaba	alabié	alábak
-e	-ie	-iek	seme	semié	semíek
-i	-iže	-ižek	erri	errižé	errížek
-o	-oa	-oak	asto	astoá	astóak
-u	-ue	-uek	esku	eskué	eskúek

ZOLLO. In this dialect we find the same sequences as in Arratzu, but the accentual system is different. The accent falls on the second syllable in sg and pl: *gisóna, gisónak; lagúne, lagúnek; alábie, alábak; semíe, semíek; erríže, errížek; astóa, astóak; eskúe, eskúek.*

3.9 Ondarroa/Elantxobe type

This is an evolution of the Bermeo type (3.7), characterized by the further change represented by the loss of final [e] in hiatus.

Low Vowel Raising
Consonant Epenthesis
Mid Vowel Raising (only with *e*-final stems)
Low Vowel Assimilation
Second Vowel Deletion

Elantxobe (northcentral Bizkaia, coast)[17]

oC	a	ak	gixon	gixoná	gixónak
uC	e	ek	lagun	laguné	lagúnek
-a	-i	-ak	alaba	alabí	alábak
-e	-i	-ik	seme	semí	sémik
-i	-iže	-ižek	erri	errižé	errížek
-o	-u	-uk	asto	astú	ástuk
-u	-u	-uk	esku	eskú	éskuk

MUNITIBAR. Same sequences as in Elantxobe. An accentual difference is that in the plural, the accent is retracted one more syllable: *gíson, gisóna, gísonak; lagún, lagúne, lágunek; alába, alabí, alábak; séme, semí, sémik; érri, erríže, érrižek; ásto, astú, ástuk; ésku, eskú, éskuk.* In Berriatua we find the same forms as in Munitibar but with devoicing of ž: *erríxe*. The same system as in Elantxobe is also found in Aulestia (with some accentual differences).

ONDARROA. Same as Elantxobe, but (a) with devocing of *ž*, and (b) Low Vowel Assimilation only affects word-final vowels (and thus it does not apply in the plurals *lagúnak, errixak*):

Ondarroa (northeastern Bizkaia, coast)[18]

oC	a	ak	gixon	gixóna	gixónak
uC	e	ak	lagun	lagúne	lagúnak
-a	-i	-ak	alaba	alabí	alábak
-e	-i	-ik	seme	semí	sémik
-i	-ixe	-ixek	erri	erríxe	errixak
-o	-u	-uk	asto	astú	ástuk
-u	-u	-uk	esku/o	eskú	éskuk

In Ondarroa, the distinction between *o*-stems and *u*-stems has been lost to a great extent.

3.10 Larrauri type

This system differs from the Gernika type (3.8) in that Low Vowel Assimilation does not apply in the sequences of *e*-final and *a*-final stems, which have singular forms in *-ia*, and not *-ie*. From a synchronic point of view, the interaction between Low Vowel Assimilation and Mid Vowel Raising is opaque in a generative analysis. It must be the case that this dialect acquired Low Vowel Assimilation before Mid Vowel Raising.

Low Vowel Raising
Low Vowel Assimilation
Consonant Epenthesis (i-final stems)
Mid Vowel Raising (e-final stems)

Larrauri (western Bizkaia)

oC	a	ak	gixon	gixoná	gixónak
uC	e	ek	lagun	laguné	lagúnek
-a	-ia	-ak	neska	neskiá	néskak
-e	-ia	-iak	abade	abadiá	abádiak
-i	-iže	-ižek	idi	idižé	idížek
-o	-oa	-oak	asto	astóa	astóak
-u	-ue	-uek	esku	eskué	eskúek

As indicated, it must be the case that historically Low Vowel Assimilation preceded the raising of [e]:

Stage 1:		abadea	eskua
Stage 2:	LVA	abadea	eskue
Stage 3:	MVR	abadia	eskue

The same system is also found in neighboring Meñaka.

LEZAMA. Same as Larrauri, but without Consonant Epenthesis.

Lezama (western Bizkaia)

oC	a	ak	gixon	gixóna	gixónak
uC	e	ek	lagun	lagúne	lagúnek
-a	-ia	-ak	alaba	alábia	alábak
-e	-ia	-iak	seme	semía	semíak
-i	-ie	-ie	erri	erríe	erríek
-o	-oa	-oa	asto	astóa	astóak
-u	-ue	-ue	esku	eskúe	eskúek

3.11 Errezil

This system, found in the dialect of Errezil in the Urola valley of central Gipuzkoa, presents a couple of peculiarities with respect to those of other towns of the same valley (Azkoitia, Azpeitia, seen above in 3.7). First of all, it does not have Consonant Epenthesis with *i*-final stems. Secondly, it has acquired a process of Second Vowel Deletion, with all vowel-final stems in the pl, but only with stems ending in a high vowel in the sg.

Errezil (central Gipuzkoa)

oC	a	ak	gizon	gizóna	gizónak
uC	a	ak	txakur	txakúrra	txakúrrak
-a	-ia	-ak	neska	neskía	néskak
-e	-ia	-ek	seme	semía	sémek
-i	-i	-ik	erri	errí	érrik
-o	-ua	-uk	asto	astúa	ástuk
-u	-u	-uak	esku	eskú	éskuk

3.12 Urdiain

Urdiain is one of the very few Navarrese towns to which the dissimilatory change *aa* > *ea* spread. There is also Mid Vowel Raising, so that, subsequently, *ea* > *ia* and *oa* > *ua*. Consonant Epenthesis with both *i*-final and *u*-final stems applies as an optional process. Low Vowel Assimilation applies in the plural (and, in general, in closed syllables).

Low Vowel Raising
(Consonant Epenthesis)
Mid Vowel Raising
Low Vowel Assimilation (only in closed syllables)

Urdiain (western Navarre)[19]

oC	a	ak	gizon	gizóna	gizónak
uC	a	ek	lagun	lagúna	lagúnek
-a	-ia	-ak	alaba	alábia	alábak
-e	-ia	-iek	seme	semía	semíek
-i	-ia	-iek	erri	errí(y)a	errí(y)ek
-o	-ua	-uek	asto	astúa	astúek
-u	-ua	-uek	esku	eskú(b)a	eskú(b)ek

3.13 Zumaia type

In a few towns between the western area where *aa* > *ea* and the central area where *aa* > *a,* the original *-aa* sequence is preserved unchanged. In Zumaia, the double *-aa* is maintained when accented as in *neskáa*, but it is usually shortened if unaccented. This is the only peculiarity of this system. Other than that, there is Consonant Epenthesis with *i*-final stems and Mid Vowel Raising, as in other western Gipuzkoan varieties.

Zumaia (northcentral Gipuzkoa, coast)[20]

oC	a	ak	gison	gisóna	gisónak
uC	a	ak	lagun	lagúna	lagúnak
-a	-aa	-aak	neska	neskáa	neskáak
			alaba	alába	alábak
-e	-ia	-iak	seme	semía	semíak
-i	-ixa	-ixak	erri	erríxa	erríxak
-o	-ua	-uak	asto	astúa	astúak
-u	-ua	-uak	esku	eskúa	eskúak

The same situation is also found in Getaria (where the epenthetic segment with *i*-final stems has not been devoiced: *erríža, errížak*).

3.14 Zarautz type

This is the typical northern Gipuzkoan system. As in the Lekeitio/Deba type (3.6), found to its west, there is Mid Vowel Raising and Consonant Epenthesis with *i*-final stems. There are, however, two differences that serve to separate this northern Gipuzkoan system from western types: (a) with *a*-final stems we do not find the western disimilation *ea* > *aa*, but simple reduction *aa* >*a* (although in Zarautz

the oldest speakers maintain the etymological geminate vowel *-aa* when stressed, as in Zumaia; e.g., *neskáa ~ neská*); (b) the epenthetic consonant with *i*-final stems is a nonstrident palatal, written *-y-*, and not the strident prepalatal *-ž- ~ -š-*. As was already mentioned, in at least a large part of this territory, there used to be epenthesis with *u*-final stems as well. This is still found as a receding feature in some areas.

Low Vowel Contraction: aa > a
Consonant Epenthesis: ia > iya
Mid Vowel Raising: ea > ia, oa > ua

Zarautz (northcentral Gipuzkoa, coast)

oC	a	ak	gizon	gizóna	gízonak
uC	a	ak	lagun	lagúna	lágunak
-a	-a	-ak	alaba	alába	álabak
-e	-ia	-iak	seme	semía	sémiak
-i	-iya	-iyak	erri	erríya	érriyak
-o	-ua	-uak	asto	astúa	ástuak
-u	-ua	-uak	esku	eskúa	éskuak

In Zestoa, the same patterns are found, with the difference that the accent is not consistently retracted in the pl.

USURBIL provides an example of a variety with the same vowel sequences as in Zarautz, but the general accentual pattern is post-initial both in the singular and in the plural:

Usurbil (northeastern Gipuzkoa)[21]

oC	a	ak	gizon	gizóna	gizónak
uC	a	ak	lagun	lagúna	lagúnak
-a	-a	-ak	alaba	alába	alábak
-e	-ia	-iak	seme	semía	semíak
-i	-iya	-iyak	erri	erríya	erríyak
-o	-ua	-uak	asto	astúa	astúak
-u	-ua	-uak	esku	eskúa	eskúak

The same patterns are also found in Hondarribia, for instance.[22]

LARRAUL, Urnieta. Same patterns as in Zarautz, with the only difference that in the plural of *i*-stems there is no Consonant Epenthesis; rather, with stems ending in a high vowel, the vowel sequence is reduced by Second Vowel Deletion in the plural.

Larraul (east-central Gipuzkoa)

oC	a	ak	gizon	gizóna	gízonak
uC	a	ak	lagun	lagúna	lágunak
-a	-a	-ak	alaba	alába	álabak
-e	-ia	-iak	seme	semía	sémiak
-i	-iya	-ik	erri	erríya	érrik
-o	-ua	-uak	asto	astúa	ástuak
-u	-ua	-uk	esku	eskúa	éskuk

ORIO. In this variety, the treatment of sequences in the singular and the plural differs even more radically than in Larraul and Urnieta. Neither Consonant Epenthesis nor Mid Vowel Raising applies in the plural (although both rules apply in the singular). Instead all vowel sequences are reduced by Second Vowel Deletion in the plural.

Orio (northcentral Gipuzkoa, coast)[23]

oC	a	ak	gizon	gizóna	gízonak
uC	a	ak	lagun	lagúna	lágunak
-a	-a	-ak	alaba	alába	álabak
-e	-ia	-ek	seme	semía	sémek
-i	-iya	-ik	erri	erríya	érrik
-o	-ua	-ok	asto	astúa	ástok
-u	-ua	-uk	esku	eskúa	éskuk

ARANO. In this Navarrese town on the Gipuzkoan border, we find the Zarautz-type pattern in the singular. In the plural, sequences are reduced by Second Vowel Deletion, as in Orio immediately above, but Mid Vowel Raising applies: *-eak* > *-iak* > *-ik*. (In a generative description, Mid Vowel Raising would be ordered before Second Vowel Deletion):

Arano (western Navarre)

oC	a	ak	gizon	gizóna	gizonák
uC	a	ak	egun	egúna	egunák
-a	-a	-ak	alaba	alába	alabák
-e	-ia	-ik	seme	semía	semík
-i	-iya	-ik	ogi	ogíya	ogík
-o	-ua	-uk	asto	astúa	astúk
-u	-ua	-uk	esku	eskúa	eskúk

3.15 Alegia type

This is the Gipuzkoan counterpart of the western Arratia type (3.3). As in Arratia, there is Low Vowel Assimilation, but no Mid Vowel Raising or Consonant Epenthesis. The difference between both systems is found in *a*-final stems:[24]

Low Vowel Contraction
Low Vowel Assimilation

In addition, in Alegia Second Vowel Deletion applies in the plural.

Alegia (east-central Gipuzkoa)

oC	a	ak	gizon	gizóna	gizónak
uC	e	ek	txakur	txakúrre	txakúrrek
-a	-ea	-ak	alaba	alába	alábak
-e	-ea	-ek	seme	seméa	sémek
-i	-ie	-ik	erri	erríe	érrik
-o	-oa	-ok	asto	astóa	ástok
-u	-ue	-uk	esku	eskúe	éskuk

LIZARTZA. The same patterns are also found in this dialect, with the difference that Second Vowel Deletion applies in the plural of stems ending in a high vowel, but not with stems ending in a mid vowel; that is: *-iek* > *-ik*, *-uek* > *-uk*, but *-eak*, *-oak* are left unchanged.

Lizartza (east-central Gipuzkoa)

oC	a	ak	gizon	gizóna	gizónak
uC	e	ek	txakur	txakúrre	txakúrrek
-a	-a	-ak	alaba	alába	alábak
-e	-ea	-eak	seme	seméa	seméak
-i	-ie	-ik	erri	erríe	érrik
-o	-oa	-oak	asto	astóa	astóak
-u	-ue	-uk	esku	eskúe	éskuk

3.16 Etxarri type

This system shows Consonant Epenthesis with stems ending in both high vowels, Mid Vowel Raising, and Low Vowel Assimilation.

Low Vowel Contraction
Consonant Epenthesis
Mid Vowel Raising
Low Vowel Assimilation

Etxarri (western Navarre)[25]

oC	a	ak	gizon	gizóna	gizónak
uC	e	ek	lagun	lagúne	lagúnek
-a	-a	-ak	alaba	alába	alábak
-e	-ie	-iek	seme	semíe	semíek
-i	-iye	-iyek	erri	erríye	erríyek
-o	-ue	-uek	asto	astúe	astúek
-u	-ube	-ubek	esku	eskúbe	eskúbek

3.17 Lizarraga type

Perhaps the most important High Navarrese innovation, which allows us to characterize most of the varieties of this territory (excluding the westernmost Navarrese area), is the realization in a diphthong of sequences that are realized in hiatus in other dialects. Generally speaking, in High Navarrese varieties stem-final mid vowels become glides in inflected forms. In some varieties (but not all) stem-final high vowels also glide. The Lizarraga type is a subtype of this general High Navarrese type.

In Lizarraga there is a maximal distinction between inflected forms of stems ending in mid vowels and in high vowels: whereas stem-final mid vowels are realized as glides before vowel-initial suffixes, with stems ending in a high vowel there is Consonant Epenthesis. It must be the case that historically Consonant Insertion was acquired before Gliding. In addition, Low Vowel Assimilation applies in this dialect.

Low Vowel Contraction
Consonant Epenthesis
Gliding
Low Vowel Assimilation

Lizarraga (western Navarre).

oC	a	ak	gizon	gízoná	gízonák
uC	e	ek	lagun	láguné	lágunék
-a	-a	-ak	alaba	álabá	álabák
-e	-ie	-i̯ek	seme	sémi̯é	sémi̯ék
-i	-iye	-iyek	erri	érriyé	érriyék
-o	-u̯e	-u̯ek	asto	ástu̯é	ástu̯ék
-u	-ube	-ubek	esku	éskubé	éskubék

3.18 Ultzama type

In the dialect spoken in the Ultzama valley of the central Navarrese area, stems ending in mid vowels and high vowels also show very different sequences in inflected forms. The patterns are different from those of Lizarraga (immediately above). There is Gliding with stems ending in a mid vowel, but stem-final high vowels are syllabic in inflected forms. Unlike in Lizarraga, there is no Consonant Epenthesis. On the other hand, Low Vowel Assimilation applies with stems ending in a high vowel, but not with stems ending in a mid-vowel, even if these mid vowels are realized as high glides (thus creating surface opacity in a generative analysis).

Low Vowel Contraction
Low Vowel Assimilation
Gliding

Ultzama (central Navarre)[26]

oC	a	ak	gizon	gizóna	gizónak
uC	e	ek	egun	egúne	egúnek
-a	-a	-ak	alaba	alába	alábak
-e	-i̯a	-i̯ak	seme	sémi̯a	sémi̯ak
-i	-ie	-iek	ogi	ogíe	ogíek
-o	-u̯e	-u̯ek	otso	ótsu̯a	ótsu̯ak
-u	-ue	-uek	esku	eskúe	eskúek

The fact that mid vowels glide but high vowels do not is remarkable. The explanation may be that at the point the Gliding process was adopted, stem-final high vowels triggered Consonant Epenthesis (as in Lizarraga), which prevented their gliding. These epenthetic consonants were later lost. A possible historical evolution is the following:

Stage 1:	semea	ogia
Stage 2: LVA	semea	ogie
Stage 3: C Ep	semea	ogiye
Stage 4: Gliding	semi̯a	ogiye
Stage 5: loss of CEp	semi̯a ~ semia	ogie

ETXALEKU. In this neighboring variety, the patterns are similar to those of the Ultzama dialect, with some minor differences: (a) in the plural, Second Vowel Deletion applies with stems ending in a high vowel; (b) the result of Gliding is normally a nonsyllabic mid vocoid [e̯], [o̯]:

Etxaleku

oC	a	ak	gizon	gízonà	gízonàk
uC	e	ek	egun	égunè	égunèk
-a	-a	-ak	alaba	álabàk	álabàk
-e	-e̯a	-e̯ak	seme	sémẹ̀à	sémẹ̀àk
-i	-ie	-ik	obi	óbiè	óbik
-o	-o̯a	-o̯ak	otso	ótso̯à	ótso̯àk
-u	-ue	-uk	esku	éskuè	éskuk

3.19 Basaburua type

In this Navarrese system, the vowel of the suffix completely assimilates to the preceding vowel with *e*-final, *i*-final, and *u*-final stems (Total Progressive Assimilation). With *e*-final stems the evolution has been *ea* > *ia* (> *ie*) > *ii*. On the other hand, the sequence *-oa* remains unchanged. This is reminiscent of the Gernika-type situation. This dialect also shows the effects of Low Vowel Assimilation, but only with consonant-final stems.

Low Vowel Contraction
Low Vowel Assimilation
Mid Vowel Raising (only *e*-final stems)
Total Progressive Assimilation

Basaburua Valley (central Navarre)

oC	a	ak	gizon	gízonà	gízonàk
uC	e	ek	egun	égunè	égunèk
-a	-a	-ak	alaba	álabà	álabàk
-e	-ii	-ik	seme	sémìi	sémìk
-i	-ii	-ik	obi	óbii	óbik
-o	-oa	-oak	otso	ótsoà	ótsoàk
-u	-uu	-uk	esku	éskuù	éskùk

In part of Basaburua (Arrarats), some stems in *-a* optionally end in *-ii* in the absolutive singular and in *-ik* in the absolutive plural. An *-i* ending instead of *-a* is also used optionally with some consonant-final nouns, mostly borrowings:

-a	-ii	-iik	karta	kartii	kartik	'letter'
	(-a	-ak)		~ karta	~ kartak	
			pastilla	pastillii	pastillik	'pill'
				~ pastilla	~ pastillak	
aC	-i	-ik	ospital	ospitali	ospitalik	'hospital'
				~ ospitala	~ ospitalak	

It appears that *-i* (the result of Total Progressive Assimilation with stems ending in a front vowel) is starting to compete with *-a* as the unmarked form of the determiner suffix in this dialect.

3.20 Beruete

This is essentially the same system as in Basaburua (Beruete is a town in the Basaburua Valley), with the only difference that this dialect does not have Mid Vowel Raising in the singular and, consequently, with *e*-final stems Total Progressive Assimilation produces *-ee*. The only different with respect to the Basaburua system (3.19) is thus in the behavior of *e*-final stems.

Low Vowel Contraction
Low Vowel Assimilation
Total Progressive Assimilation

Beruete (central Navarre)

oC	a	ak	gizon	gízonà	gízonàk
uC	e	ek	egun	égunè	égunèk
-a	-a	-ak	alaba	álabà	álabàk
-e	-ee	-ik	seme	sémeè	sémìk
-i	-ii	-ik	obi	óbiì	óbik
-o	-oa	-oak	otso	ótsọà	ótsọàk
-u	-uu	-uk	esku	éskuù	éskùk

3.21 Baztan type

In this system both high and mid stem-final vowels lose their syllabicity in vowel sequences. In careful speech, nonsyllabic mid vowels may not rise: *sémi̯a ~ sémẹa, ótsu̯a ~ ótsọa*. As in Ultzama (3.18), Low Vowel Assimilation applies with stems ending in a high vowel, but not with those ending in a mid vowel.

Low Vowel Contraction
Low Vowel Assimilation
Gliding (both mid and high vowels)

Baztan Valley (northern Navarre)[27]

oC	a	ak	gizon	gizóna	gizónak
uC	e	ek	egun	egúne	egúnek
-a	-a	-ak	alaba	alába	alábak
-e	-i̯a	-i̯ak	seme	sémi̯a	sémi̯ak
-i	-i̯e	-i̯ek	ogi	ógi̯e	ógi̯ek
-o	-u̯a	-u̯ak	otso	ótsu̯a	ótsu̯ak
-u	-u̯e	-u̯ek	esku	ésku̯e	ésku̯ek

The same system is found in the Esteribar Valley, to the east of Baztan.

3.22 Aezkoa type

In Aezkoa, vowel sequences are for the most part left unmodified. Unlike in Baztan (3.21), there is no Low Vowel Assimilation. As in Baztan, hiatus is avoided by gliding.

Low Vowel Contraction
Gliding (both mid and high vowels)

Aezkoa (northeastern Navarre)[28]

oC	a	ak	gizon	gizóna	gizónak
uC	a	ak	egun	egúna	egúnak
-a	-a	-ak	alaba	alába	alábak
-e	-e̯a	-e̯ak	seme	sémea	sémeak
-i	-i̯a	-i̯ak	ogi	ógia	ógiak
-o	-o̯a	-o̯ak	otso	ótso̯a	ótso̯ak
-u	-u̯a	-u̯ak	esku	éskua	éskuak

3.23 Zaraitzu (Salazar)

What characterizes the resolution of vowel sequences in the dialect of Salazar, or Zaraitzu, is that in the absolutive singular of *a*-final stems, instead of contraction there is an epenthetic segment *-r-*: *alabaa* > *alabara*. Otherwise, we find the same results as in Aezkoa. The gliding of mid vowels may result in mid or high glides.

Epenthesis *a* + *a* > *ara*
Gliding (both mid and high vowels)

Zaraitzu (Salazar, northeastern Navarre)[29]

oC	a	ak	gizon	gizóna	gizónak
uC	a	ak	egun	egúna	egúnak
-a	-ara	-ak	alaba	alábara	alábak
-e	-e̯a	-e̯ak	seme	sémea	sémeak
	-i̯a	-i̯ak		sémia	sémiak
-i	-i̯a	-i̯ak	ogi	ógia	ógiak
-o	-o̯a	-o̯ak	otso	ótso̯a	ótso̯ak
	-u̯a	-u̯ak		ótsua	ótsuak
-u	-u̯a	-u̯ak	esku	éskua	éskuak

3.24 Erronkari (Roncal)

The extinct dialect spoken until recently in the Roncal Valley (in the northeasternmost corner of Navarre) was characterized by two features regarding vowel sequences that set it apart from the dialects of Aezkoa and Zaraitzu/Salazar: (a) with *a*-final stems there is contraction, but uninflected and absolutive singular forms are not identical, because contraction produces contrastive oxytonic stress: *alabaa* > *alabá* (vs. *alába,* uninflected) ; (b) *u* fronts and unrounds in prevocalic position

Low Vowel Contraction: *-aa* > *-á*
Unrounding: *ua* > *ia*
Gliding (both mid and high vowels)

The first of these to changes are shared with its northern neighbor Zuberoan (3.25), whereas Gliding (the change from hiatus to diphthong), which Zuberoan does not share, is a feature shared with other Navarrese varieties (Zaraitzu, Aezkoa, Baztan). It is likely that the last change is more recent in Roncalese and reflects a change in patterns of interaction with speakers of other varieties.

Erronkari (Roncal, northeastern Navarre)[30]

oC	a	ak	gizon	gízona	gízonak
uC	a	ak	egun	éguna	égunak
-a	-á	-ák	alaba	alabá	alabák
-e	-i̯a	-i̯ak	seme	sémi̯a	sémi̯ak
	-e̯a	-e̯ak		séme̯a	séme̯ak
-i	-i̯a	-i̯ak	ogi	ógi̯a	ógi̯ak
-o	-u̯a	-u̯ak	otso	ótsu̯a	ótsu̯ak
	-o̯a	-o̯ak		ótso̯a	ótso̯ak
-u	-i̯a	-i̯ak	esku	éski̯a	éski̯ak

In southern Erronkari, stems in *-u* gave rise to a complex triphthong [-jwa]: *ésku, éski̯u̯a*, and a variant *-ioa* is also attested.

3.25 Zuberoa (Soule)

The northeastern Zuberoan dialect underwent a change by which *u* > *ü* in most positions.[31] This *ü* is unrounded to *i* in prevocalic position: *üa* > *ia*. This dialect also has Mid Vowel Raising. A result of this combination of changes is that *i*-final, *ü*-final and *e*-final stems all produce a sequence *-ia* in the singular and plural. Stem-final vowels maintain their syllabicity in vowel sequences in Zuberoan, unlike in its neighbors south of the Pyrenees. As in Roncal/Erronkari Low Vowel Contraction produces oxytonic stress, against the regular paroxytonic pattern of this dialect.

Low Vowel Contration: *-aa* > *-á*
Unrounding: *-üa* > *-ia*
Mid Vowel Raising

Zuberoa (Soule)[32]

C	a	ak	gízun	gizúna	gizúnak
-a	-á	-ák	alhába	alhabá	alhabák
-e	-ia	-iak	séme	semía	semíak
-i	-ia	-iak	méndi	mendía	mendíak
-o	-ua	-uak	ásto	astúa	astúa
-ü	-ia	-iak	éskü	eskía	eskíak

Plural forms other than the absolutive have final stress: *gizunék* 'the men, eg pl', , *gizunér* 'to the men, dat pl', *semiék* 'the sons, erg pl', *semiér* 'to the sons, dat pl'.

3.26 Sara type

In this dialect area of the Lapurdian inland region, as in Ultzama (3.18), mid vowels lose their syllabicity in prevocalic inflectional contexts but high vowels do not. Nonsyllabic vocoids may be realized as mid or high glides: *e̯a ~ i̯a, o̯a ~ u̯a*.

Low Vowel Contraction
Gliding (only mid vowels)

Sara (Lapurdi inland region)[33]

C	a	ak	gizon	gizóna	gizónak
-a	-á	-ák	alaba	alába	alábak
-e	-e̯a	-e̯ak	seme	sémea	sémeak
	-i̯a	-i̯ak		sémia	sémiak
-i	-ia	-iak	mendi	mendía	mendíak
-o	-o̯a	-o̯ak	asto	ástoa	ástoak
	-u̯a	-u̯ak		ástua	ástuak
-u	-ua	-uak	esku	eskúa	eskúak

As mentioned for Ultzama, the explanation for the lack of gliding with stems ending in a high vowel may be that at the relevant historical point when Gliding was introduced, there was Consonant Epenthesis in inflected forms of stems ending in a high vowel.

The same results are also found in Biriatu and Ahetze.

3.27 Beskoitze type

Here we group a number of Lapurdian systems of alternations that only differ from the Sara type in that the sequence *u* + *a* is modified in one of several ways:

u + a			
ua	Sara	esku/eskúa
üa	Lekorne	esku/esküa
ia	Urepel	esku/eskía
uya	Beskoitze	esku/eskúya

UREPEL. Like Sara but *u* + *a* = *ia*

Urepel (Low Navarre)

C	a	ak	gizon	gizóna	gizónak
-a	-á	-ák	alaba	alába	alábak
-e	-e̯a	-e̯ak	seme	sémea	sémeak
-i	-ia	-iak	mendi	mendía	mendíak
-o	-o̯a	-o̯ak	asto	ástoa	ástoak
-u	-ia	-iak	esku	eskía	eskíak

BESKOITZE. Like Sara, but *u* + *a* = *uya*. The same forms are also found in Milafranga and Mugerre, but with a greater tendency for *o* + *a* = *ua*.

Beskoitze (Lapurdi)

C	a	ak	gizon	gizóna	gizónak
-a	-á	-ák	alaba	alába	alábak
-e	-i̯a	-i̯ak	seme	sémia	sémiak
-i	-ia	-iak	mendi	mendía	mendíak
-o	-o̯a	-o̯ak	asto	ástoa	ástoak
-u	-ua	-uak	esku	eskúya	eskúyak

3.28 Arbona

This system differs from Sara in that there is Gliding only in *e* + *a* = *i̯a*, but *o* + *a* = *ua*.

Arbona (Lapurdi)

C	a	ak	gizon	gizóna	gizónak
-a	-á	-ák	alaba	alába	alábak
-e	-i̯a	-i̯ak	seme	sémi̯a	sémi̯ak
-i	-ia	-iak	ogi	ogía	ogíak
-o	-ua	-uak	asto	astúa	astúak
-u	-ua	-uak	esku	eskúa	eskúak

3.29 Aiherra (Low Navarre)

This is a common system in the Low Navarrese area. It is found in Aiherra, Arboti, Armendaritze, Gabadi, Ilharre and Oragarre. As in Aezkoa (3.22), all stem-final vowels glide in vowel-initial inflected forms. In addition, stem-final *-u* produces *-ia*

Low Vowel Contraction
Gliding (both high and mid vowels)
Unrounding: *-ua* > *-ia*

Aiherra (Low Navarre)

C	a	ak	gizon	gizóna	gizónak
-a	-a	-ak	alaba	alába	alábak
-e	-i̯a	-i̯ak	seme	sémi̯a	sémi̯ak
-i	-i̯a	-i̯ak	ogi	ógi̯a	ógi̯ak
-o	-u̯a	-u̯ak	otso	ótsu̯a	ótsu̯ak
	-o̯a	-o̯ak		ótso̯a	ótso̯ak
-u	-i̯a	-i̯ak	esku	éski̯a	éski̯ak

In some towns of this area, *e* + *a* = *i̯a* , *o* + *a* = *u̯a* appear to be systematic. In other towns, the raising on nonsyllabic mid vowels is less consistent. In Arboti, *e* + *a* = *i̯a*, but *o* + *a* = *o̯a*.

4. A note on the spread of sound changes

The historical record shows that whereas some of the processes affecting vowel sequences have spread considerably during the last few centuries, some others have been lost in much of their former territory. A process that has lost much ground is Consonant Epenthesis in *u* + V sequences. When L. L. Bonaparte began the systematic study of Basque dialects, this process was found over much of Bizkaia and Gipuzkoa, and also in areas of Navarre and Lapurdi. Nowadays, it is only found in a small area of Navarre and, as a receding process, in some northern Gipuzkoan towns. On the other hand, the process of Low Vowel Assimilation has spread noticeably during this same period.

One of the best-documented varieties is that of Markina, for which, besides present-day data, we have Rollo's 1925 description and several earlier literary works, including J. A. Moguel's *Peru Abarca*, written around 1800. The treatment of vowel sequences in this variety has changed rather strikingly in the time for which we possess a historical record. The system found in *Peru Abarca* is the following:

Markina around 1800

-C	a	ak	gizon	gizona	gizonak
			lagun	laguna	lagunak
-a	-ia	-aak	alaba	alabia	alabaak
-e	-ia	-iak	seme	semia	semiak
-i	-iža	-ižak	erri	erriža	errižak
-o	-ua	-uak	asto	astua	astuak
-u	-uba	-ubak	esku	eskuba	eskubak

Some fifty years later, the sequence *-aak* of the plural forms of *a*-final stems had been reduced, if we are to trust J. A. Uriarte's translation of Salomon's Song into the Markina dialect. Bonaparte (1869:xxxi, fn. 9 [1991, I.259]) informs us that in forms such as *eskuba* the *-b-* could be deleted ('quoique plus rarement') in the variety of Markina at the time.

Rollo's 1925 study shows that by the beginning of the 20th century, the following changes have taken place:

(a) Epenthetic *-b-* has been lost.
(b) Epenthetic *-ž-* has been devoiced to *-x-* [š].
(c) The dialect has acquired Low Vowel Assimilation.

Markina around 1900

oC	a	ak	gixon	gixona	gixonak
uC	e	ek	lagun	lagune	lagunek
-a	-ie	-ak	alaba	alabie	alabak
-e	-ie	-iek	seme	semie	semiek
-i	-ixe	-ixek	erri	errixe	errixek
-o	-ue	-uek	asto	astue	astuek
-u	-ue	-uek	esku	eskue	eskuek

Since then, a new change has been acquired: Second Vowel Deletion. This is still an optional process, which is favored by younger speakers. The forms found in present-day Markina are the following, where vowels in parenthesis are optionally (but frequently) deleted:

Markina, present day[34]

oC	a	ak	gixon	gixóna,	gíxonak
uC	e	ek	lagun	lagúne	lágunek
-a	-ie	-ak	alaba	alabí(e)	alábak
-e	-i(e)	-i(e)k	seme	semí(e)	sémi(e)k
-i	-ixe	-ixek	erri	erríxe	érrixek
-o	-u(e)	-u(e)k	asto	astú(e)	ástu(e)k
-u	-u(e)	-u(e)k	esku	eskú(e)	ésku(e)k

A related phenomenon is the partial loss of the etymological distinction between *o*-final and *u*-final stems, so that in the uninflected form, variants such as *esko, buro,* etc. are heard. This has obviously been caused by the lack of differentiation that these stems show in inflected forms.

To give another interesting example, it appears that in the 19th century in the dialect spoken in rural areas of Orozko, Bizkaia, a bilabial nasal *-m-* was epenthesized with stems ending in /-o/; e.g.,: *ollo* 'chicken', *olloma* 'the chicken', *arto* 'corn', *artoma* 'the corn' (Bonaparte 1862:33-34, 1869:xxxi, fn. 9 [1991, I.259], cf. also Elordui 1995). Nowadays there is no trace of this phenomenon, which, apparently, was already stigmatized and receding at the time.

From all of this, it could be concluded that there is great instability in the treatment of vowel sequences. However, there are also signs of conservatism. The *u + a = uya* rule employed by the first book written in Basque, *Linguae Vasconum Primitiae* 1545, by the Low Navarrese writer Bernard Dechepare, is still used in Low Navarre, four centuries later.

NOTES

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[1] Orthographic correspondences. *ü* = IPA [y], *s* = voiceless apico-alveolar fricative, *z* = voiceless laminal fricative, *x* = [ʃ], *rr* = alveolar rhotic trill, *r* = alveolar rhotic flap in intervocalic position, *ll* = palatal lateral, *ñ* = palatal nasal.

[2] More precisely, as Zuazo (1998:213) indicates, this assimilation is found in all of Bizkaia (except for Mundaka, Lekeitio, Ermua, and Elorrio), in Araba, in all of southern Gipuzkoa, and in a large area of Navarre west of Aezkoa. On the other hand, there is no trace of this phenomenon in the northern dialects.

[3] And, less consistently, also in neighboring Lakuntza and Arruazu.

[4] In the paradigms in this section, the following examples are used: *gizon* 'man', *lagun* 'friend', *txakur ~ zakur* 'dog', *alaba* 'daughter', *neska* 'girl', *seme* 'son', *ogi* 'bread', *mendi* 'mountain', *(h)erri* 'village, country', *asto* 'donkey', *baso* 'forest', *beso* 'arm', *otso* 'wolf', *esku* 'hand', *buru* 'head'.

[5] The dialect spoken in Zeberio is described in Etxebarria Ayesta 1991a, 1991b, cf. also Hualde 1992.

[6] On the Zegama dialect, cf. 1998. This source does not give long vowels, which appear to be a receding feature in this dialect. For Ataun, see Azurmendi 1996.

[7] The acoustic features of vowels in the Zaldibia dialect are studied in P. Etxeberria 1990.

[8] On the Getxo dialect, see Hualde & Bilbao 1992, 1993. For Sopela, see Markaida et al. 1993. For Gatika and Urduliz, see Gaminde 1993, 1994a.

[9] For Lekeitio, see Hualde, Elordieta, & Elordieta 1994, Elordieta 1996.

[10] For Eibar, see T. Echebarria 1965-66, Laspiur 1979. For Bergara, see Elexpuru 1988 and other contributions in UNED-Bergara 1988. For Oñati, see Izagirre 1970. For Ermua, Aranberri 1996.

[11] The accentual system of the Elorrio variety is analyzed in Jansen 1992.

[12] For the accentual system of coastal Bizkaian, see Hualde 1997b.

[13] For the Basque dialects of Araba/Alava, see Zuazo 1997a, Knörr & Zuazo 1998.

[14] For Arrasate, see Elortza & Ormaetxea 1995.

[15] For accentuation in Azkoitia, see Hualde 1997a.

[16] The phonological system of this dialect is analyzed in Hualde 1991.

[17] The accentual system of the Elantxobe dialect is analyzed in Gaminde 1994b.

[18] Studies on the variety of Ondarroa include Rotaetxe 1978, Hualde 1991, 1995a, 1996a.

[19] On the varieties of this area of Navarre, see Zuazo 1995.

[20] For Zumaia, see Gaminde & Hazas 1998.

[21] For Lasarte-Oria, see Labaka et al. 1996.

[22] For the Hondarribia dialect, see Hualde & Sagarzazu 1991, Sagarzazu 1994. See also Holmer 1964, Fraile & Fraile 1996 and Zuazo 1997b on the dialects on the Gipuzkoan/Navarrese boundary.

[23] On the Orio dialect, see Iturain & Loidi 1995.

[24] This pattern is also described by José M. Etxebarria 1985 for the Gaintza neighborhood of Arribe in Navarre.

[25] On the dialect of Etxarri-Aranatz, see Karasatorre et al. 1991. The neighboring variety of Arbizu is studied in Hualde 1991, 1996b. See Pagola 1992, 1995 and Camino 1998 for an overview of the dialects of Navarre.

[26] On the varieties of Ultzama and Basaburua, see Ibarra 1995a, 1995b, 1998, Izagirre 1966.

[27] The Baztan dialect has been analyzed in N'Diaye 1970 and Salaburu 1984. For Esteribar, see Gaminde 1996.

[28] Camino 1997 provides a detailed description of the Aezkoa dialect.

[29] On the now moribund Salazar or Zaraitzu dialect, see Michelena 1967.

[30] For the Roncal or Erronkari dialect, see Azkue 1931, Beloqui et al. 1953, Michelena 1954, Izagirre 1959-61, Gómez 1991, Hualde 1995b.

[31] On this historical change, see Lafon 1937.

[32] On Zuberoan or Souletin, see Larrasquet 1934, 1939, Lafon 1958, Hualde 1993, Gaminde 1995.

[33] The dialect of Sara was the subject of a monographic study by Schuchardt 1922. For several other varieties in the same geographical area, see Gaminde & Salaberria 1997.

[34] For Munitibar and other neighboring varieties, see Gaminde 1994c.

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CULTURE AND SPEECH ACTS: EVIDENCE FROM INDIAN AND SINGAPOREAN ENGLISH

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This paper aims at exploring how varieties of a language differ along sociocultural parameters in language use. It focuses on bringing together research in regional and social variation by studying how the speech act of request is realized in two Outer Circle varieties of English: Indian and Singaporean. The empirical study reported herein shows significant effect of sociocultural factors on the choice of request strategies by Indian and Singaporean subjects. The conclusion raises some questions regarding the methodology, especially the conceptualization of social distance and linear association between politeness and indirectness in crosscultural speech-act research.

1. Introduction

There is a long tradition of research on language variation in linguistics, and the study of geographical and social dialects has resulted in a great deal of insight in how varieties differ from each other. The major focus of research on regional variation, however, has so far been on the structural parameters, i.e., how varieties differ in their phonology, lexicon, and grammatical structure. For instance, differences between the newer (e.g., American) and older (e.g., British) varieties of English have generally been described with respect to such structural features only (e.g., in Quirk et al., 1985). The studies of social variation have focused on the frequency distribution of grammatical features, and have also, to some extent, looked at the ethnic variation in the use of language (e.g., Labov 1972).

A great deal of work, however, still remains to be done on how varieties may differ along sociocultural parameters in language use. Not much systematic effort so far has been directed toward determining how conventions of language use differ across varieties, and how they may have a role in characterizing varieties as distinct. For instance, there is very little information available on questions such as whether the American, British, and Canadian varieties differ as to when an apology or compliment or command is appropriate or what the instruments of these speech acts are, or how conventions of writing expository or argumentative prose differ in the three varieties. That such conventions vary across languages and cultures has been demonstrated by recent research on cross-linguistic strategies utilized for producing narratives (e.g., Chafe 1980), speech acts such as request, apology, expressing gratitude, complaining, correction, etc. (e.g., Blum-Kulka et al. 1989, Blum-Kulka & Kasper 1990, Huang 1996, Silva 1998, Y. Kachru 1991, 1994, 1995a, Kajiwara 1994, Kasper & Blum-Kulka 1993, Okole

1990, Rose 1992, K. K. Sridhar 1991, Wierzbicka 1985a, b, among others), and conventions of writing expository or argumentative prose (e.g., Choi 1986, 1988, Clyne 1983, 1987, Connor & Kaplan 1987, Hinds 1983, 1987, Y. Kachru 1987, 1988, 1992, 1995b, 1996, 1997, among others).

Research on nonnative varieties of English is even more sketchy. Although some theoretical (e.g., B. Kachru 1986, 1987), small scale (e.g., Y. Kachru 1987, 1988, 1991, Valentine 1988) and large scale empirical studies (e.g., B. Kachru 1983, Chishimba 1983, Lowenberg 1984, Magura 1984, among others) on a few aspects of some of the varieties are available, I do not know of any systematic study that utilizes a large data base to demonstrate the relevance of sociocultural parameters in defining a variety (see, however, K. K. Sridhar 1991, S. N. Shridhar 1996 for a preliminary attempt in this direction).

This paper is an attempt to fill this gap by bringing the traditions of research in regional and social variation together and focusing on the sociocultural conventions of linguistic interaction through English in the nonnative contexts of the Outer Circle varieties (B. Kachru 1985). The focus is on the speech act of request in two Outer Circle varieties, Indian and Singaporean English. But, before discussing the study and its findings, it may be useful to review briefly the current state of research on crosscultural speech acts. This body of research is relevant for our purposes here because interactions in indigenized Outer Circle varieties of English represent a crosscultural phenomenon. Almost all users of Outer Circle varieties are bi/multilinguals, and live and function in communities socioculturally different from the Inner Circle English-speaking communities.

2. Crosscultural speech act research

Recent research on crosscultural speech acts has raised serious questions about the universal applicability of several theoretical notions of pragmatics (Levinson 1983, Green 1989), including speech acts (Searle 1969), Gricean maxims (Grice 1975), and politeness principles (Brown and Levinson 1987). Unlike theoretical discussions, where an implicit assumption is made that speech acts refer to the same social acts in all cultures, Fraser et al. (1980:78) explicitly claim that although languages may differ as to how and when speech acts are to be performed, every language 'makes available to the user the same basic set of speech acts ... the same set of strategies — semantic formulas — for performing a given speech act.' In contrast, Wierzbicka 1985a, 1985b claims that speech genres and speech acts are not comparable across cultures and suggests a semantic metalanguage for the crosscultural comparison of speech acts.[1] Flowerdew 1990 points out some of the central problems of speech act theory, including the basic question of the number of speech acts. Wolfson et al. (1989:180) suggest that 'just as different cultures divide the color spectrum into noncorresponding overlapping terms, so the repertoire of speech acts for each culture is differently organized'. Matsumoto 1988, 1989 questions the adequacy of the theoretical notions of conversational implicature as proposed by Grice, and 'face' as postulated by Brown & Levinson 1987 to account for the politeness phenomena in Japanese conversational interactions. Wetzel 1988 concludes that the notion of

'power' as discussed in Brown & Gilman 1960 is culturally bound, and therefore, not applicable to a discussion of verbal interaction in Japanese (see also Ide 1984, McGloin 1984).

Discussing the problems in attempting to use the speech act theory in the analysis of conversation, Schegloff 1988 claims that speech act theoretic analysis has no way of handling temporality and sequentiality of utterances in actual conversation. Schmidt (1983:126) points out the limited applicability of speech act theory in the analysis of conversation because speech acts 'are usually defined in terms of speaker intentions and beliefs, whereas the nature of conversation depends crucially on interaction between speaker and hearer.'

Furthermore, crosscultural speech act research so far has utilized only a limited range of variables, e.g., those of social distance and dominance (Blum-Kulka, House, & Kasper 1989), and, as Rose 1992, 1994 points out, even those are not well-defined and the instruments are also problematic (Rose & Ono 1995).

As regards the data for empirical research on speech acts, only a few studies have utilized the ethnographic method of observation and analysis of utterances produced in real life interactions. Notable among them are the studies of compliments in American English by Manes and Wolfson 1981, a comparative study of compliments in American and South African English by Herbert 1989 , invitations in American English by Wolfson et al. 1983, requests in Hebrew by Blum-Kulka et al. 1985, and apologies in New Zealand English by Holmes 1990. The bulk of speech act research, including crosscultural speech act research, has been conducted using either role play or written questionnaires. Furthermore, only a limited range of speech acts have been researched, the most commonly studied ones being requests and apologies, as in Blum-Kulka, House, & Kasper 1989.

Blum-Kulka, House, & Kasper 1989 represents the culmination of the project on Crosscultural Speech Act Realization Patterns (CCSARP) initiated in 1982 by a number of researchers in several countries. Data were collected from native speakers (NSs) of Danish, American, Australian, and British English, Canadian French, German, Hebrew and Argentinian Spanish, and nonnative speakers (NNSs) of English in Denmark, Germany, and the United States, NNSs of German in Denmark and NNSs of Hebrew in Israel. The instrument used for data collection was a Discourse Completion Task (DCT) consisting of scripted dialogues of sixteen situations, eight each for requests and apologies. The tasks were constructed to account for variation in speech act realization determined by social distance and domination. The tasks did involve some role play in that the subjects were, for example, asked to assume the roles of a waiter, a professor, etc. According to Blum-Kulka (1989:68), the results of the CCSARP data 'revealed the prominence of conventional indirectness as a highly favored requesting option exploited by all the languages studied.' For apologies, Olshtain (1989:171) claims that the CCSARP data showed 'surprising similarities in IFID [Illocutionary Force Indicating Device] and expression of responsibility preferences.'

In this study, I propose to demonstrate that an integrated approach utilizing the insights of sociolinguistics is better suited to make the interaction of sociocul-

tural parameters and strategies of performing speech acts in indigenized varieties of English clearer. The data are drawn from Indian and Singaporean varieties of English.[2]

3. The study

3.1 The method

A Discourse Completion Task (DCT) questionnaire — a modified version of the DCT questionnaire used in Rose 1991 — was administered to approximately 100 students at a constituent college of the Delhi University and the National University of Singapore in January 1993 (reproduced in Appendix A). It is different in two crucial respects from the CCSARP instrument: it does not contain any scripted dialogue, thereby forcing the subjects to come up with a verbal response, and it does not involve any role play. The questionnaire describes situations that students in an Indian or Singaporean college or university setting may encounter, and seeks to elicit responses to such situations. A subject, for example, does not have to pretend to be a police officer, or a university professor. The data consist of responses to the 9 request situations given in the questionnaire. Although a large number of responses were gathered, for various reasons, several responses had to be discarded. The reasons for discarding responses were select responses to only some of the items, reported request rather than direct request, and facetious remarks (e.g., 'I will not say anything, I will dump all her things in the garbage' in response to item no. 2). The responses that were utilized for this study number 40 from India and 72 from Singapore.

3.2 The subjects

The subjects were bachelors degree candidates in their respective institutions and a majority had commenced learning English at the age of three. They were bilinguals and a majority of them used a language other than English at home (See Appendix B (i) for a copy of the instrument used to elicit student data, and B (ii) for a summary profile of the subjects). Note that there were significant inter- and intra-group variations in the language use habits of the Indian and Singaporean subjects. For instance, English was listed as a home language of 36% of Singaporeans, while no Indian subject listed it as such. 43% of Singaporean, but only 27.5% of Indian subjects reported using English for all purposes, including conversation with their parents, grandparents, and siblings.

3.3 The purpose

The objective of the study was to determine whether there were any significant differences between the two cultural groups (Indian and Singaporean) in the use of request strategies in 'identical' situations, and whether the request strategies use varied significantly according to the social parameters of 'relative' social distance and social status. The two terms 'identical' and 'relative' need some explanation.

It is difficult to claim *a priori* that any social situation can be deemed 'identical' across cultures in view of the fact that institutions such as family vary among cultures. Nevetheless, there are some 'universals' in that concepts such as

intimacy, social distance, status, rank, role, etc. have been found to be useful in discussing how social behavior varies in societies and cultures that have been studied so far. Subjects responding to the questionnaires in this study had dual membership: on the one hand, they were members of Indian and Singaporean cultures, respectively, and on the other, they were members of a community of college/university students with shared characteristics. International students from various countries were consulted to ensure that the situations that figure in the questionnaire were such that any student could imagine himself/herself in them and respond accordingly.

What is meant by 'relative' social status and distance is that there is no absolute scale to measure the differences between individuals ranked vertically in terms of status or horizontally in terms of social distance from a given subject in any culture. Status and intimacy/distance are negotiated on the basis of variables such as communicative situations. For instance, though an older sister has a higher status in the family, in a given academic or sports situation, her status may be lower to a younger sister who has the institutional role of, say, a chair of a committee or a captain of a team. Similarly, though a colleague at work may not be an intimate friend, he/she may be less 'distant' as compared to a fellow member of the same profession from a different institution. Conversely, members from different institutions who share ideologies and approaches may feel more 'intimate' as compared to colleagues from the same institution who adhere to competing ideologies and approaches. Again, international students from many countries were consulted to ensure that social status and distance between interactants in the situations set up in the questionnaire would be perceived similarly in any group.

3.4 The analysis

The methodology used to analyze the data comprises a variety of statistical tests to explore significant differences between the two cultural groups, viz., the Indian and the Singaporean. First, a Goodness-of-Fit Test was done by using the Chi-Square distribution for testing the hypothesis that significant differences exist between the groups. Then, a Proportion Test was done to test the hypothesis that there are differences in the proportion of the use of one kind of request strategy (i.e., the use of Impositives) between the two cultural groups. Lastly, Categorical Analysis using Log Linear Modelling Techniques was done with a view to quantifying the magnitude of association among the variables of culture and response types (Direct Request, Desire Statement, Query Preparatory, and Hint). Hierarchical Log Linear Analysis was done to fit a Hierarchical Saturated Model and produce parameter estimates for such a model. The Log Linear Estimation was subjected to two Goodness-of-Fit Tests, Likelihood Ratio Chi-Square, and Pearson Chi-Square.

3.5 The results

A simple analysis of the request strategy types adopted by the Indians and the Singaporeans shows that there were both similarities and differences between the two cultural groups (See Appendices C (i) and C (ii) for the distribution of re-

quest strategy types). In seven situations out of the nine (i.e., in all situations except 'Mess on the Bed', and 'Bus Trip'), the most favored request strategy in both the groups was the same: Query Preparatory (see Table 1).

Table 1
Request Strategy Types
Comparison of the Indian and Singaporean DCT Data

Strategy Type	Indian (N=360)	Singaporean (N=648)
A. Direct Request	22.22%	6.17%
B. Desire Statement	6.95%	1.86%
C. Impositive (A+B)	29.17%	8.03%
D. Q-Preparatory	63.05%	75.15%
E. Hint	7.78%	16.82%
F. Q-Preparatory + Hint	70.83%	91.97%

However, in a different combination of seven situations, (i.e., excluding the 'Bus Trip' and 'Dinner'), the second most favored strategy among the Indian subjects was Direct Request. Direct Request was also the first preference strategy in case of 'Bus trip' among the Indian subjects. Among the Singaporeans, the second most preferred strategy in six situations (except for 'Music', 'Test Postponement', and 'Bus') was hint, and in case of 'Bus Trip', it was the first preference response.

Table 2
Distribution of Main Request Strategy Types
Indian N=360; Singaporean N=648

Situation	Subjects	Direct Req	Desire Stat	Q-Prep	Hint
S1 (Music)	Indian	.27%	.00%	.70%	.03%
	Singaporean	.20%	.01%	.72%	.09%
S2 (Bed)	Indian	.70%	.08%	.17%	.05%
	Singaporean	.22%	.00%	.49%	.29%
S3 (Test P)	Indian	.08%	.00%	.87%	.05%
	Singaporean	.00%	.04%	.96%	.03%
S4 (Photo)	Indian	.02%	.02%	.93%	.03%
	Singaporean	.00%	.00%	.99%	.01%
S5 (Test H)	Indian	.25%	.05%	.62%	.08%
	Singaporean	.04%	.07%	.79%	.10%
S6 (Bus)	Indian	.28%	.02%	.62%	.08%
	Singaporean	.01%	.00%	.44%	.55%
S7 (Dinner)	Indian	.02%	.28%	.50%	.20%
	Singaporean	.01%	.03%	.72%	.24%
S8 (Library)	Indian	.15%	.00%	.78%	.07%
	Singaporean	.01%	.00%	.87%	.12%
S9 (Menu)	Indian	.22%	.18%	.48%	.12%
	Singaporean	.05%	.01%	.79%	.14%

Overall, the Singaporean subjects displayed a distinct preference for the strategies of Query Preparatory and Hint in contrast to the Indian subjects. Though the Query Preparatory was the preponderant request strategy among the Indian subjects, too, a significant number of these subjects used direct requests. If we exclude the situational factor, there was a substantial difference between the two groups in the choice of request strategies, and this is attributable to culture-specific factors. Whereas about 71% of the Indian subjects used Query Preparatory and Hint strategies, their use was a much higher 92% among the Singaporeans. While the Indian preference for Impositives was 30%, only around 8% of the Singaporeans chose this strategy in the sample responses (see Table 2).

Although this simple analysis does not reveal all the factors at play in the choice of request strategies, even this rough analysis points to the existence of significant cultural group-related differences in the choice of strategies for performing speech acts. A comparison of the use of Alerters in the request speech acts by the two groups also confirms this point of cultural group-specific differences (see Table 3).

Table 3
Comparison in the Use of Alerters
Indian N=360; Singaporean N=648

Situation	Indian	Singaporean
1. Music (+D, =S)	45.0%	48.6%
2. Bed (-D, +S)	32.5%	40.3%
3. Test P (-D, +S)	2.5%	65.3%
4. Photo (+D, +S)	12.5%	76.4%
5. Test H (-D, =S)	62.5%	44.4%
6. Bus (+D, =S)	62.5%	61.1%
7. Dinner (-D, +S)	17.5%	68.0%
8. Library (+D, +S)	15.0%	70.8%
9. Menu (+D, -S)	30.0%	73.6%
All 9 Situations	31.11%	60.96%

Where D : Social Distance; S : Social Status; + : positive value for D; - : negative value for D (+ and -: higher vs. lower for S); and = : equal.

A Chi-Square Test was performed to test the null hypothesis that the cultural group membership of the subjects was irrelevant to the choice of request strategy types. The response types used by the two groups of subjects across the nine situations were regrouped in the form of a Contingency Table (see Table 4; numbers in parenthesis show the estimated expected frequency numbers).

Thus results showed that the relevance of cultural group membership to the choice of request strategy type was statistically significant at 0.5 percent significance level.

Table 4
Contingency Table with Expected and Observed Numbers

Strategy	Culture Group	
	Indian (C1)	Singaporean (C2)
1. Impositive	105 (56.07)*	52 (100.93)*
2. Query Preparatory	227 (255.36)*	487 (459.64)*
3. Hint	28 (48.93)*	109 (88.07)*

*Estimated Expected Frequency Numbers

$\chi^2 = 86.4279$ and $\chi^2 = 10.(r-1)(c-1)$, α 60

A proportions test also provides the empirical evidence for the significant association between culture group and request strategy. For the purpose of this test, we used the proportion of impositives in total request strategies adopted by each cultural group. Thus, the total number of request strategies used by the Indian group is $(N_X) = 360$ and that used by the Singaporean group is $(N_Y) = 648$.

Results showed that there was statistically significant difference in the use of the impositive by the two cultural groups.

$\hat{P}o = 8.819\ Z\alpha = 0$

Thus the result provided evidence that the occurrence of impositive strategy is much higher in the Indian group as compared to the Singaporean group.

A log linear analysis of the data was done with a view to ascertaining whether there is a significant association between the cultural group and the response type in each of the 9 situations. The data used for this purpose are given in Appendix D. The software package used for this and subsequent analyses was the SPSS window 5.0. The results of the analysis are summarised below (* indicates statistical significance):

Table 5
Log Linear Analysis

Association between cultural groups and RSType in S1-S9

S No.	Situation	Pearson ChiSquare	P-value of the Test
S1	Music	2.26	0.518
S2	Mess on the bed	34.29	0.000*
S3	Test Postponement	10.86	0.013*
S4	Photo	3.87	0.275
S5	Test Help	10.89	0.012*
S6	Bus	34.74	0.000*
S7	Dinner	15.84	0.001*
S8	Library	not done due to empty cells	
S9	Menu	19.54	0.000*

* indicates statistical significance

The above results show that cultural group was a significant factor in determining the choice of the request strategy in all situations except S1, S4 and S8. A log linear analysis excluding the situation facor to test the association between cultural group and response type also resulted in suggesting that the null hypothesis can be rejected comfortably.

In order to further test the nature of interaction between culture, social distance, social status, and the choice of request strategy, a hierarchical analysis was performed on the combined data. In order to avoid too many zero cells, social distance was collapsed into two levels: Equal and Non-Equal. Response type was collapsed into three: Impositive, Query Preparatory, and Hint.

The fitted model is a four-way interaction saturated model. r-level interaction models were discarded because they would give inconsistent parameter estimates. What the fitted model shows is the four way interaction among the variables: culture, social distance, request strategy, and social status. The Chi Square test results were as follows:

Pearson	χ^2	=	7.01569	2 DF	P = .030
ML	χ^2	=	6.45132	2 DF	P = .040

Thus, the null hypothesis of no four-way interaction among the factors can be rejected for both the Pearson Chi Square test and the Maximum Likelihood Chi Square test.

4. Discussion and conclusion

The Contingency Table Goodness of Fit Tests and Proportions Tests provide evidence for the presence of significant association between cultural group and response type. The log linear analysis also confirms this. Furthermore, from the hierarchical model fitting, evidence is found that the choice of the request speech act strategy is a very complex phenomenon in which not merely the culture, but also social parameters, viz., social distance and social status interact in a multi-dimensional fashion. The model utilized here is very robust and has considerable predictive power. Some of the conclusions that can be derived from this model and the parameter estimates are the following:

1. Members of the Indian cultural group in their request transactions with strangers who are of non-equal status are 1.78 times more likely to choose Impositives than Query Preparatory as the speech act strategy. In contrast, the Singaporean cultural group in the same situation is 1.78 times more likely to choose the Query Preparatory strategy.

2. Members of the Indian cultural group in their request strategy with strangers who are of equal status are 1.43 times more likely to choose Hints than Query Preparatory. The Singaporean group, on the other hand, is more likely to choose the Query preparatory in the same situation.

3. Members of the Indian cultural group in their request speech act with strangers of non-equal status are 2.54 times more likely to choose Impositives than Hints.

The Singaporeans in the same situation are 2.54 times more likely to choose Hints than Impositives.

4. The ratio of probability of choice of Impositives to Query Preparatory by the Indian group to that by the Singaporean group is 3.1684.

Impressive as these results are, there are some problems with such studies. I will first mention a set of conceptual problems, and subsequently, a methodological issue.

The conceptual problem has to do with the simpistic notion of social distance and imposition. The conceptualization of D in Brown & Levinson 1987 conflates status, rank, and role, which interact in complex ways in many different languages and cultures. Also, there does not seem to be a strong association between indirectness and politeness (Huang 1996, Silva 1998). Similarly, directness is not always associated with impoliteness (Silva 1998). A full treatment of these observations, however, is a topic for another paper.

Methdologically, most studies on speech act research, including this one, use a captive pool of subject — the university or college students. Although there is nothing wrong with eliciting data from students, their verbal behavior can not be generalized to entire cultures. Therefore, these research efforts need to be supplemented by ethnographic observational studies, analyses of data elicited from diverse groups of users of English, and interview data. I have collected some interview data from another, smaller group of students in India and Singapore which is awaiting analysis. It would be interesting to see if the conclusions drawn from the study presented here are further corroborated by the interview data.

NOTES

[1] It is interesting to note that the same arguments can be made on the basis of data from varieties of English, certainly the indigenized varieties used in Africa, South Asia, South-East Asia, and other parts of the world.

[2] Dr. Jean D'souza and Dr. Anne Pakir helped me in data collection in Singapore and Gaurav Kachru in India. Mr. S.S. Sacchidananda assisted me with the statistical analysis of the data and Dr. Rosa Shim and Professor S. N. Sridhar gave me their comments on the statistical treatment. I am grateful to all of them. Earlier versions of this paper were presented at the annual meeting of the American Association for Applied Linguistics, 1995, and the SEAMEO Regional Language Center (RELC) Seminar, Singapore, 1995.

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APPENDIX A

DCT Questionnaire

There are ten situations described below. Please read the descriptions of each situation and write down what you would say in that situation.

1. You are studying in your room for an important examination. You hear loud music coming from a room opposite your room. You don't know the student who lives there, but you want the loud music to be turned down. What would you say to the student?

2. You are on a school trip and you share a room with one of your friends. One evening when you come back to your room, you find your friend's clothes, books, etc. on your bed. You want the mess to be cleaned up. What would you say?

3. There is a test in class in two weeks, but you will miss class that day because you have to go out of town for your cousin's wedding. You want to know if your professor will allow you to take the test on another day. What would you say?

4. A friend from out of town is visiting you. You are showing your friend around the campus and the city. You want someone to take your photograph together. You see a man dressed in a suit with a briefcase. You want him to take your picture. What would you say?

5. Next week there is a test in your class which is difficult for you. You know your friend is doing well in that subject. You and your friend are having lunch together and you want to see if your friend will help you prepare for the test. What would you say?

6. You get on the bus to go home and you are carrying a lot of books. You are tired and you would like to sit down. The bus seems full, but then you notice that a student is taking up two seats. What would you say to free the seat so that you can sit down?

7. You are having dinner with your friend's family. The food is delicious and you would like some more. What would you say to your friend's mother, who is serving the food?

8. You go to the library to return a lot of books, and your hands are full. You see someone who looks like a professor standing near the door of the library. You need help to open the door. What would you say to this person?

9. You go to a fancy restaurant to celebrate your birthday with some friends. You wait for fifteen minutes, but no one comes to ask you what you want. A waiter passes by. You want him to bring you copies of the menu. What would you say?

Thank you very much.

APPENDIX B (i)

Data Sheet

Please fill in the following information.

1. Name (optional)_____

2. Check One: Male_____Female_____

3. Class_____ (e.g., lst year BA, or whatever)

4. Home language_____

5. Age at which you began learning English_____

6. Medium of Education at High School_____

7. Languages in addition to English that you speak, read and write fluently:

_____

8. Please circle the letters that represent the purposes for which you use English.

A. Conversing with parents, grandparents, etc.

B. Conversing with siblings

C. Writing letters to members of family

D. Conversing with friends

E. Writing letters to friends

F. Listening to Radio

G. Viewing Television Programmes

H. Reading for Pleasure

I. Writing for Pleasure

J. All academic work (Reading, Writing, Discussion, etc.)

Thank you.

APPENDIX B (ii)

Profile of Subjects

	Indian	Singaporean
1. Total Number	40	72
2. Male	17	16
3. Female	23	56
4. 1st year	24	12
5. More Advanced	16	60
6. Home Languages*	7	2
7. HL+English#	5	11
8. Age at which E introduced		
3 yrs. or below	31	32
4 yrs.	6	7
above 4 yrs.	3	33+
9. Medium of Education		
English	40	69
Other Lg(s)	--	3
10. E used for purposes A-J [see 8 in Appendix B (i)]		
All ten purposes	11	31
All other than A	5	7
All other than C	--	6
All other than A & C	--	6
Selective purposes@	24	22

Notes:

* Indian languages such as Hindi, Panjabi, etc., and Chinese dialects such as Mandarin and Cantonese in Singapore.

e.g., bi-/trilingual use of Hindi and/or Panjabi and English by Indian and Mandarin and English by Singaporean subjects.

+ There was more variation among Singaporean subjects as regards the age at which English education began:

5 yrs.	19
6 yrs.	5
7 yrs.	7
Above 7 yrs.	2

@ There were 23 different combinations of purposes reported by Indian subjects and 17 different ones by Singaporean subjects.

APPENDIX C (i)
Distributon of Request Sequence Types

Indian Data

Strategy	S1	S2	S3	S4	S5	S6	S7	S8	S9
Direct Request	11	28	3	1	10	11	1	6	9
Desire Statement	0	3	0	1	2	1	11	0	7
Performative	0	0	0	0	0	0	0	0	0
[Impositives	*11*	*31*	*3*	*2*	*12*	*12*	*12*	*6*	*16]*
Q-Preparatory	28	7	35	37	25	25	20	31	19
Hint	1	2	2	1	3	3	8	3	5
[Q-P + Hint	*29*	*9*	*37*	*38*	*28*	*28*	*28*	*34*	*24]*

APPENDIX C (ii)
Distributon of Request Sequence Types

Singaporean Data

Strategy	S1	S2	S3	S4	S5	S6	S7	S8	S9
Direct Request	14	16	0	0	3	1	1	1	4
Desire Statement	1	0	3	0	5	0	2	0	1
Performative	0	0	0	0	0	0	0	0	0
[Impositives	*15*	*16*	*3*	*0*	*8*	*1*	*3*	*1*	*5]*
Q-Preparatory	52	35	69	71	57	32	52	62	57
Hint	5	21	0	1	7	39	17	9	10
[Q-P + Hint	*57*	*56*	*69*	*72*	*64*	*71*	*69*	*71*	*67]*

APPENDIX D

Data Used for Log Linear Analysis

SITUATION	CULTURE	RSTYPE	SOCDIST	SOCSTAT	COUNT
1	1	1	1	1	1
1	1	2	1	1	0
1	1	3	1	1	28
1	1	4	1	1	1
1	2	1	1	1	14
1	2	2	1	1	1
1	2	3	1	1	52
1	2	4	1	1	5
2	1	1	2	1	28
2	1	2	2	1	3
2	1	3	2	1	7
2	1	4	2	1	2
2	2	1	2	1	16
2	2	2	2	1	0
2	2	3	2	1	35
2	2	4	2	1	21
3	1	1	2	2	3
3	1	2	2	2	0
3	1	3	2	2	35
3	1	4	2	2	2
3	2	1	2	2	0
3	2	2	2	2	3
3	2	3	2	2	69
3	2	4	2	2	0
4	1	1	1	2	1
4	1	2	1	2	1
4	1	3	1	2	37
4	1	4	1	2	1
4	2	1	1	2	0
4	2	2	1	2	0
4	2	3	1	2	71
4	2	4	1	2	1
5	1	1	2	1	10
5	1	2	2	1	2
5	1	3	2	1	25
5	1	3	2	1	3
5	2	1	2	1	3
5	2	2	2	1	5
5	2	3	2	1	57
5	2	4	2	1	7
6	1	1	1	1	11

SITUATION	CULTURE	RSTYPE	SOCDIST	SOCSTAT	COUNT
6	1	2	1	1	1
6	1	3	1	1	25
6	1	4	1	1	3
6	2	1	1	1	1
6	2	2	1	1	0
6	2	3	1	1	32
6	2	4	1	1	39
7	1	1	1	2	1
7	1	2	1	2	11
7	1	2	1	3	20
7	1	4	1	2	8
7	2	1	1	2	1
7	2	2	1	2	2
7	2	3	1	2	52
7	2	4	1	2	17
8	1	1	1	2	6
8	1	2	1	2	0
8	1	3	1	2	31
8	1	4	1	2	3
8	2	1	1	2	1
8	2	2	1	2	0
8	2	3	1	2	62
8	2	4	1	2	9
9	1	1	1	3	9
9	1	2	1	3	19
9	1	4	1	3	5
9	2	1	1	3	4
9	2	2	1	3	1
9	2	3	1	3	57
9	2	4	1	3	10

Note:

R(equest) S(trategy) Type: 1 = Direct Request, 2 = Desire Statement, 3 = Q-P, and 4 = Hint
Soc(ial) Dist(ance): 1 = positive value, 2 = negative value
Soc(ial) Stat(us): 1 = equal, 2 = unequal

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ACQUISITION OF LINGALA TENSE/ASPECT BY AMERICAN COLLEGE STUDENTS[1]

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In the acquisition of tense/aspect, no study in the literature is reported on the acquisition of Lingala tense/aspect by non-African learners. This paper discusses the results of a pilot study, undertaken in 1995, on the acquisition of Lingala as a foreign language by American students. Twenty undergraduate students at the University of Illinois at Urbana-Champaign (UIUC) were involved. The results showed that the overall rate of accuracy was below 59% and the most difficult tense/aspect types were the remote past {-a} and the present habitual {-àkà}, regardless of the number of semesters of exposure to Lingala.

1. Introduction

This paper is a preliminary study of the acquisition of Lingala tense/aspect by American students learning Lingala as a foreign language at the University of Illinois at Urbana-Champaign (UIUC). By acquisition, I mean the correct usage of tense/aspect in Lingala as a native speaker would in a given context. To measure this, I conducted a written translation of 36 English sentences (6 per tense/aspect type) into Lingala. The focus of the test was on tense/aspect. The score was the frequency count of correct translations. The English sentences were printed in a booklet form, one sentence on each page; the test was taken during class time, 50 minutes. There were 20 subjects and they formed two groups of 10: group 1 was in its fourth semester of Lingala and group 2 in its second semester. I used both descriptive and inferential statistics to analyze the data. The independent variables, group type and tense/aspect type, were in a nominal scale, the dependent variable, score, was in an interval scale.

There are at least six tenses[2] in Lingala, five of which are denoted by suffixes to the verb and one by a prefix. The immediate past,[3] the imperfect, and the remote past of Lingala have no correspondences in English, whereas the use of the remaining tense/aspects are the same in the two languages.The progressive aspect is similar to that of English. The Lingala tense/aspect markers (in boldface) are:

I. **-i** 'present': This tense is used to express an event that has just been completed before the moment of speaking, i.e., within minutes of the moment of speaking. It cannot be used for events that occurred earlier in the day. In Bantu syntax it is called the 'immediate past'. For example,

(1) He is fine.
Ye a-zal-**i** malamu.

(2) I just came from the market.
Ngai na-ut-**i** na zanda.

`II. **-aki** 'past': It is very restricted in standard Lingala and is used to describe events which have happened within a day with regard to the time of the utterance. It is called the 'imperfect' in Bantu syntax. For example,

(3) I went to Chicago this morning.
Ngai na-kend-**aki** Chicago lelo na ntongo.

III. **-áká** 'past': This tense is used to express events that occurred anytime in the past, i.e., beyond 24 hours, but whose effect is still being felt or whose relation to a present event can still be talked about. The event may be interrupted with a subsequent past action. It is the 'simple past' in Bantu syntax. For example,

(4) I went to Peoria yesterday.
Ngai na-kend-**áká** Peoria lobi.

IV. **-a** 'past': This tense is used to describe completed events that occurred in the distant past and for which there is, generally, no future recourse. The event, unlike the simple past, cannot be interrupted. In Bantu syntax this tense is called the 'remote past'. For example,

(5) Our dog has a broken leg.
Mbwa ya biso e-bukan-**a** lokolo.

V. **-àkà** 'habitual': Used to refer to re-occuring events in the present. This suffix is called the 'present habitual' in Bantu syntax. For example,

(6) I speak Lingala every day.
Ngai na-lob-**àkà** Lingala mikolo minso.

VI. **-ko-** 'future': This form is the most general future tense in Lingala and is used to describe events that will take place after the moment of speaking, even if an event will occur 3 minutes later. The event to be described must be probable. In Bantu syntax, this is called the 'simple future'. For example,

(7) I will go to Chicago.
Ngai na-**ko**-kende Chicago.

VII. **auxiliary + infinitive of main verb** 'present progressive': The auxiliary is **ko-zala** 'to be', which must be inflected in the present tense followed by the infinitival form of the main verb. This aspect describes an event at the moment of speaking.

The results showed that the groups were not dissimilar and an effect size for tense/aspect type showed that the difference in the group scores was statistically significant. Effect size also showed that length of exposure to a language in the classroom is not statistically significant and could therefore be considered not a critical factor in foreign language acquisition.

2. Literature review

To my knowledge, no study on the acquisition of tense/aspect in Lingala by Americans has not been reported in the acquisition literature. Although comparative studies of tense and aspect have been reported in the literature (Bardovi-Harlig 1992), most of these studies have compared English tense/aspect with tense/aspect in Asian and European languages, as in Andrews 1992 and Dhongade 1984. The two related to African languages are Machobane 1985 and Botne 1981, which are descriptive studies. As can be seen, nothing has been reported in the literature with regard to acquisition of tense/aspect of African languages. Some descriptive studies of tense/aspect of Bantu languages have been reported in the literature (Besha 1977, Bybee 1994, Johnson 1977, Mufwene 1978).

3. The study

3.1 Statement of purpose

In SLA studies, the focus has nearly always been on the acquisition of English or some European languages by Africans. To my knowledge, studies in the acquisition of tense/aspect in African languages, and especially in Lingala, by Americans has not yet been undertaken. Yet, Lingala and many African languages are taught in many universities in the United States, and Peace Corps personel are taught Lingala and other African languages when they are to serve in Africa. I hope such a study can help improve teaching not only in the U.S. and Europe, but also in Africa, since it concerns classroom foreign language teaching in both cases.

3.2 Research questions

The main research question is: How do American students learn Lingala tense/aspect. The other questions that follow are: (a) What tense/aspect type(s) will be difficult for them? (b) What tense/aspect type(s) will be easy for them? (c) What learning strategies do they employ? My guess/hypothesis will be that they will transfer their English (L1) tense/aspect usage into Lingala (L2).

In Lingala, there are three past-tense markers as shown in table 1: one for past events within a day, {-aki}; one for past events beyond 24 hours, {-áká}; and another for past events in the distant past, {-a}. In these cases, English will use one past tense, {past}. It is the use of the appropriate tense/aspect marker in Lingala that will be difficult for the subjects, because in English we do not need to make the three distinctions in the past, as in Lingala. With regard to the structure, the three affixes are suffixed to the verb, as in most English verbs, so this will not be a problem for the subjects, e.g., walk + {past} gives "walked" and 'bin'+ {-áká} gives 'bináká', the equivalent of "dance" + {past} = "danced". The main problem for the subjects will be the semantic distinction of the Lingala tense/aspect markers and the tones, especially the past tense ones. The closest past-tense/aspect form between English and Lingala is {-a}, hence it is likely to be the source of L1 transfer.

Table 1
Tense/aspect types in English and Lingala

	ENGLISH	LINGALA
PRESENT	-s, -ø	-i
		-àkà
PAST	-ed/vowel change/Ø	-a
		-áká
		-aki
FUTURE	will, V-ing	-ko-

Since Lingala is a tonal language and differs from English with regard to the use of the immediate past {-i}, imperfect {-aki}, simple past {-áká}, and remote past {-a}, the prediction is that most of the students will use these tense/aspects incorrectly in Lingala, e.g., the immediate past will be used to express English simple present and present perfect. The simple past {-áká} and the present habitual {-àkà} tense/aspect markers are distinguished by high and low tones, respectively (see Appendix 1 for Lingala sentences used in the translation and their English equivalents).

3.3 Research design

The research project was based on American students learning Lingala at the University of Illinois at Urbana-Champaign. The research was an intact group design — one group of subjects with two semesters of Lingala and another group with four semesters of Lingala. Both groups had the same instructor in the course of their learning Lingala. This design allowed me to make between-group and within-group comparisons. I also made causal inferences with regard to length of exposure influencing the acquisition of Lingala tense/aspect. The dependent variable was the test score from the translation test and the independent variable was the group type. The independent variable was measured as a nominal scale and the dependent variable as an interval scale. The moderator variable was the Lingala tense/aspect type.

3.4 Subjects

There were 2 groups of learners: group 1 was in its fourth semester of Lingala, group 2 was in its second semester. The total number of learners was 20 — 10 in each group. They were all native speakers of American English; all the subjects except two in group 1 had never had exposure to Lingala prior to their taking the Lingala class. One in group 1 had had exposure to Kiswahili before taking Lingala. There were 7 male and 13 female subjects in total: group 1 had 5 males and 5 females, group 2 had 2 males and 8 females.

3.5 Test design

I collected my data through a translation task; subjects translated 36 English sentences into Lingala. These sentences were printed in a booklet with one sentence on each page. Subjects worked at their own pace. but they had one class period (50-60 minutes) to translate all 36 sentences. Since subjects were bound by a time

constraint (50 minutes), I chose six short sentences of each tense/aspect type, using verbs and other vocabulary items they were familiar with. This was to avoid their concentrating on vocabulary instead of tense/aspect. The English sentences and their Lingala translations are given in Appendix 1; the tense/aspect markers in Lingala are in boldface. The test was scored by the class instructor and this experimenter.

3.6 Stimuli/materials

The sentences subjects saw were in English (the source language) and they had to translate them into Lingala (the target language). The sentences were printed in a booklet with various randomization orders for each subject. Each page had an English sentence and a line below it for the Lingala translation, as shown in Appendix 2.

3.7 Method/procedure

Subjects were given printed instructions on the cover page of the booklet. Sentences were randomly ordered for each subject and the booklets randomly presented to the subjects. The randomizing was to prevent subjects from trying to guess what the test was about and to eliminate their having to translate all the sentences in the same order. Presenting the sentences one at a time prevented subjects from seeing all the sentences at one time; this procedure also prevented subjects from making use of previous sentences, and the shuffling avoided imposing the same order of translation on all the subjects.

3.8 Data analysis[4]

To grade the translations, I coded a correct translation of verb usage as 1 and a wrong one as 0. The score for each subject was the total frequecy count of 1s and each subject could score between 0 and 36 points. The group score was the sum of the total of 1s for each subject in the group. With {-aka}, I considered a translation as correct when the appropriate tone for the tense/aspect type was marked but with the others, tone was not considered because it is not phonemic.

I used SPSS statistics software program for the descriptive and inferential statistics. I compared the translation scores of the two groups to see if length of exposure to a language in the classroom is a critical factor in acquisition. I calculated effect size for gender, group, and tense/aspect type. I also calculated the reliability coefficients for various variables under consideration as well as the rate of accuracy of tense/aspect usage. The dependent variable was the score on the translation test and the major independent variable was group type.

3.9 Results

The results are summarized below in Tables 2-7.

Table 2
Distribution of scores for all subjects

TENSE/ASPECT TYPE	M	SD	RANGE	k[1]	SKEW-NESS	KURTOSIS	RATE CORRECT	RELIA-BILITY
OVERALL	17.45	6.79	8-30	36	.10	-1.12	48.5%	.87
TA1 {-i}	4.15	1.04	2-6	6	-.02	-.18	75.0%	.26
TA2 {-aki}	3.55	2.06	0-6	6	-.32	-1.12	59.2%	.79
TA3 {-áká}	3.70	1.53	0-6	6	-.92	.51	61.7%	.57
TA4 {-a}	.90	1.25	0-4	6	1.28	.63	15.0%	.65
TA5 {-àkà}	1.90	1.97	0-6	6	.70	-.73	31.7%	.80
TA6 {-ko-}	3.25	1.83	0-6	6	-.58	-.34	54.2%	.71

[1] k is the maximum number of points that an individual can obtain on the test.
N = 20.

Table 3
Distribution of scores by group and tense/aspect type

TENSE/ASPECT TYPE	M	SD	RANGE	k[1]	SKEW-NESS	KURTOSIS	RATE CORRECT	RELIA-BILITY
GROUP 1 (4th semester; n = 10)								
OVERALL	17.70	7.76	8-30	36	.03	-1.35	49.2%	.90
TA1 {-i}	4.00	.82	3-5	6	.00	-1.39	66.7%	.04
TA2 {-aki}	3.30	2.45	0-6	6	-.21	-1.71	55.0%	.89
TA3 {-áká}	3.90	1.91	0-6	6	-1.37	1.01	65.0%	.74
TA4 {-a}	1.30	1.49	0-4	6	.86	-.78	21.7%	.68
TA5 {-àkà}	1.90	2.42	0-6	6	.96	-1.05	31.7%	.92
TA6 {-ko-}	3.30	2.00	0-6	6	-.83	-.23	55.0%	.78
GROUP 2 (2nd semester; n = 10)								
OVERALL	17.20	6.07	8-27	36	.19	-.95	47.8%	.85
TA1 {-i}	4.30	1.25	2-4	6	-.28	-.07	71.7%	.48
TA2 {-aki}	3.80	1.69	1-6	6	-.13	-.99	63.3%	.59
TA3 {-áká}	3.50	1.08	2-5	6	.00	-1.03	58.3%	.37
TA4 {-a}	.50	.85	0-26	6	1.36	.11	8.3%	.44
TA5 {-àkà}	1.90	1.52	0-4	6	-.26	-1.71	31.7%	.52
TA6 {-ko-}	3.20	1.75	0-6	6	-.38	.33	53.3%	.68

[1] k is the maximum number of points that an individual can obtain on the test.

Table 4
Distribution of scores by sex and tense/aspect type

TENSE/ASPECT TYPE	M	SD	RANGE	k[a]	SKEW-NESS	KURTOSIS	RATE CORRECT	RELIA-BILITY
				MALES (n = 7)				
OVERALL	17.29	6.16	10-24	36	-.12	-2.34	48.0%	.82
TA1 {-i}	3.86	.90	3-5	6	.35	-1.82	64.3%	-.07
TA2 {-aki}	3.29	2.29	0-6	6	-.14	-1.10	54.8%	.84
TA3 {-áká}	4.00	1.00	2-5	6	-1.40	3.00	66.7%	-.51
TA4 {-a}	1.29	1.60	0-4	6	1.05	-.38	21.5%	.78
TA5 {àkà}	1.86	1.95	0-5	6	.84	-.79	31.0%	.77
TA6 {-ko-}	3.00	2.38	0-6	6	-.31	-1.59	50.0%	.86
				FEMALES (n = 13)				
OVERALL	17.54	7.34	8-30	36	.15	-1.03	48.7%	.90
TA1 {-i}	4.31	1.11	2-6	6	-.29	.48	71.8%	.35
TA2 {-aki}	3.69	2.02	0-6	6	-.44	-1.01	61.5%	.76
TA3 {-áká}	3.54	1.76	0-6	6	-.67	-.22	59.0%	.76
TA4 {-a}	.69	1.03	0-3	6	1.27	.46	11.5%	.52
TA5 {àkà}	1.92	2.06	0-6	6	.73	-.55	32.0%	.82
TA6 {-ko-}	3.38	1.56	0-6	6	-.77	1.19	56.3%	.56

[a] k is the maximum number of points that an individual can obtain on the test.

Table 5
Effect size for tense/aspect type

	-i	**-aki**	**-áká**	**-a**	**-àkà**	**-ko-**
-i		.39	.37	1.15*	1.49*	.64
-aki			.08	1.60*	.82*	.15
-áká				2.01*	1.03*	.27
-a					.62*	1.53*
-àkà						.71*
-ko-						

* The effect size difference is at least half a standard deviation, hence of practical significance.

Table 6
Effect size for group and sex

	GROUP	
	GROUP 1	GROUP 2
GROUP 1	.07	
GROUP 2		

	SEX	
	MALE	FEMALE
MALE	.04	
FEMALE		

Table 7
Correlations between tense/aspect types

	-i	**-aki**	**-áká**	**-a**	**-àkà**	**-ko-**
-i		.57**	.40	-.23	.26	.45*
-aki			.52*	.12	.45*	.63**
-áká				.12	.36	.39
-a					.40	.47*
-àkà						.33
-ko-						

* Correlation is significant at .05 (2-tailed)
** Correlation is significant at .01 (2-tailed)

4. Summary and discussion

The results of this study show that length of exposure to a language in the classroom is not necessarily a critical factor in foreign language acquisition. The results in Table 2 show that the overall rate of accuracy for all the subjects was below average and also that the scores were distributed normally (skewness of .10), the negative kurtosis indicates that there were fewer extremely high or low scores than the normal distribution (flat peak), while the positive skewness indicates that the mean was higher than if the distribution were normal. Table 3 shows that the rate of accuracy for the fourth semester students, group 1, was 49% and that of the second semester students was 48%. The accuracy rate ranges from 21% to 66% in group 1 and from 8.3% to 71% in group 2. The reliability estimate of the two groups was acceptable, .90 and .85 for groups 1 and 2 respectively. The scores in groups 1 and 2 were normally distributed except for{-áká} and {-a} in

groups 1 and 2, respectively (normal distribution assumes skewness values of less than +/-1). Table 4 shows that the rate of accuracy for males was 48% and that of females was 49% with scores for both not normally distributed. However, the reliability estimates were acceptable, .82 and .90 for males and females, respectively. Table 5 shows the effect size for the different tense/aspect types while Table 6 shows that there was no significant difference between the two groups or between males and females. Table 7 shows the correlation between the tense/aspect types, the statistically significant correlations were between **-i** and **-aki**; **-i** and **-ko-**; **-aki** and **-áká**, **-aki** and **-àkà**; **-aki** and **-ko**; and then between **-a** and **-ko**.

With individual sentences, group 1 had more correct translations (15 sentences) than group 2 (12 sentences); both groups did equally well in the remaining 9 sentences. This result shows that there are great individual differences among the subjects. But when the results are conflated showing group score for tense/aspect type, group 2 outscores group 1 in 3 out of the 6 tense/aspect types used in the translation test (Table 3) and performed equally well in one {-àkà}. The second semester students did better than the fourth semester ones in the 'present tense' or technically the immediate past. This result gives partial support to the assumption that length of exposure to a language favors acquisition. Group 2 subjects did better than group 1 subjects on the immediate past marker, {-i}, maybe because they have retained set phrases in Lingala, since three of the six sentences (1, 4, 5) can be memorized as set phrases. They may have used the syntactic cues better than the group 1 students in the case of the imperfect, {-aki}. With the remote past, {-a}, subjects in group 2 had not studied this tense/aspect type, but all the same they were able to get some correct translations, whereas we would have expected them to get no translation correct. This could be due to the two students who were exposed to Lingala prior to taking this class and the one who had had a class in Kiswahili (a Bantu language, like Lingala). Maybe it is those students who read ahead of the class. We can say that group 1 outperformed group 2 in all tense/aspect types except for the immediate past, {-i} and the imperfect, {-aki}. But overall, the mean for group 1 and group 2 was not statistically significant and this raises serious concerns as to why this was so. This result could be due to the teaching style, presentation of the material in the textbook, or a combination of both. Do the students know English grammar well enough to take advantage of the similarities between the two languages? These are areas that need to be researched.

Subjects could have done better if they had taken advantage of some syntactic cues in translating the past tenses and the present habitual from English into Lingala. For the past tense, we have the time adverbials 'this morning', 'earlier today', 'a while ago', which indicate that the time of the event is within the day, hence the use of {-aki} in Lingala. The time adverbials 'yesterday' and 'last year' in the English sentences indicate that the the time of event was beyond 24 hours, hence expressed by {-áká} in Lingala. The time adverbials 'every day', 'daily','weekly' in the English sentences indicated a repeated action, hence expressed by {-àkà} in Lingala. Why did most of the learners not use this important strategy? Perhaps they do not knowhow to make use of them because they

have not been taught by their instructor or because it is not mentioned in the textbook. With the future, some subjects used two tense/aspects: {-ko-} and the present progressive in translating sentences 33 and 35. Since the present progressive can express future time in English, they transfered this idea into Lingala, where unfortunately there is a single future tense/aspect marker, {-ko-}.

On the whole, it is the remote past {-a} that was the most difficult tense/ aspect type to translate. This is not surprising because there are no syntactic cues to be used as strategies for this tense/aspect type. {-aki}, which is supposed to be the easiest of the three past forms (always used with a time adverbial indicating that the event is within the day), did not get the best translation, but rather {-áká}, which has some time adverbials that indicate that the time of event is beyond 24 hours, got the most correct translations. The wrong translations in the past tense mainly used {-a} instead of the other two forms. This is also evidence of L1 transfer, since in English the use of time adverbials in a past tense sentence is not very significant, whereas in Lingala it is very significant.

The prediction that subjects will find the past tense/aspect difficult is borne out because most of them knew that the Lingala sentences should be in the past, but determining which tense/aspect type they should be in was a problem for them. So most of them seemed to be guessing, by suffixing one of the three markers they knew to the verbs. Some subjects did not take advantage of syntactic cues in the English sentences. This is either because they did not know their significance, or because the subjects' motivation for learning Lingala was low, or even because they did not understand the sentences in English. The results show that it is the remote past {-a} and the present habitual {-àkà} that are the most difficult tense/aspect types to acquire, the easiest is the immediate past {-i}. The general hierarchy of tense/aspect in a descending order of difficulty is: {-a}, {-àkà}, {-ko-}, {-aki}, {-áká}, {-i}. This order corresponds to the mean score of the tense/aspect types in Table 2 in an ascending order. However, the hierarchy of difficulty by group is: {-a}, {-àkà}, {-ko-}/{-aki},{-áká}, {-i} for group 1 and {-a}, {-àkà}, {-ko-},{-áká},{-aki}, {-i} for group 2. This progression could be followed in teaching, implying that for the 'present' and 'past' tenses, the ones with the higher or highest rate of accuracy should be introduced first. Table 5 shows that the effect size of the mean difference for {-i} and {-àkà}, the present tense markers, is of practical importance, as is that of the past tense markers, {-a}, {-áká}, and {-aki} and these need to be addressed. However, a 2-tailed Pearson correlation (Table 7) shows no statistically significant relationship between the different 'present tenses' ({-i} and {-àkà}), but a significant correlation between the 'past tenses' {-áká} and {-aki}. There is rather a statistically significant relationship between the 'immediate past' {-i} and the 'past' form {-aki}, and also between {-i} and the future {-ko-}. There is also a statistically significant correlation between the 'future' {-ko-} and the 'past' {-aki} and {-a}. The significant correlation between the 'present tense' and the 'past tense' is with {-àkà} and {-aki}. Although it is difficult to say why there is a significant correlation between the tenses, a tentative explanation for the correlation within tenses may be that in the

past tense, some students were making use of the syntactic cues, hence the relationship between their performance with {-aki} and {-áká}.

5. Conclusion

The results of the study have shown that (a) in L2 learning L1 transfer is part of the learner's strategy; (b) the rate of accuracy of tense/aspect usage is below average even after three semesters of exposure; (c) the length of exposure to the foreign language is not a crucial factor in proficiency; (d) the level of difficulty is similar for both groups in this study.

6. Implications for future research

In the future, it will be good to go through the textbook to see how tense/aspects are presented, audit the classes to see how the instructor teaches tense/aspect and then have a questionnaire and/or interview with learners to see how motivated they are and what they have understood in the class. The same translation test can be given to the Kiswahili classes with the same amount of language exposure to see if the results will be similar, since they are both Bantu languages. For future research, teaching materials could be based on the proposed hierarchy of difficulty, the instructors should be trained to use learning strategies like syntatic cues in their teaching, especially those who are not in linguistics or language-pedagogy programs. Equal sample sizes for males and females for both groups should be used to see if there is any gender effect. Similarly, it would be interesting to see if there is an age effect. The division of the past tense markers into three should be maintained, but the explanation with regard to the meaning should change, especially for {-áká} and {-a}. We could say that {-a} is used to express the result of a past event and {-áká} is used to express the time of an event (when there is a cue) or the result of an event (when there is no cue) beyond 24 hours. This may not solve the problems mentioned above, but could be the begining of a solution. The term 'imperfect' should not be used for {-aki} because it can confuse the students. It should be called a 'past' tense, and students should be taught to recognize it with the syntactic cues that signal it. As for the 'present', technically called the 'immediate past', it should be presented in two parts: (a) a 'present' tense and (b) 'present perfect', which has a close counterpart in English. If this is done, students could be told that {-i} is used with 'present' tense and with actions that in English are preceded by 'just'. For teaching purposes, it is better to structure the tense/aspects as much as possible to correspond to the L1 categories: present, past, future. This will enable the learners to make use of their previous knowledge in the new learning situation.

NOTES

[1] This paper was presented at the first ALTA Conference held at the University of Wisconsin-Madison in April 1997.

[2] Information concerning tense/aspect is taken from Bokamba 1981.

[3] The technical terms used for tense/aspect, e.g. 'immediate past', are those used in Bantu syntax and grammar.

[4] Raw scores for subjects and groups are presented in Appendix 3.

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APPENDIX

The English sentences to be translated and their expected Lingala equivalents

I. Immediate past (-i).

1. He is fine.
   Ye a-zal-**i** malamu.
2. I just came from the market.
   Ngai na-ut-**i** na zanda.
3. Ted hit me.
   Ted a-bet-**i** ngai
4. Where are you?
   Yo o-zal-**i** wapi?
5. I love you.
   Ngai na-ling-**i** yo
6. They just wrote a letter.
   Bango ba-kom-**i** munkanda

II. Imperfect (-aki).

7. I went to Chicago this morning.
   Ngai na-kend-**aki** Chicago lelo na ntongo.
8. They ate chicken a while ago.
   Bango ba-liy-**aki** nsoso mwa kala.
9. We bought a car early today.
   Biso to-somb-**aki** muntoka na ntongo.
10. I taught this morning.
    Ngai na-lakis-**aki** lelo na ntongo.
11. Ted saw Tisia this morning.
    Ted a-mon-**aki** Tisia lelo na ntongo.
12. They talked to him earlier today.
    Bango ba-solol-**aki** na ye lelo na ntongo.

III. Simple past (-aka).

13. I went to Peoria yesterday.
    Ngai na-kend-**aka** Peoria lobi.
14. You taught Lingala last Monday.
    Yo o-lakis-**aka** Lingala moko moleki/mwa mosala.
15. Lawrence bought beer.
    Lawrence a-somb-**aka** masanga.
16. Biko and Eyamba wrote to Lawrence.
    Biko na Eyamba ba-komel-**aka** Lawrence.
17. Moses called home yesterday.
    Moses a-beng-**aka** mboka lobi.
18. They danced to African music.
    Ba-bin-**aka** misiki ya afrika.

IV. Remote past (-a).

19. Our dog has a broken leg.
    Mbwa ya biso e-bukan-**a** lokolo.
20. Many people went to Chicago.
    Bato mingi ba-kend-**a** Chicago.
21. Who did Lee marry?
    Lee a-bal-**a** nani?
22. Martin Luther King is dead.
    Martin Luther King a-kuf-**a.**
23. Mary divorced Paul.
    Mary a-boy-**a** Paul.
24. The war is finished.
    Bitumba e-sil-**a.**

V. Present habitual (-aka).

25. I speak Lingala every day.
    Ngai na-lob-**aka** Lingala mikolo minso.
26. She goes to school every morning.
    Ye a-kend-**aka** sukulu/kelasi ntongo inso.
27. He passes here every day.
    Ye a-lek-**aka** awa mikolo minso.
28. Catrese reads weekly.
    Catrese a-tang-**aka** poso inso.
29. She cooks every day.
    Ye a-lamb-**aka** mikolo minso.
30. You drive your car daily.
    Yo o-kumb-**aka** muntuka mwa yo mikolo minso.

VI. Simple future (-ko-).

31. I will go to Chicago.
    Ngai na-**ko**-kende Chicago.
32. She will eat chicken.
    Ye a-**ko**-liya nsoso.
33. I am going to buy a car.
    Ngai na-**ko**-somba muntuka.
34. Will it rain tomorrow?
    Mbula e-**ko**-beta lobi?
35. Is she coming the day after tomorrow?
    Ye a-**ko**-yaa ndele?
36. He will graduate in May.
    Ye a-**ko**-silisa na sanza ya mitano.

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PRENUCLEUS GLIDES IN KOREAN

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This paper argues that prenucleus glides in Korean are part of the onset, forming a secondary articulation on the initial consonant. The present analysis assumes a simpler syllable structure than the previous ones and provides an account for the wider range of phonological phenomena involving glides using the feature-geometric representation.

1. Introduction

In the Korean language, glides are allowed only in the prenucleus position. On the analysis of prenucleus glides in Korean, there have been two proposals. Kim-Renaud 1978, Sohn 1987, Choe 1986, Kim & Kim 1991, and Nam & Southard 1994 argue that the Korean glides are a part of the nucleus. However, other scholars such as Lee 1982, Ahn 1986, and Lee 1993 favor the idea that the Korean glides are a part of the onset, not of the nucleus. The former will be referred as the Nucleus Hypothesis (NH) and the latter as the Cluster Onset Hypothesis (COH). Lee 1993 calls this the Onset Hypothesis. I add the 'cluster' to differentiate it from the proposal which will be presented in this paper. Another reason for the addition of 'cluster' is that the onset hypothesis regards a sequence of a glide and a preceding consonant as a consonant cluster.

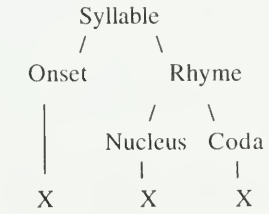
In this paper, I will argue that glides are a part of the onset. The hypothesis will be called the Single Onset Hypothesis (SOH). The difference between the SOH and the COH is that in the SOH a consonant and the following glide do not form a consonant cluster but are just one complex segment. By a complex segment I mean (1a), but not (1b) nor (1c).

(1) a. Place
/ \
*Cor Dor

b. X
/ \
Root Root

c. Lar
/ \
[+H -H]

(2)



This analysis leads to the more general claim that every constituent of a syllable is composed of just one segment; onset, nucleus or coda each has only one position as (2) shows. Following feature geometry, each segment is represented as a feature tree in this paper.

The rest of the paper is organized as follows. In section 2, the previous analyses of the Korean glides are reviewed. In section 3, the problems with these analyses are pointed out. In section 4, a new analysis is presented. In section 5, I illustrate the explanatory power of the present analysis. In the last section, I make some concluding remarks.

2. Previous studies

There has been much controversy over the analysis of glides in Korean. There are two views. The first view is that a glide can be assigned to one specific structure, under the nucleus or under the onset. The second view is that a glide can be anywhere in a syllable structure depending on the word in which a glide occurs.[1] This paper will take the first view. The second view will not be followed for three reasons. First, the first view presents a more restricted theory in the sense that it does not allow a rare structure which permits a rising diphthong. Second, for the Korean data we do not need all the other structures permitted by the second view other than a structure with a glide in the onset. Third, one of the structures admitted under the second view, the structure in which a glide is in the nucleus, is not acceptable for reasons which will become clear below.

2.1 Arguments for the Nucleus Hypothesis (NH)

First of all, let us look at the arguments for the NH, which are from Kim & Kim 1991 and Sohn 1987.

First, there is no co-occurrence restriction between an onset consonant and a following glide, but there are constraints on the possible coda consonant clusters and complex nuclei. According to Kim & Kim 1991, any consonant can come before glides in Korean, while only a small number of consonant clusters are allowed to occur in coda position. Also there is negative restriction on the possible complex nuclei such as *ji or *wu. This suggests that an onset consonant and a following glide are not within one node in a syllable.[2] The assumption here is that if the more restricted constraint holds between two units, then these are closer units.[3]

Second, Korean has a phenomenon called Consonant Cluster Reduction (CCR). This phenomenon is seen as a strong argument for the NH. The NH assumes that there is only one consonant both in the onset and in the coda. Therefore, the sequence of three consonants cannot be parsed in the syllable structure properly. One of the repair mechanisms put into operation is Consonant Cluster Reduction, which deletes the second consonant in a sequence of three. This is illustrated in (3).

(3) kaps 'price: underlying form' kaps-i 'NOM' kap-man 'price only'
nəks 'spirit: underlying form' nəks-i 'NOM' nək-to 'soul also'
antç-[4] 'to sit: underlying form' antç-ətta 'PAST' an-kəla 'IMP'

When a word ending underlyingly with a consonant cluster is followed by a word beginning with a consonant as in *kaps-man*, the resulting derived word comes to have three consonants. Then, one of the consonants, *s*, is deleted by the operation of Consonant Cluster Reduction. Thus, the resulting word is *kapman*. In contrast, when the word is followed by a vowel-initial suffix, *kaps-i*, both members of the consonant cluster survive, *kapsi*.

If a glide is in the onset, then -CCG- should be considered as a possible input to the Consonant Cluster Reduction, because they make a sequence of three consonants. However, CCR does not apply, as is seen in (4). That is, if *lpj* or *lkw* are considered a sequence of three consonants, one of three consonants must be deleted.

(4) o**l-pjə** 'this year's crop'
si**l-kwa** 'fruit'

The examples in (4) are interpreted to show that glides are not in the onset but in the nucleus.

Third, the phenomena of ideophones also provide an argument in support of the NH. The ideophone is formed by reduplication of the base as shown below.[5]

(5) k'opul-k'opul 'winding'[6]
pintung-pintung 'idling'

There are also partially reduplicated ideophones, as in (6), in which everything except the onset consonant is reduplicated.

(6) aki-tçaki 'sweet'
osun-tosun 'friendly'

When the words beginning with CGV- are the base for the partial reduplication, every segment except word-initial C is reduplicated, suggesting that the glide is not a part of the onset. That can be seen in (7). That is, if the glide is in the onset, then it should disappear in the partially reduplicated form. However, it survives.

(7) jam-ŋjam 'tasty'[7]
jək-ljək 'vivid'
joŋ-rjoŋ 'teasing'

The fourth piece of evidence for the Nucleus Hypothesis comes from a language game in which CV is inserted after the first CV of each syllable. The C in the inserted CV is always *p*. V copies the vowel from the base syllable. Then, if there is a coda consonant, it is attached to the end of the inserted CV. A simple rule for this change would be $C_1V_1C_2 \rightarrow C_1V_1 - pV_1C_2$. This is illustrated in (8).

(8) p^hato → p^ha-pa to-po 'waves'
kongt$ç^h$ɛk → ko-pong t$ç^h$ɛ-pɛk 'notebook'

(9) shows what happens in words that contain glides. This language game shows where the prenucleus G belongs.

(9) kwənse → kwə-pwən se – pe 'power'
jaku → ja-pja ku – pu 'baseball'

According to Sohn, and as (8) illustrates, a glide is repeated in the inserted CV.[8] This means that a glide is not a part of the onset. Otherwise, along with the onset consonant, it should be replaced by *p* in the language game because the entire onset is replaced by *p* in the language game.

The fifth argument for the Nucleus Hypothesis is found in the pronunciation of the liquid *l*. The *l* is changed into [r] in pre-vocalic position (= syllable-initial onset position) but it remains [l] in coda position. (10) demonstrates this alternation.

(10) kil 'street' kil – to [kilto] 'street also' kil-e [kire] 'LOC'
tal 'moon' tal-pitçʰ [talpit][9] 'moonlight' tal-i [tari] 'NOM'

This *l* is changed into [r] without exception, even when *l* is followed by a glide-initial morpheme, supporting glides as a nucleus element. We can see this in (11).

(11) il-jo-il 'Sunday' [irjoil] *[iljoil]
kɨl-wəl 'writing' [kɨrwəl] *[kɨlwəl]

The last supporting evidence for the NH is that, in Korean, no consonant cluster can occur in either the onset or the coda. As is seen in (12), some words have a consonant cluster in either the onset or the coda in their underlying representation. These words, however, do not retain two consonants at the surface level. No matter where the cluster is, one of the consonants has to be deleted. That is, the Korean syllable template has neither CCV(C) nor (C)VCC.

(12)

UNDERLYING FORM	SURFACE FORM
stək 'rice cake'[10]	[tʼək][11]
skita 'be in between'	[kʼita]
nəks 'spirit'	[nək]
talk 'hen'	[tak]

If we accept the glide as a member of the onset,[12] then we need the restricted condition: the consonant cluster is allowed only in the onset and the second member of the cluster has to be a glide. Assuming the NH, we do not need to admit consonant clusters in the syllable template of Korean.

2.2 Arguments for the Cluster Onset Hypothesis (COH)

Let us consider arguments for the Cluster Onset Hypothesis advanced by Lee 1993.

First, we can see why glide formation and glide insertion are triggered in Korean if we assume that a glide provides an onset. Glide formation (13) and insertion (14) are natural syllable repair mechanisms when a hiatus happens to occur. In the NH, it is difficult to explain why a glide is inserted between vowels.

(13) Glide formation

tçʰiu-ə [tçʰiwə] 'to clean – IMP'
o-a [wa] 'to come – IMP'

(14) Glide insertion

Minsu-a	[minsuja]	'Oh, Minsu'
Minsu-Vocative		

Second, the vowel harmony feature [RTR][13] does not affect the glide. If the glides are in the nucleus, they should be the targets for the harmony. However, the glide is not affected, as we can see in (15).

(15)	wiŋ wiŋ	→ **wɛŋ wɛŋ**	*oɛŋ oɛŋ	'buzzing'
	sjuŋ sjuŋ	→ **sjoŋ sjoŋ**	*sɛoŋ sɛoŋ	'whizzing'
	k^hwi khwi	→ k^h**wɛ** k^h**wɛ**	*k^hoɛ k^hoɛ	'foul smelling'

Third, the advocates of the COH doubt the reliability of the language-game data presented by Kim & Kim 1991 and Sohn 1987 under the NH. According to Lee 1993, Korean speakers produce *ja-pa ku-pu* as the only correct form for *jaku*. To them *ja-pja ku-pu* is not a possible form.

Fourth, contrary to the arguments of the NH, there exists a co-occurrence restriction between a consonant and a following glide: **pw* and **mw* are not good clusters, though *pu* and *mu* are possible. Similarly, **sj* and **tç^{h}j* are not possible combinations, although *si* and *tç^{h}i* are well-formed.[14] These show that glides are different from vowels in the nucleus.

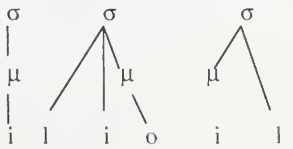
The co-occurrence restriction holding between a glide and a vowel, such as **ji, *ji, *wu,* and **wo*,[15] can be explained by a universal tendency, such as avoidance of nonoptimal sounds.[16] Thus, this restriction cannot be used to support the NH.

Having observed that the COH is observationally more adequate than the NH, let us now turn to how the COH can handle the data presented as evidence for the NH.

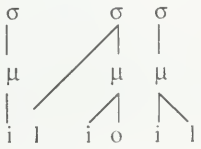
First, as for Cluster Simplification seen in (3), Lee 1993 argues the COH can also handle (3). According to his explanation, Cluster Simplification simply does not apply when the glide is involved because the syllable template of Korean allows a consonant-glide cluster in the onset.[17]

Second, Lee's account of the l/r alternation in (10) and (11) is that both (10) and (11) obey the Maximal Syllable Onset Principle. The representation by Lee is in (16). Thus, the data are not incompatible with the COH. Under both the NH and the COH approaches, *l* is in the onset position, where it is pronounced as [r] because it meets the structural description of the *l* to [r] rule.

(16) a. COH approach[18]



b. NH approach



Third, with regard to the reduplication in ideophones in (6), Lee claims that those are not a case of partial reduplication, but rather of total reduplication. After that, the words are subject to two other subsequent phonological rules independently required in Korean phonology. The first of these is the nasalization of liquids; liquids are changed into the homorganic nasal on the surface level when they occur in word initial position, as we can see in (17).

(17)	$k^hwɛ$-**l**ak	'pleasure'	**n**ak- wən	'paradise'
	ki**n**-**l**o	'work'	**n**o-tong	'labor'

The second of these rules is the deletion of a nasal sound in word-initial position followed by a front vowel or front glide.[19] This is exemplified in (18).

(18)	su-**nj**ə	'nun'	**j**ə-tça	'woman'
	sip-**nj**ən	'10 years'	**j**ən-mal	'year end'

The derivation of *joung-rjoung* is given in (19).

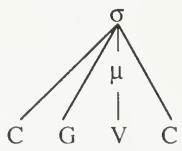
(19)	rjong	underlying form
	rjong-rjong	full reduplication
	njong-rjong	nasalization
	jong-rjong	nasal deletion

Giving this analysis, Lee 1993 points out that 'we do not have a single ideophone of this type, which has a consonant other than a liquid or an alveolar nasal. Given such restrictions, we may say that the deletion of liquids or an alveolar nasal may not be the result of the ideophone-specific onset deletion process.' We will see why this analysis presents difficulties in section 3.2.

3. Problems with the previous studies

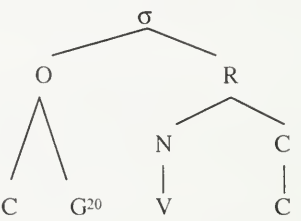
Both the NH and the COH make strong arguments as we observed above. However, both the NH and the COH encounter a theoretical problem. We need to consider the syllable structures suggested up to now for the Korean glides in order to grasp the theoretical consequences of these analyse.

(20) a.



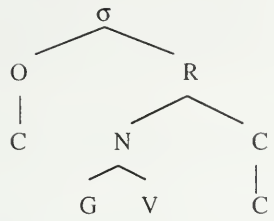
Lee 1993

b.



Ahn 1986
Lee 1982

c,



Kim-Renaud 1978
Sohn 1987
Kim & Kim 1991

All the above structures reserve a separate position for a glide, no matter where it is located (i.e., in the onset or in the nucleus). The first two structures can be subsumed into one structure containing the branching onset. Roughly, we can classify the above structures into two kinds: one has a branching nucleus and the other has a branching onset.

3.1 Problems with the NH

The problems with the NH are clearly pointed out by Lee 1993. In this subsection, two theoretical problems and two more factual problems will be added to Lee's.

Let us consider first the theoretical problem. The NH postulates a branching nucleus with G and V. This has been called Short Rising Diphthong. But Short Rising Diphthong is very rare and is at best controversial. For example, Fu 1990, Harris 1983, and Kim & Kim 1991 argue for the diphthongal analysis of a prenucleus glide for Chinese, Spanish, and Korean respectively. However, these are challenged by Duamnu 1990, Carreira 1988, and Lee 1993, respectively. For French, Scullen 1993 proposes the onset analysis.

The second problem is that the structure with a branching nucleus breaks the one-to-one relationship between a segment and a constituent of a syllable, giving rise to a more complicated structure. Theoretically, all else being equal, there is no reason to accept the more complicated model.

In addition to the above-mentioned theoretical problem, the NH has some factual problems. First, contrary to what has been assumed in the NH, very strict co-occurrence restrictions hold between a consonant and a following glide. These restrictions are more restricted than those holding between a glide and the following vowel.[21]

The vowel inventory of Korean is [i, e, ɛ, ə, ɨ, u, o, a].[22] (21) shows the possible glide-vowel combinations.

(21) Possible GV sequences in Korean[23]

a.	je, jɛ, jə, ju, jo, ja[24]	*ji, *ji
b.	wi, we, wɛ, wə, wa[25]	*wu, *wo, *wi

As we saw in the previous section, these restrictions are explained by the more general avoidance of non-optimal sounds, and do not provide an argument in support of the NH. Now, let us see what restrictions hold for a consonant and a following glide, as shown in (22).

(22) Impossible CGV sequences[26] in Korean[27]

* t, t^h, t', tç, $tç^h$, tç', s' + jV [28]

* p p^h, p', m + wV[29],

The NH does not predict these co-occurrence restrictions between a consonant and a following glide.

The second phenomenon that the NH cannot explain is rhyming in Korean poetry. Under the NH, it is predicted that $[_{rhyme}GV(C)]$ in [(C)GV(C)] is a rhyme, but this prediction is not consistent with the facts. (23) shows a characteristic rhyming pattern of a famous modern poet named Yuk-Sa Lee analyzed by the Korean scholar Sang-Ho Lee 1984. The onset and the prenucleus G do not affect the rhyming pattern at all, that is, *nja* and *da* rhynme in (a), *lja* and *la* rhyme in (b), and *njo* and *ko* rhyme in (c).

(23) Rhyming pattern (Sang-Ho Lee 1984)

a. nja-o-ga-o-da	in Twilight[30]
b. lja-la-ta-la-la	in Wild Land[31]
c. la-njo-la-la-ko	in Spotted Cat[32]

The rhyming patterns in (23) indicate that glides play no role in rhyming. This shows that the glide in Korean is not in the rime, but in the onset. Proponents of the NH might try to account for the rhyming within the NH. For example, according to Chao 1934, a syllable is comprised of an initial and a final. Then the final is composed of a glide and a rime, which in turn has a nucleus and a coda. The NH would require some such additional and unjustified stipulation, which is not needed in the OH.

3.2 Problems with COH

There are also facts that cannot be accounted for by the COH, which considers C and G as a consonant cluster. First, consider the branching onset structure, which is a tenet of the COH. In Korean, consonant clusters are not allowed in either the onset or the coda. Underlyingly, a very small number of consonant clusters occur in the coda, but these clusters are simplified before they appear at the phonetic level.[33] The only possible surface syllable structures for Korean are V, CV, VC, and CVC. If we consider a glide to be in the onset, taking a separate position, then we must explain why there is no other consonant cluster. Consider the generalization made by Duanmu 1990, given here in (24).

(24) There is a cross-linguistic tendency that if a language allows an onset cluster C_iC_j, where the sonority distance between them is not the largest, then it should allow an onset cluster C_iC_j, where the sonority distance is larger (Greenberg 1964, Harris 1983, Selkirk 1984, Steriade 1982).

If we view a prenucleus glide and the preceding consonant as a consonant cluster, *lj* and *nj* are clusters. Duanmu's generalization predicts that Korean should, therefore, have other consonant clusters, with sonority distances larger than those of *lj* and *nj*, such as **pl* or **pr*. The sonority scales for the sounds relevant here is

that stops are 1, nasals are 2, liquids are 3, and glides are 4. However, there is no single consonant cluster in Korean except a cluster of a consonant and a glide. This is a serious problem for the COH. In section 5, we will examine this issue in more detail.

Second, the COH cannot explain the language-game data presented by the NH and illustrated in (8) and (9); additional examples are given in (25). Koreans make two forms in the language game, (25) and (26). The only data the COH can account for is (26). The COH cannot explain (25), because in (25) the inserted CV does contain a glide. If a glide is in the onset, it should be replaced by *p* along with the other consonant in the onset.

(25) LANGUAGE GAME I
a. hakkjoe kajo 'go to school'
ha-pak kjo-p**jo** e-pe ka-pa jo-p**jo**
b. kwanjək ij hwal 'arrow in the target'
kwa-p**wa** njə-p**jə**k ij-pij hwa-p**wa**l

(26) LANGUAGE GAME II
a. hakkjoe kajo 'go to school'
ha-pak kjo-p**o** e-pe ka-pa jo-p**o**
b. kwanjək ij hwal 'arrow in the target'
kwa-p**a** njə-pək ij-pij hwa-p**a**l

Third, the COH does not account for the ideophone forms in (27), which contain consonants other than liquids and nasals. The only consonants expected to participate in the special partial reduplication are liquids and nasals under the COH.[34] The data in (27) should not exist according to the COH. The rules for the special partial reduplication apply only to nasals and liquids.

(27) joli-**tç**oli 'here and there' or 'this way and that way'
jomo-**tç**omo 'various sides'
jomil-**tç**omil 'meticulous'

The evidence against the COH becomes even more compelling when considering the forms in (28), which contain *w* in the reduplicated part instead of *j*. The COH does not anticipate this occurrence, because the COH relies on the deletion of nasal sounds before a front vowel or a front glide to explain the partial reduplications in (7).[35]

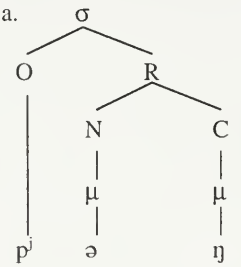
(28) **w**eŋkilaŋ-teŋkilaŋ 'clinking'
walkatak-talgatak 'rattling'
waktal-paktal 'rudely'

(27) and (28) also challenge the NH. That is, *jam-njam* cannot be evidence for the NH, because we cannot be certain that the glide in *jam* comes from *njam*, since in (27) and (28), a glide appears in the reduplicated part even though the base words do not have glides.[36]

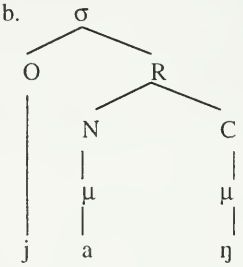
4. The present analysis

My analysis agrees with the COH in that a glide is treated as a part of the onset. However, I also make three additional proposals. First, a glide in Korean is not a separate segment if another consonant precedes it. In such cases, the glide is a seconday articulation and does not form a consonant cluster. Thus, the representation of *pʲəŋ* 'bottle' would be as in (29a). (29b) is the syllable structure of a word *jaŋ* 'a sheep' to show the structure when a glide is in the onset without another consonant.

(29) a.



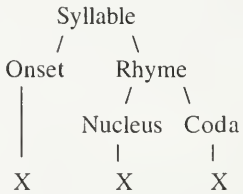
b.



A consonant cluster Cj and a consonant with secondary articulation C^j are expected to have different timing structures. According to Ladefoged & Maddieson 1996, the total duration of a consonant with secondary articulation does not equal that of a sequence of two articulations in a cluster. Therefore, the claim that the Korean glide is a secondary articulation can be tested phonetically by measuring the time of C^G and CC and compare them. However, the comparison would not be easy, because Korean has no consonant clusters at all if we assume glides are a secondary articulation.

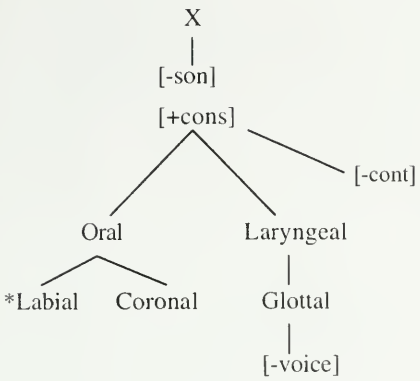
Second, along with the complex C^G with a secondary articulation, I adopt a simplified model for Korean syllable structure, which has only one position per syllable constituent as seen in (2), repeated in (30). Notice there is neither a branching onset, a branching nucleus, nor a branching coda. Every terminal node dominates one segment. That is, a syllable can have at most three slots.

(30)

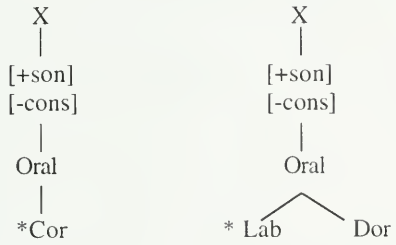


Third, C^G is represented in a feature tree. As an illustration, the tree for p^j is given in (31a). To contrast the structures of plain glides, *j* and *w*, their structures are given in (31b).

(31) a. **p^{j}**



b. *j* *w*



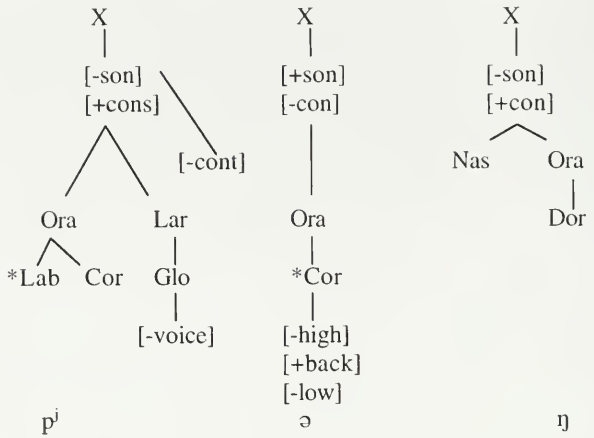
5. Illustration of the present analysis

In the following we will see how the present anaysis works. How does this new proposal explain the phenomena involving Korean glides?

First, concerning phonotactic restrictions, we can predict which combinations are allowed to be considered one segment, and which ones are not. For example, as is exemplified in (32), *p* and *j* can form one segment because the former is articulated by the labial and the latter by the coronal articulator. In this paper I follow the assumptions of the current feature geometry that every articulator can occur once in a sound.[37]

However, if a consonant and a glide are both articulated by the labial, then it is difficult to express this combination within the current feature-geometry framework. In fact, it is precisely these CG sequences that are impossible in Korean, as shown in (33). The consonants that cannot precede *j* are all coronal obstruents, while those that cannot precede *w* are labials.

(32)



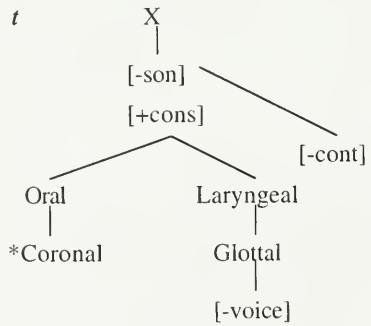
(33) Impossible CGV sequences in Korean[38]

a. * t, tʰ, t', tç, tçʰ, tç', or s' + jV[39]

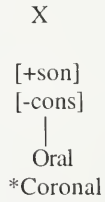
b. * p pʰ, p' or m + wV[40],

The feature-geometric representation of *t* and *j* are given in (34).

(34) a. *t*



b. *j*



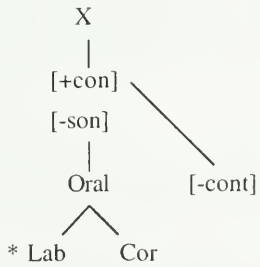
As these two sounds have Coronal as their articulator, they cannot be combined into one segment. The same is true of the other coronal consonants. In (33b), the consonant is a labial sound and the glide is also a labial. As expected, they cannot be a single segment. The analysis of this paper explains why there should be a

gap in the combination of a consonant and a glide in Korean, and also describes which combination is possible.

If advocates of the COH were to offer an explanation for the fact that some consonant clusters are allowed, but some are not, they would necessarily have to appeal to the sonority scale. But this approach inevitably encounters the problem. For example, p^j and l^j are possible consonant clusters, but p^l is not in Korean. Suppose the sonority of stops is 1, that of liquids is 2, and that of glides is 3. The sonority distances of *pj, pl,* and *lj* are 2, 1, and 1 respectively. Then how can the COH explain why l^j is allowed, but p^l is not, in terms of sonority? This sonority argument is very weak.

Under the SOH, the nonoccurrence of p^l, p^r, m^l, p^n, and the other combinations of consonants is easily explained. According to Sagey 1986, as cited by Duanmu 1990, the structure in (35) is interpreted by default as [p^j], rather than [p^l], because the universal default values for a secondary articulation are [-cons] and [+son]. We also assume a bare secondary articulator, which does not dominate any offspring node.

(35)



Second, nothing special needs to be said about the Consonant Cluster Reduction, which was presented in (4) and is repeated in (36).

(36) ol-pjə 'this year's crop'
sil-kwa ' fruit'

Even though we consider the glide as being in the onset, p^j or k^w is just one segment. Thus, it is natural for the words in (36) not to be subject to the reduction rule. This was a little problematic for the COH because it posits two segment positions in the onset.

Third, the SOH can also account for the entire range of the data from the language game. For the speakers who discard a glide in the inserted CV, the rule governing the game is a deletion of the whole onset. For the speakers who keep a glide in the inserted CV, the governing rule is a deletion of only the primary articulator from the onset segment.[41]

Fourth, when we use the feature tree, we do not need to refer to the higher node, such as the nucleus, for vowel harmony. Referring to a higher node is inevitable in the COH. The explanation provided by Lee 1993 is the following: Korean vowel harmony involves spreading of the feature [RTR] to the nucleus segment. The reason harmony process skips the glide is that a glide is in the onset, not in

the nucleus. Under feature geometry, the representations of every vowel should have the Dorsal articulator as its major articulator while a glide has Cor or Lab as its primary articulator. The [RTR] feature just spreads to the primary *Dor and a glide is ignored by this spreading.

Fifth, consider the partially reduplicated ideophones of (27) and (28), repeated in (37) and (38). The previous analyses from the COH or the NH did not handle these data, as I pointed out above.

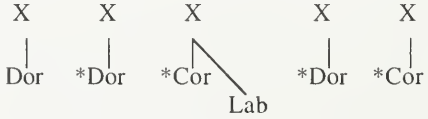
(37)	joli-tçoli	'here and there' or 'this way and that way'
	jomo-tçomo	'various sides'
	jomil-tçomil	'meticulous'
(38)	weŋkiɬaŋ-teŋkiɬaŋ	'clinking'
	walkatak-talgatak	'rattling'
	waktal-paktal	'rudely'

My explanation for these data is as follows. First, delete the onset. Second, insert a minimal [+cons] element to satisfy the Onset principle, which is *w* before [-round] vowel and *j* before [+round] vowel.[42] In *jam-njam*, even though the vowel is [-round], *j* appears. This might appear to be an exception, but it is not: *w* is replaced by *j* because **wam* is not a permitted sequence in Korean.[43] The derivation is given in (39).

(39)	nʲam	base
	am-nʲam	partial reduplication for ideophone
	wam-nʲam	insertion of [+cons] element
	jam-nʲam	dissimilation

Sixth, regarding the *l*/*r* alternation (recall (10) and (11)), the SOH gives a simple explanation. Under the SOH, the segment is represented in the feature tree. The features of l^w are not in strictly linear order. That is, l^w is not a combination of *l* and *w* in order. This is followed from one of the basic assumptions of non-linear phonology, to which feature geometry belongs. The relevant assumption here is that a phonological representation is not linear but multi-dimensional, placing different gestures at different tiers. Thus *l* can see the following vowel in spite of Lab of *w*. *l* in (40) meets the structural description of the *l* to [r] rule. As a result, it is changed into [r].

(40) 'writing'



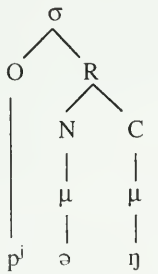
Seventh, in respect to the glide formation and insertion in (13) and (14), the explanation of the SOH is almost the same as that offered by the COH. A glide is a part of the onset when it is preceded by another consonant, while it itself is an onset when it is the only member of the onset. Thus, it is an expected phenomenon that a glide is inserted or formed to resolve the hiatus when two vowels happen to occur side by side.

I turn now to potential problems of the SOH . First, for the speakers of the Chonnam dialect, the length of the vowel is phonemic, as shown by the Chonnam minimal pairs in (41). Recall that the syllable structure I propose has only three positions in it. The words such as *pʲə:ŋ* , *mʲə:n*, and *jə:nki* seem to need four positions within a syllable (two for vowel length).

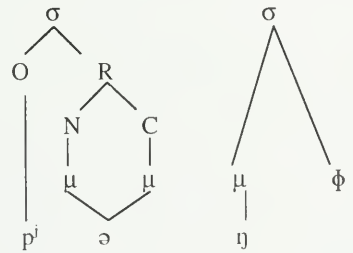
(41)	pʲə:ŋ	'disease'	pʲəŋ	'bottle'
	mʲə:n	'face, aspect'	mʲən	'cotton, noodle'
	jə:nki	'performance'	jənki	'smoke'

A possible solution to the Chonnam dialect case is illustrated by the representations in (42) and (43). As we do not allow two places under one constituent of a syllable, the coda of *pʲə:ŋ* has no place to be linked to in the first syllable. Therefore, it forms an independent syllable with zero rhyme in (43). The analysis I follow in this paper is different from the traditional view of syllable structure; for arguments in favor of the new analysis, see Harris (1994:83) and Burzio (1994:55-65).

(42) pʲəŋ 'bottle'

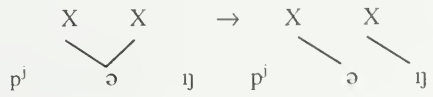


(43) pʲə:ŋ 'disease'



The prediction from the above representation is that the stranded consonant can be resyllabified with the following vowel when this word is suffixed by a vowel-initial morpheme. However, when this is followed by a consonant-initial morpheme, the stranded element cannot find a place in the second syllable to be linked to, thus, *ŋ* must be syllabified with the first syllable. In this case, the first syllable cannot hold a long vowel, as is seen in (44).[44]

(44)



The result would be that the length difference between the minimal pairs would disappear. This prediction proves to be true, based on a preliminary analysis of a small set of minimal pairs.[45] The table in (45) gives the duration of four word pairs differing only in length.[46] Each pair was produced twice by a native speaker of the Chonnam dialect.

(45) Phonetic measurement of duration of words in CGV(:)C + CV(CV)

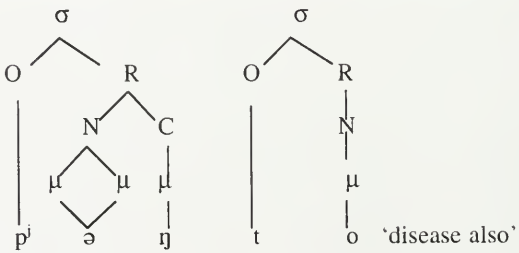
WORD + SUFFIX	REPETITION 1	REPETITION 2	AVERAGE
pjə:ŋ + to 'disease also'	360ms	300ms	330ms
pjəŋ + to 'bottle also'	300ms	280ms	290ms
pjə:ŋ + k'atçi 'disease even'	500ms	400ms	450ms
pjəŋ + k'atçi 'bottle to'	480ms	480ms	480ms
mjə:n + to 'side also'	540ms	700ms	620ms
mjən + to 'noodle also'	500ms	740ms	620ms
mjə:n + k'a tçi 'side also'	500ms	460ms	480ms
mjən + k'a tçi 'cotton also'	500ms	460ms	480ms

As predicted, we cannot find any systematic difference in duration between the words with a short vowel and those with a long vowel.

The branching model cannot accommodate this result. The representations assumed under the branching nucleus would be as in (46).

(46) a.

b.



According to the structures in (48), the length difference should be maintained after suffixation because the nucleus node can be branched and thus can house the long vowel, regardless of whether the following suffix begins with a vowel or a consonant. Thus, the duration measure, although based on a relatively few tokens from a single speaker, provides the positive evidence for the argument that only one segment can come before and after the syllable peak (= vowel).

Second, one might ask whether this analysis would posit additional consonants in the phonemic inventory of Korean. If it did, there would be no substantial gain in adopting a simpler syllable structure because, as a trade off, a simpler structure would inevitably increase the number of phonemes. However, this is not the case. We postulate the same number of phonemes, i.e., C's, w, and j. C^w and C^j are not distinct phonemes. In the phonemic inventory there are only simple consonants and glides independently. The features, which compose these independent phonemes, are combined to make a complex segment when a consonant is followed by a glide, because in the present analysis we permit only one position for an onset. As Duanmu (p.c.) points out, there may be an intermediate level, between the phonemic and phonetic levels, the so-called syllabic level. In that level a glide and the preceding consonant are merged. This merged sound is realized as one sound at the phonetic level. This process is illustrated in (47).

(47)

Phonemic level :	C,	G,	V		
Syllabic level :	O		N	(C)	
	C G		V	(C)	
Phonetic level :	C^G	V	C		

Take *kwaŋ* 'barn' as an example. At the phonological level, we have *k, w, a,* and *ŋ*. At the syllable level, the most sonorous element, *a*, takes the nucleus position. It is important to remember that we have only three slots in the syllable. *k* and *ŋ* take the onset and the coda position, respectively. The problem is to assign a slot to a glide, *w*, which cannot be linked to the nucleus because these two sounds have contradictory and incompatible features: *a* is [+low] and [-high] but *w* is [-low] and [+high]. The only possible position for *w* is the onset[48]. *w* can be connected to *k* because the combination of these two sounds do not disobey any feature-geometric principles: *w* has a Labial articulation and *k* has a Dorsal articulation. The less sonorous element, *k*, is the main part of the onset and the more sonorous is added as a secondary articulation to it.

6. Implications

The above analysis assumes a simpler syllable structure for Korean than do the NH and the COH. The simple structure is preferred as long as it has at least the same power of explanation as the more complicated structure. As has been argued here, the simple structure provides an even more efficient way to account for phenomena involving glides in Korean.

The simple syllable structure with one position per constituent of a syllable accounts for the new facts as well as the previously known facts. This is summarized in (48).

(48) Comparison of explanatory power

	NH	COH	SOH
Co-occurrence	No	Yes (in part)	Yes (explains why)
Consonant cluster reduction	Yes	Yes (as exception)	Yes (naturally)
Ideophones with *j* and liquids	Yes	Yes	Yes
Ideophones with *w* and other Cs	Yes	No	Yes
Language Game	Yes (for half the data)	Yes (for half the data)	Yes (for all the data)
L/r alternation	Yes	Yes	Yes
No cons. cluster	Yes	No	Yes
Vowel harmony	No	Yes	Yes (more naturally)
Glide formation	No	Yes	Yes
Length neutralization	No	Yes	Yes

This paper has shown that a simpler syllable structure can explain a new set of the Korean data not dealt with previously and provides a better explanation for the facts already studied than do the NH and the COH.

NOTES

[1] This is the view suggested by Paul Newman at the 3rd Mid-Continental Workshop on Phonology, Indiana University, 1997.

[2] Steriade (1988:121) points out that'co-occurrence constraints based on sonority distance are found exclusively within the pre- or post-nuclear section and never between the nucleus and the pre-nucleus section.'

[3] This excludes the idea that a glide selects the element on its right side rather than on its left side in the flat structure.

[4] *tç* is an affricate rather than two consonants, usually transcribed as *c*. In this paper, the IPA symbol is used.

[5] Lee 1993 analyzes the reduplication data based on the assumption that the second part of the ideophones is the base for the reduplication. For more detail, see Lee 1993.

[6] I use the diacritic ' to indicate tenseness rather than an ejective.

[7] Some native speakers of Korean disagree with the base form of these words. They think these words are formed through full reduplication of the base form with no onset consonant. For them, the word for 'tasty' is *jam-jam*, not *jam-njam*.

[8] According to Lee 1993, (9) is not a correct form. I will return to this point.

[9] In Korean only 7 consonants, [p], [t], [k], [m], [n], [l], and [ŋ], can occur in the coda position, where every fricative is realized as a stop and every obstruent loses its fortis or aspirated character.

[10] The consonant cluster in the onset does not exist any longer in Modern Korean.

[11] The change from *st* to [t'] is due to Tensification.

[12] Here the COH assumes an onset consonant and a glide are in the onset as a consonant cluster, not as one complex segment.

[13] [RTR] is dominated by the Radical articulator under the Pharyngeal cavity according to Halle 1992.

[14] Lee 1993 contends that *sj* is not possible, but I do not agree. For details, see (22).

[15] Lee 1993 postulates the phonotactic constraints such as *[+high, -round] [+high, -round] for **ji* and **ji* and *[+round][+round] for **wu* and **wo*. The second constraint does not work due to **wi* .

[16] Lee 1993 cites Ohala & Kawasaki 1984, who claim that combinations of similar sounds do not make a sufficient distinction. Thus, the combinations are rare. This also accounts for the nonoccurrence of *uu* and *ii* in Korean.

[17] In *kaps-to*, *st* is not permissible in the Korean syllable template. Thus, this consonant cluster must be simplified.

[18] Lee 1993 does not assign any mora for the coda consonant.

[19] By a nasal sound, Lee 1993 seems to mean an alveolar nasal sound, because Korean has a labial nasal in word-initial position followed by a front glide or front vowel as in the name *Mirjəng*.

[20] Ahn 1986 and Lee 1982 assume two segments in the onset.

[21] As mentioned in §2.2, some of these restrictions are pointed out by Lee 1993.

[22] Some Korean phonologists claim there is one more vowel, *ø*. However, this sound is now not distinctive from *we* and *wɛ* and is no longer a monophthong in the Seoul dialect.

[23] Compare this with Lee's observation in § 2.2.

[24] *je* and *jɛ* do not occur after a consonant in the onset.

[25] *we* and *wɛ* do not occur after a consonant in the onset.

[26] Compare this with Lee's observation in 2.2.

[27] Here I refer to the phonological level. Orthographically *tçjV, tçʰjV, tç'jV,* and *s'jV* are possible but not at the phonological level. For example, the first letter of the Korean version of the English loanword *chocolate* is *tçʰjo* orthographically, but is pronounced /tçʰo/.

[28] Exceptionally, *s* can precede jV. I found that the pronunciation of *s* + jV is exactly the same as a palatal sound [çʰ] +V. This sheds some light on the apparent exception, implying that *s* and *j* form one palatal sound. For more details, see Duanmu [forthcoming]. *s'jo* is possible exceptionally only for the English loanword *show*.

[29] *mwə* 'what', *pwə* 'pour + IMP', and *pwa* 'see + IMP' are permitted in the orthography. It is noteworthy that these combinations are all a result of glide formation from the underlying forms of *mu* +*ə* , *pu* + *ə,* and *po* + *a,* respectively. According to the author's native-speaker intuition, these combinations are pronounced without a glide at the phonetic level, turning them into *mə-, pə,* and *pa.*

[30] The name of a poem.

[31] The name of a poem.

[32] The name of a poem.

[33] When this consonant cluster is followed by a vowel-initial morpheme, then one of the consonants is resyllabified as the onset of the following syllable. When the consonant cluster is followed by a consonant-initial morpheme, then one of the consonants is deleted. As a result, there appears to be no syllable with a consonant cluster at the surface level.

[34] See § 2.2.

[35] See (19).

[36] The NH uses *jam-njam* to argue that the reason [j] remains in the reduplicated part is that [j] is not in the onset.

[37] Beddor (p.c.) points out that there are languages which allow lip-rounding gesture as a secondary articulation even when the primary articulation is made at the lip. For examples of these languages, see Ladefoged & Maddieson 1996. Current feature-geometry theory does not provide a plausible explanation for the existence of these sounds, which involve the same articulator both for a primary articulation and for a secondary articulation. However, as we can see in Ladefoged

& Maddieson's report that labialization as a secondary articulation is especially common with velar or uvular consonants and that many languages permit labialization only of back consonants, languages prefer the sounds produced by a different articulator for a secondary articulation from a primary articulation. For example, labialization with other consonants than labial consonants is preferred. At least for the languages that show this preference, the current feature-geometry theory provides a good explanation.

[38] See fn. 27.

[39] See fn. 28.

[40] See fn. 29.

[41] What happens to the onset when it consists of a glide, not a complex segment with a glide in it? The ending suffix -*jo* gets the form *jo-pjo* or *jo-po* in the language game. *Yo-po* is produced by deleting the whole onset segment. For *jo-pjo*, Duanmu (p.c.) informs me that there is a proposal, which needs so-called feature recycling. When a segment is deleted, some features of the segment that are compatible with the features in the following segment survive in the following segment. For example, when [kj] is deleted before [p], features of [j] move into [p] because the resulting sound [p^{j}] is a possible sound. However, the feature of [k] cannot survive on [p] because [p^{k}] is not a possible segment.

Turning to the language game again, when the onset is deleted, the coronal feature survives on the new onset consonant. This is possible because [pj] is an admitted segment in Korean. That is, we can say that in one version of the language game, (25), features are recycled. Or we can say that in both versions of language games, (25) and (26), features are recycled, but in (26), a secondary articulator is not allowed in the output.

[42] This is due to a kind of dissimilation.

[43] This is due to a kind of dissimilation. Neither the sequence of wVp nor wVm is permitted in Korean. Although *k^{w}am* is permitted, we may accommodate this exception by suggesting that only the features of primary articulators are subject to dissimilation. I am indebted to C-W. Kim for this observation.

[44] In my analysis, vowel shortening follows from syllable structure. Consider *pjəː.ŋ*, *pjəː.ŋi*, and *pjəŋ.to*. Vowel shortening occurs only in the third case because the coda consonant cannot find room in the following syllable. If the vowel shortening were due to a loss of the vowel length distinction in modern Korean, it would be difficult to see how vowel shortening is accounted for in a simple manner without referring to syllable structure. For example, *pjəː . ŋi*, and *pjəŋ . to* have two syllables, but vowel shortening occurs only in the second case.

[45] The experiment is indeed a very small-scale pilot study, and a large-scale investigation would be helpful.

[46] Measurements were taken of the whole word not just of the first syllable or the vowel.

[47] Whether it is *pʲ* or *pj* and whether it is in the onset or in the nucleus, the issue is not relevant here, because usually the element in the onset is not considered to be a mora, and a glide bears no mora according to the NH, either. Therefore, with regard to the length difference, it does not matter whether the onset has one segment or two, or a glide is in the onset or in the nucleus.

[48] *wa* is bad only when we analyze it as one sound in the nucleus, because *w* and *a* have contradictory features. Thus, the presence of *aj*, *aw*, and other falling diphthongs is not a problem. According to the standard analysis, *aj*, *aw*, etc., are not one sound, but two, and are equal to a long vowel. Each of their components has a separate set of features, and in each feature set, there is no conflict of features.

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ENGLISH *TOUGH* SENTENCE ANALYSIS OF JAPANESE 'INTRANSITIVIZED' VERBAL GERUND + *AR* ('BE') SENTENCES[1]

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The current paper proposes an analysis similar to Chomsky's (1981:308) analysis of the English *tough* sentence for analyzing intransitivized verbal gerund + *ar* ('be') sentences in Japanese. It will be shown that Matsumoto's 1990 Argument Sharing Analysis is not adequate enough to explain the fact that it is impossible to *wh*-extract an adverbial adjunct to the verbal gerund over the matrix verb *ar* ('be') for forming a relative clause. The proposed analysis, together with i) ECP in Lasnik & Saito 1992 and Chomsky 1986, and ii) an Empty Operator Analysis of Japanese relative clauses, explains the *wh*-extraction phenomenon. The proposed analysis predicts an unbounded dependency phenomenon, as in the English counterpart *John is easy to forget to ... forget to please* with an unbounded recursion of *forget to*.

0. Introduction

Japanese has 'intransitivized' verbal gerund + *ar* ('be') sentences, as in (1), where *yob ite* phonetically realizes as *yonde*.

(1) danseekyaku ga paatii ni yob ite ar u.
male guest-NOM party-to invite-GER be-NONPERF
'Male guests have been invited to the party.'
Lit., 'Male guests$_k$ are in the state of someone having invited them$_k$ to the party.'

The verb *yob* ('invite') in (1) is a transitive verb, which subcategorizes for an accusative-marked NP, as shown in (2).

(2) mearii ga danseekyaku o paatii ni yob u.
Mary-NOM male guest-ACC party-to invite-NONPERF
'Mary invites male guests to the party.'

On the other hand, if the transitive verb *yob* ('invite') combines with *-ite* (GERUND-MARKER) + *ar* ('be'), then the NP-*o* of the verb *yob* ('invite') is NOT expressed, as in sentence (1). The ungrammaticality of example (3) with the intended meaning that male guests have been invited to the party shows that THE NP-*O* OF THE *ITE*-MARKED V IN THE 'INTRANSITIVIZED' *-ITE AR* SENTENCE, here *yob* ('invite'), as in (1), MUST NOT BE EXPRESSED IN THE SENTENCE.

(3) *danseekyaku$_k$ ga karera$_k$ o paatii ni yob ite ar u.
male guest-NOM they-ACC party-to invite-GER be-NONPERF

Example (3) also shows that there is no *pro* of NP-*o* in (1).[2] [3] Note that THE NOMINATIVE-MARKED NP IN THE 'INTRANSITIVIZED' VERBAL GERUND + *AR* ('BE') SENTENCE, e.g., *DANSEEKYAKU* ('MALE GUEST'), IS UNDERSTOOD AS COREFERENTIAL WITH THE UNEXPRESSED NP-*O* OF THE *ITE*-MARKED V, *YOB* ('INVITE') IN (1), IN TERMS OF INTERPRETATION.

1. Argument sharing analysis by Matsumoto 1990

1.1 The argument structure of the *ar* ('be')

Matsumoto 1990 proposes that THE VERB *AR* OF THE 'INTRANSITIVIZED' *-ITE AR* SENTENCE HAS TWO ARGUMENTS, **THEME** AND **STATE**, as represented in (4).

(4) *ar* ('be') <THEME, STATE>

Ite (GER)-marked VP realizes the STATE argument of *ar* ('be'). For example, VP *paatii ni yob* ('party to invite') realizes the STATE argument in (1). The *ga*-marked NP realizes the THEME argument; e.g., in (1), *danseekyaku* ('male guest') realizes the THEME argument. As entailed by Matsumoto's 1990 analysis, it will be argued later that the *ite* (GER)-marked VP is not an adjunct.

1.2. Argument sharing between the *Ite* (GER)-marked V and the *ar* ('be')

Then, Matsumoto 1990 proposes:
1) the *ite*-marked V has an argument structure that contains a PATIENT argument,
2) the THEME argument of matrix V *ar* ('be') is shared with the PATIENT argument of the *ite*-marked V, and
3) the association of 'subjecthood' in a sentence as a whole to an argument of the secondary predicate (e.g., *yob* ('invite') in sentence (1)) is prohibited in the presence of an argument of a primary predicate (e.g., *ar* ('be') in (1)) that is associated with 'subject.'[4]

Thus, for example, the argument structures of *ar* ('be') and *yob* ('invite') in example (1) can be represented in (5).

(5) *aru* <THEME, STATE>
yob <(AGENT), LOCATIVE, (PATIENT)>

The AGENT argument of the *ite*-marked V is implicit, by the clause for the association of subjecthood. The THEME argument of *ar* ('be') and the PATIENT argument of the *ite*-marked V are associated. If my understanding is correct, Matsumoto 1990 assumes that since the THEME argument of matrix V *ar* ('be') is shared with the PATIENT argument of the *ite*-marked V, the *ga*-marked NP realizes both of the THEME and PATIENT arguments. Thus, no NP-*o* is expressed to realize the PATIENT argument. This explains, e.g., the fact in example (1) that the *ga*-marked NP *danseekyaku* is understood as coreferential with the UNexpressed NP-*o* of verb *yob* ('invite'), in terms of interpretation, and that the NP-*o* must not be expressed.

2. Problems and an argument for Matsumoto 1990

2.1 An argument for the *Ite*-marked phrase as a complement

It will be argued in this section in favor that the *ite*-marked phrase of the *-ite ar* sentence in question is NOT an adjunct, but a complement.[5]

Native speakers find that sentence (6) does not entail sentence (7), while sentence (8) entails sentence (9).

(6) sake ga nomihos ite ar u.[6]
rice wine-NOM drink up-GER be-NONPERF
'The rice wine has been drunk up.'

(7) sake ga ar u.
rice wine-NOM be-NONPERF
'There is rice wine.'

If the rice wine has been drunk up, the rice wine is no more there. Thus, sentence (6) does not entail sentence (7).

(8) sake ga atatamerar ete tukue no ue ni
rice wine-NOM be made hot-GER desk-GEN-top-LOC-
ar u
be- NONPERF
'The rice wine is on the desk, having been made hot.'

(9) sake ga tukue no ue ni ar u.
rice wine-NOM desk-GEN-top-LOC be-NONPERF
'There is rice wine on the desk.'

If there is rice wine on the desk, having been made hot, then it is necessarily the case that there is rice wine on the desk. Thus, sentence (8) entails sentence (9).

Suppose that the *ite*-marked phrase OF THE 'INTRANSITIVIZED' *-ITE AR* SENTENCE, as in example (6) and example (1), is not an adjunct, but a complement. Suppose further that such an *ite*-marked phrase as in example (8) is analyzed as an adjunct.[7] (Sentence (8) does not have the properties of the 'intransitivized' *-ite ar* sentence that were given in the introduction of this paper). These two assumptions explain the contrast between the non-entailment from (6) to (7) and the entailment from (8) to (9) in the following way.[8] Since the *ite*-marked phrase in example (6) and example (1) is a complement, sentence (6) does not entail sentence (7), which does not have the *ite*-marked phrase.[9] Every constituent of NP-*ga*, *ite*-marked VP, and *ar* ('be') in sentence (6) and sentence (1) is a necessary part for the sentence to describe an event. Since the *ite*-marked phrase in (8) is an adjunct to matrix verb phrase *tsukue no ue ni ar* ('be on the desk'), sentence (8) entails sentence (9), which does not have the *ite*-marked phrase. The *ite*-marked VP in (8) describes an event which the event described by the sentence without the *ite*-marked VP co-occurs with. Thus, the contrast between those entailments supports that the *ite*-marked phrase in the 'intransitivized' *ite ar* sentence is a complement, i.e., is not an adjunct. In other words, the content of the *ite*-marked

phrase in the 'intransitivized' *ite ar* sentence is an argument, as entailed by Matsumoto's 1990 analysis.

2.2. Problems for Matsumoto's 1990 analysis

There are phenomena that Matsumoto's 1990 Argument Sharing Analysis cannot make correct predictions of. For example, in a noun phrase, a head noun with a relative clause cannot be understood as an adverbial adjunct to the *ite*-marked VP in the 'intransitivized' *-ite ar* sentence.[10] Noun phrase (10), where *kaw ite* phonetically realizes as *katte* and *ar ita* phonetically realizes as *atta*, which has a relative clause adjoined, cannot be understood as meaning (11).

(10) [$_{RC}$ pan ga kaw ite ar ita] panya$_i$ (a noun phrase)
bread-NOM buy-GER be-PERF bakery

(11) *[$_{RC}$ pan ga [$_{VP}$ t_i [$_{VP}$ kaw]] ite ar ita] panya$_i$[11]
bread-NOM buy-GER be-PERF bakery
Lit., (Intended Meaning) 'the bakery$_i$ where someone bought bread at the store$_i$ and he or she keeps the bread ,e.g., at home, for a future use.

Rather, the head noun is understood as an adverbial adjunct to the MATRIX VP that contains *ar*, as shown by (12).

(12) [$_{RC}$ pan ga [$_{VP}$ t_i [$_{VP}$ kaw ite ar]] ita] panya$_i$
bread-NOM buy-GER be-PERF bakery
'the bakery$_i$ where bread was at there$_i$ after it had been bought at some other store'

Nothing in Matsumoto 1990 prevents the noun phrase (10) from being understood as (11). According to Matsumoto 1990, the argument structure of the relative clause in (10) is represented as below.

(13) *ar* <THEME, STATE>
kaw <(AGENT), (PATIENT)>

As Matsumoto 1990 argues, an adverbial adjunct can adjoin to the *ite*-marked phrase in the sentence, which realizes the STATE argument of the *ar* ('be'), as in (14).

(14) pan ga sono panya de kaw ite ar ita.
bread-NOM that bakery-LOC buy-GER be-PERF
'Bread had been bought at that bakery, and was, e.g., AT THE SPEAKER'S HOUSE.'

The adverbial adjunct *sono panya de* ('at that bakery') does not adjoin to the matrix verb *ar* ('be'), but adjoins to the *ite*-marked VP, as given in (14). The location where the bread was at last is the speaker's house, which may be different from that bakery.

Then, the head noun in the noun phrase (10) should be able to be understood as meaning that it is adjoined to the *ite*-marked phrase in the

'intransitivized' *-ite ar* sentence, as in other sentences containing a complex predicate. For example, noun phrase (15), where *kaw ite* phonetically realizes as *katte* and *moraw ita* phonetically realizes as *moratta*, contains V-*ite moraw* ('receive') in place of the V-*ite ar* ('be').

(15) [$_{RC}$ zyon ga mama ni pan o kaw ite moraw ita]
John-NOM mom-DAT bread-ACC buy-GER receive-PERF
panya
bakery
'the bakery where John received from his mother the favor of buying bread

In (15), the head noun *panya* ('bakery') is understood as the adjunct to the *ite*-marked phrase, as represented in (16).

(16) [$_{RC}$ zyon ga mama ni [$_{VP}$ t_i [$_{VP}$ pan o kaw]] ite moraw ita] panya$_i$

It is also the case that the PP adjunct is adjoined to the *ite*-marked V in the base-generated position, as shown in (17), where *kaw ite* phonetically realizes as *katte* and *moraw ita* as *moratta* as in the previous example.

(17) zyon ga mama ni sono panya de pan o kaw ite moraw ita.
that-bakery-LOC
'John received from his mother the favor of buying bread at that bakery.'

The contrast between the ungrammaticality of (11) and the grammaticality of (16) shows that the 'intransitivizing' *-ite ar* ('be') sentence is different from the typical complex predicate sentences in Japanese, e.g., the V-*ite moraw* ('V-GER receive') sentence as in (15). Matsumoto's 1990 Argument Sharing Analysis is thus not adequate to explain the ungrammaticality of (11).

2.3 A clarification of example (11) with an analysis of Japanese relative clauses

An analysis of relative clauses clarifies the contrast between example (11) and example (16). Noun phrase (18) in English contains a relative clause counterpart of sentence (19).

(18) the man (whom) John invited (a noun phrase)

(19) John invited the man.

The noun with such a relative clause as (18) is analyzed as in (20) in English (Chomsky 1993:529).

(20) the man$_i$ [$_{CP}$ {whom, *Op*}$_i$ [$_{IP}$ John invited t_i]]

Whom or an empty operator *Op* moves to the [Spec, CP] from the base-generated position, in this case, from the object position of V *invite*. The operator at the head of the CP triggers the movement of the empty operator, by the SPEC-head relationship. The N', in this case, *man*, obligatorily controls the *wh*-phrase or the empty operator at the [Spec, CP].

I assume that Japanese relative clause is analyzed the same way as in English. Noun phrase (21) contains a relative-clause counterpart of sentence (22).

(21) zyon ga yob u otoko (a noun phrase)
John-NOM invite-NONPERF man
'the man John invites'

(22) zyon ga otoko o yob u.
John-NOM man-ACC invite-NONPERF
'John invites a man.'

Since Japanese is a head-final language, the head noun is final in the noun phrase, as shown in (21). Noun phrase (21) is analyzed as in (23).

(23) $[_{CP}\ Op_i\ [_{IP}$ zyon ga t_i*(-o)* yob u]] otoko$_i$

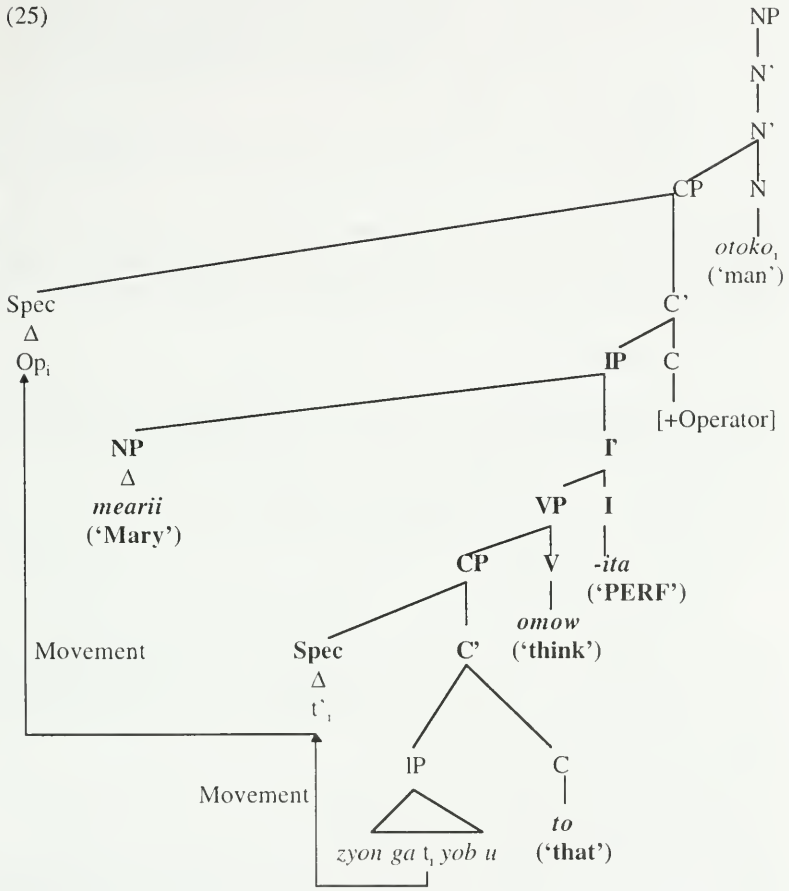
The empty operator moves to [Spec, CP] from the base-generated position, in this case from the object position, triggered by [+ Operator] as C. The head noun obligatorily controls the empty operator, as coindexed.

The Empty-Operator-Movement analysis of a relative clause is independently motivated, for example, to explain the unbounded dependency between a head N' and a relative clause in Japanese. For example, a noun phrase (24), where *omow ita* phonetically realizes as *omotta*, is analyzed as in (25).

(24) zyon ga yob u to mearii ga omow ita
John-NOM invite-NONPERF-COMP Mary-NOM think-PERF
otoko (a noun phrase)
man
'the man Mary thought John would invite.'

It is assumed that [Spec, CP] with the head *to* ('that') is available for an empty operator or *wh*-phrase to move through (Chomksy 1986; Lasnik & Saito 1992). Then, the empty operator, base-generated at the object position of verb *yob* ('invite'), moves through the [Spec, CP] of the head *to* ('that') to the [Spec, CP] of the head [+ Operator] (for a relative clause formation). (As will be discussed later, the ECP (Empty Category Principle) for the trace is satisfied because the trace is theta-governed by verb *yob* ('invite'). The trace is also antecedent-governed, as will be seen later.) It is possible to multiply the boldfaced configuration in the tree diagram arbitrarily, with a [Spec, CP] for each configuration of NP-*ga to omow* ('NP-NOM COMP-think') and the same number of [Spec, CP]s. All the [Spec, CP]s are occupied by the intermediate traces, which are antecedent-governed. Thus, the unboundedness phenomenon is explained.

(25)



The analysis of relative clauses as above may clarify the contrast between example (11) and example (16), to some extent, in the following way. In (11) (= (26)), the matrix verb is the *ar* ('be'). As discussed, there must be no implicit accusative NP in the *te arita* clause in (26), and the sentence is understood as if the nominative NP is co-referential with the unexpressed NP-*o*, as coindexed with *k*.

(26) *[$_{CP}$ *Op*$_i$ [pan$_k$ ga [$_{VP}$ *t*$_i$ [$_{VP}$ #$_k$ kaw]] ite **ar** ita]] panya$_i$

bread-NOM *buy-GER* *be-PER* *bakery*

The relationship between the relative clause operator Op$_i$ and the adjunct trace t_i is intervened by the co-index relationship between the nominative NP and the unexpressed accusative NP. On the other hand, in (16) (= (27)), the matrix verb is the *moraw* ('receive'), by which the NP-*o* ***pan o*** (or maybe as a *pro* of NP-*o*) is expressed in the clausal complement.

(27) [$_{CP}$ Op_i [zyon ga mama ni [$_{VP}$ t_i [$_{VP}$ **pan o** kaw]] ite

John-NOM mom-DAT bread-ACC buy-GER

moraw ita]] panya$_i$

receive-PERF bakery

'the bakery where John received from his mother the favor of buying bread'

The relationship between the relative clause operator Op_i and the adjunct trace t_i is intervened by no co-index relationship such as in (26). The details, i.e., the prediction of the proposal together with this analysis of relative clauses, will be given in the next section.

3. A proposal

My proposal is that the Japanese 'intransitivized' verbal gerund + *ar* ('be') sentence is analyzed as similar to that of the *tough* construction in English by the first suggestion in Chomsky (1981:308).[12]

Chomsky (1981:308) analyzes the complex-adjectival sentence (or the *tough* sentence), such as sentence (28), as in (29).

(28) John is easy to please.

(29) John$_k$ is easy [$_{CP}$ Op_k [$_{IP}$ PRO_{arb} to [$_{VP}$ please t_k]]]

The empty operator moves from the object position of the embedded V to the [Spec, CP] in the clausal complement.[13] The matrix subject obligatorily controls the empty operator, as coindexed. The adjective *easy* subcategorizes for a CP complement with the following properties:

a) The head of CP is the null [+ Operator],

b) The head of INFL in the CP is infinitive, i.e., *to*,

c) An empty operator is at [NP, V'] of the CP, and

d) PRO_{arb} is located at the [NP, IP] of the CP.

(It is not clear how Chomsky (1981; 1993:21) treats the subject, and the copula in (29).)

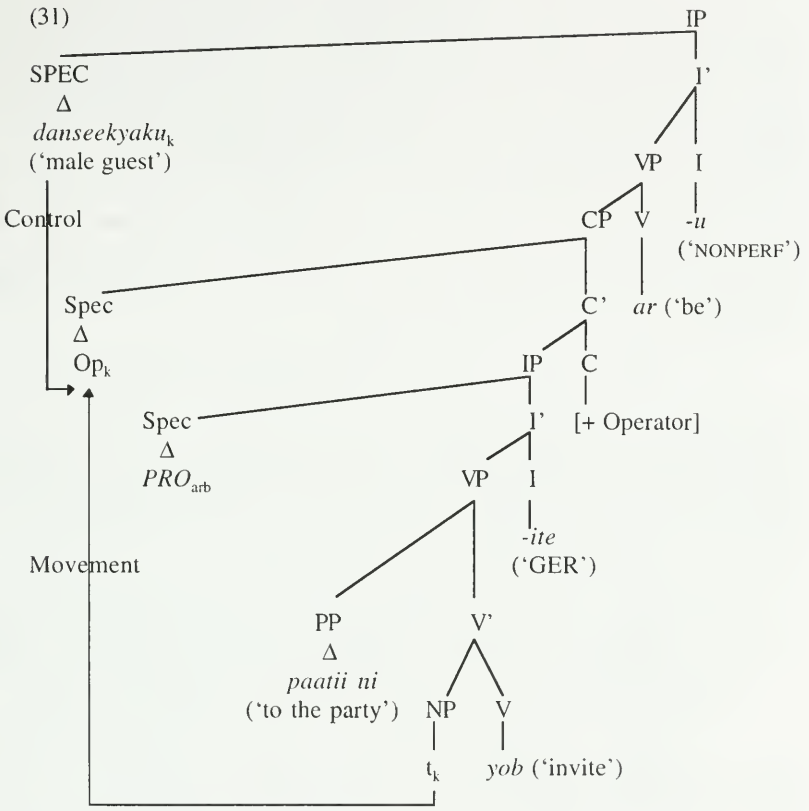
I propose that the 'intransitivized' *-ite ar* sentence (1), repeated here as (30), is analyzed as in tree diagram (31), similar to Chomsky's 1981 *tough* analysis.

An empty operator is base-generated at the object position (i.e., [NP, V']) of the *ite*-marked verb, in this case, *yob* ('invite'),[14] leaving a trace co-indexed, and then moves to the embedded [Spec, CP] position.[15] The NP at the matrix [Spec, IP] obligatorily controls the empty operator at the embedded [Spec, CP]. NP *dan-sei-kyaku* ('male guests) is base-generated at [Spec, IP], and the NP-*ga* is a complement of the *ar* ('be').[16] In other words, the *ar* ('be') subcategorizes for NP, and CP with the following properties:

(30) danseekyaku ga paatii ni yob ite ar u.

male guest-NOM party-to invite-GER be-NONPERF

'Male guests have been invited to the party.'



a) The head of the CP of the CP complement is the null [+ Operator],
b) The head of INFL in the CP complement is infinitive, i.e., *-ite* (GERUND MARKER) in Japanese,
c) An empty operator is base-generated at [NP, V'] of the CP complement, and
d) PRO_{arb} is located at the [NP, IP] of the CP complement.

Property c) presupposes that the *ite*-marked V is a transitive verb. Clause c) will be revised in the next section, as a new fact is provided. I_0 is *-ite*, which makes the preceding V a gerund.[17] PRO_{arb} at the [NP, IP] of the embedded clause is interpreted as *someone*, as in Inoue (1976).

4. Predictions

For example, the proposed analysis makes several predictions, as follows.

4.1 Of the contrast between examples (11) (= (26)) and (16) (= (27))

I will examine how the proposed analysis together with the empty category principle (ECP) explains the contrast between example (11) (= (26)) and example (16) (= (27)).

An explanation of the ECP (Empty Category Principle) in Lasnik and Saito 1992 and Chomsky 1986[18] is in order before the examination. A trace, i.e., an invisible syntactic form in a governed position with its semantic correlate existent, e.g., the trace t_i in *Who*$_i$ [*does John love* t_i]?, *John*$_i$ *seems* [t_i *to go*], must EITHER (i) be in a certain position OR (ii) have a relationship with some other co-indexed form in a certain position, as below from Chomsky (1986:88).

(32a) 'The ECP[19] requires that trace be PROPERLY governed — that is, not only governed but also antecedent-governed or, perhaps, theta-governed.'

This ensures that an adjunct trace as well as intermediate traces must be antecedent-governed, in addition to being governed.

(32b) 'A head α theta-governs its complements, which it theta-marks; if lexical, α L-marks its complements [and their heads].' [Brackets are mine]

If Infl is assumed to be not lexical, then VP is not L-marked, as in Chomsky 1986. If Infl is assumed to be lexical, then VP is L-marked, since VP is theta-marked as required by the grammaticality of [*fix the car*]$_i$, *I wonder whether he will* t_i.[20] Since all the discussions in this paper do not differ with regard to either of the assumptions, I will assume the latter one, which is simpler.

(32c) 'α governs β if α m-commands β and no barriers for β exclude α.'

(32d) 'Barriers are determined in two ways: (i) on the basis of L-marking, and (ii) by the Minimality Condition.' 'Under (i), an X^{max} γ is a barrier by inheritance or inherently. γ is a barrier by inheritance if the X^{max} it most closely dominates is a blocking category (BC); it is a barrier inherently if it is a BC itself. An X^{max} is a BC [for β] if it is not L-marked [and X^{max} dominates β]. Under (ii), a category γ is a barrier for β if it is **the immediate projection (alternatively, a projection)** of a zero-level category $\delta \neq \beta$. In either case β is not governed by α if α is excluded by a barrier for β. The I-projection system is 'defective' in that I' and IP are barriers only by inheritance (so that, in particular, IP is not a barrier for antecedent government and I' is excluded from the Minimality Condition).' [Bold and bracket are mine]

Note that, as given, VP is not a barrier on the above assumption that is used within this paper. For the bolded part, I use 'a projection' since all the discussions in this paper do not rely on either of these assumptions. I changed the sentence without brackets in Chomsky (1986; 88) to the sentence above, i.e., *An* X^{max} *is a BC [for β] if it is not L-marked [and* X^{max} *dominates β]*, following Chomsky's (1986:14) formulation of his (25).

What follows are two illustrative contrasts that the ECP can make correct predictions of. The contrast between example (33) and example (35) is explained by the ECP in the following way. Example (33) is analyzed as in (34).

(33) How$_i$ did John want to [fix the car t_i]? (Chomsky 1986)

(34) How$_i$ did John want [$_{CP}$ t'_i [to [fix the car t_i]]]?

The initial adjunct trace t_i is antecedent-governed by the intermediate trace t'_i, and so properly governed.[21] The intermediate trace t'_i is antecedent-governed by the *wh*-phrase *how*, and so properly governed. Note that the embedded CP cannot be a barrier for *how* to antecedent-govern THE INTERMEDIATE TRACE since the IP that it immediately dominates is not a blocking category for the intermediate trace. This is because the IP does not dominate the intermediate trace. Note also that the *wh*-phrase does antecedent-govern the intermediate trace, as in *how did you fix the car* in Chomsky (1986:19). This is because the matrix CP is not a barrier for the *wh*-phrase to antecedent-govern the intermediate trace. The matrix CP is not excluded by the *wh*-phrase, by (32d). On the other hand, example (35) violates the ECP. Example (35) is analyzed as in (36).

(35) *How$_i$ did John know which car$_m$ to [[fix t_m] t_i] (Chomsky 1986:11)

(36) *How$_i$ did John know which car$_m$ to [[fix t_m] t_i]

The adjunct trace t_i is not properly governed. It is not theta-governed since it is an adjunct. It is not antecedent-governed, either. In this case, the embedded CP is a barrier for the trace since the CP receives its barrierhood from the IP that it immediately dominates. The IP here is a blocking category since it is not L-marked. If *which car* did not occupy the [Spec, CP] in the embedded clause, then an intermediate trace as t'_i, being there, could antecedent-govern the trace t_i. Actually, *which car* occupies the [Spec, CP] in the embedded clause.[22] Similarly, the contrast between example (37) and example (39) is explained by the ECP in the following way. Example (37) satisfies the ECP. Example (37) is analyzed as (38).

(37) Why$_i$ do you think that John [left t_i]? (Lasnik & Saito 1992:29)

(38) Why$_i$ do you think [$_{CP}$ t'_i that [John [left t_i]]]?

The initial trace is antecedent-governed by the intermediate trace. The intermediate trace is also antecedent-governed by *why*. Example (39) violates the ECP. Example (39) is analyzed as (40).

(39) *How did Bill wonder who wanted to [fix the car t]?

(40) *How$_i$ did Bill wonder [$_{CP}$ who wanted [t'_i to [fix the car t_i]]]]?

The intermediate trace t'_i is not properly governed. It is not theta-governed since it is an adjunct. The intermediate trace t'_i is not antecedent-governed, either. The embedded CP that immediately dominates the IP is a barrier for the *wh*-phrase *how* to antecedent-govern the intermediate trace. If the [Spec, CP] in the embedded clause is not occupied by a *wh*-phrase, *who* in this case, another intermediate trace t''_i, being there, could antecedent-govern the intermediate trace t'_i, with itself antecedent-governed by *how*.

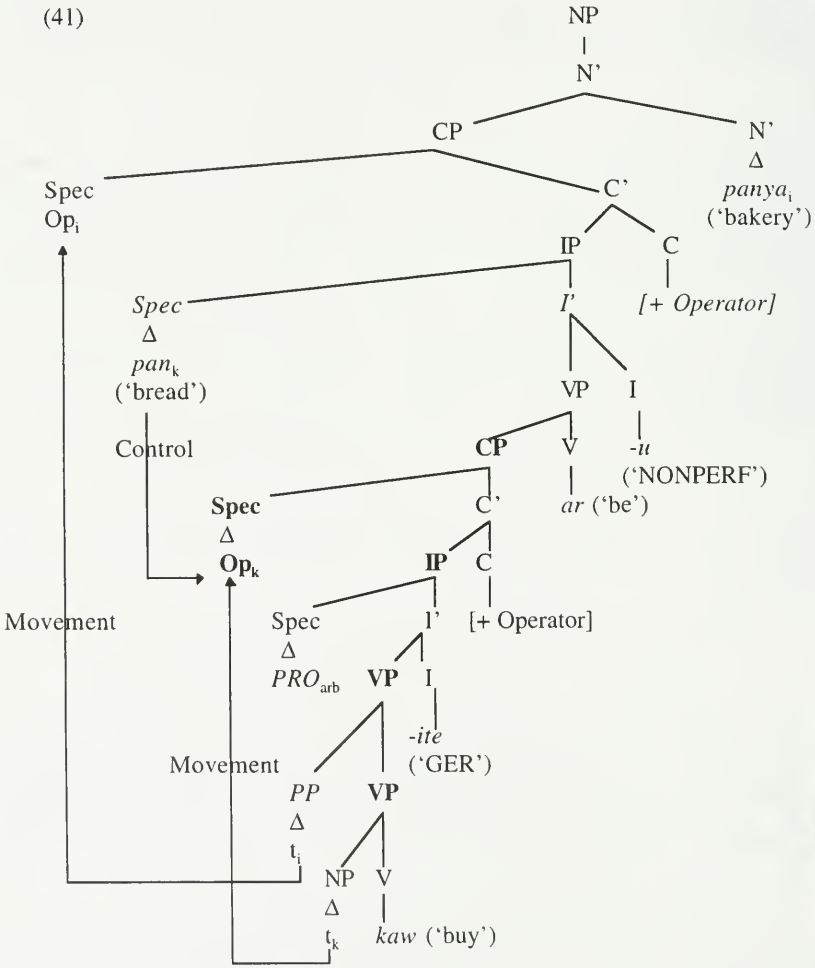
Given the ECP, the contrast between example (11) (= (26)) and example (16) (= (27)) is explained in the following way.

Of Example (11) (= (26)):

Example (11) violates the ECP. The operator of the intransitivized *te aru* sentence within the relative clause prevents the relative clause operator from antecedent-

governing its adjunct trace. See the tree diagram (41). The adjunct trace of the empty operator for the relative clause in the embedded clause, i.e., t_i, does not satisfy the ECP. The adjunct trace is not properly governed. It is not theta-governed since it is an adjunct. It is not antecedent-governed since the embedded CP, which is bold-faced, is a barrier for the operator Op_i to antecedent-govern the trace. The CP obtains the barrierhood from the IP that it immediately dominates. If the [Spec, CP] were not occupied by the operator Op_k, then there would be no violation of the ECP.

(41)

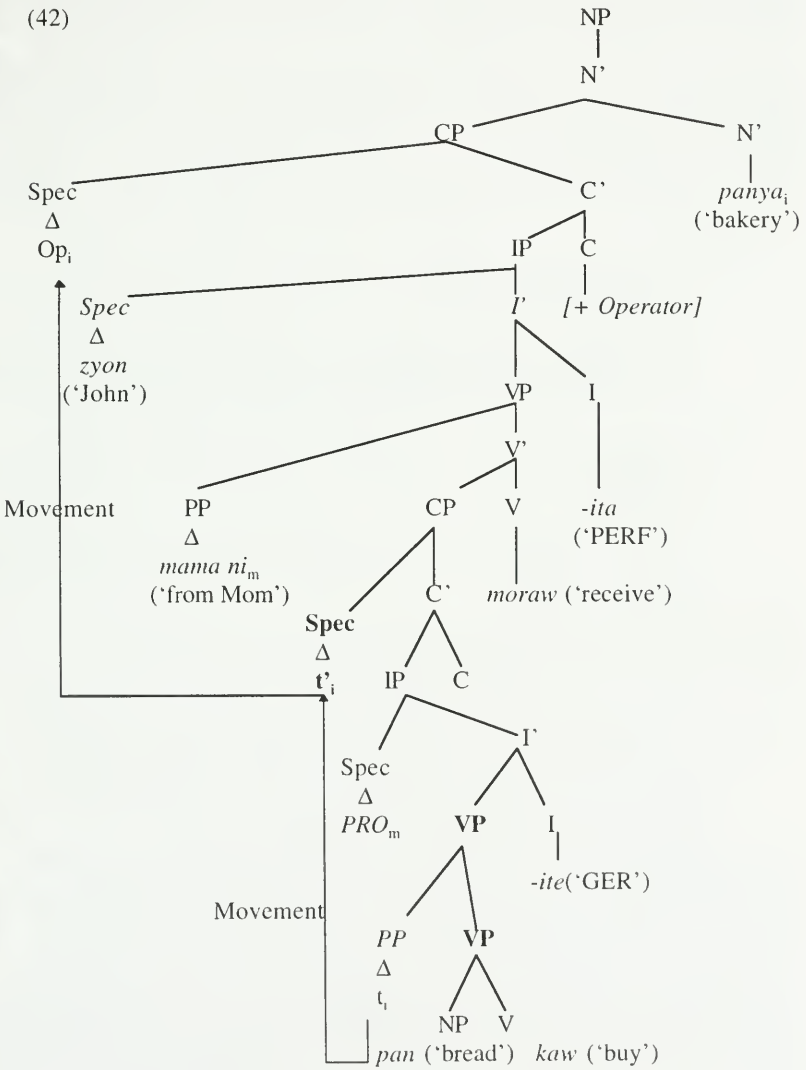


Of Example (16) (= (27)):

I assume that *moraw* ('receive') subcategorizes for PP[*ni* ('DAT')] and infinitive CP, and that PRO is located at the [NP, I'] in the clausal complement, obligatorily

controlled by the PP.[23] The adjunct trace here is properly governed. See the tree diagram (42). There is an intermediate trace t'_i at the embedded [Spec, CP]. The adjunct trace, although it is not theta-governed, is antecedent governed by the intermediate trace t'_i. The intermediate trace is also antecedent-governed by the operator. Thus, the two traces in example (16) satisfy the ECP.[24]

(42)



4.2 An unbounded-dependency phenomenon

Since it uses an empty operator movement, i.e., an instantiation of *wh*-movement for analyzing the 'intransitivized' *ite ar* sentence, the proposed analysis predicts:[25]

The language should have a sentence that permits a new unbounded dependency between the empty operator at the [Spec, CP] the head of which the *ar* ('be') subcategorizes for, and its trace.

This parallels the unbounded dependency, as in *the bakery* WHERE *I think Mary thinks Tom thinks his or her mom bought the bread at*, with NP + *think* iterated. Actually, this is the case. For example, corresponding to sentence (44), where *yob ite* phonetically realizes as *yonde*, Japanese has such a sentence as (43), where *yob ite* phonetically realizes as *yonde* and *moraw ite* phonetically realizes as *moratte*.

(43) danseekyaku ga (mearii ni) paatii ni yob ite .
male guest-NOM (Mary by) party-LOC invite-GER
moraw ite ar u
receive-GER be-NONPERF
Lit., 'There are male guests$_k$ that someone has received, from Mary, the favor of inviting them$_k$ to the party.'

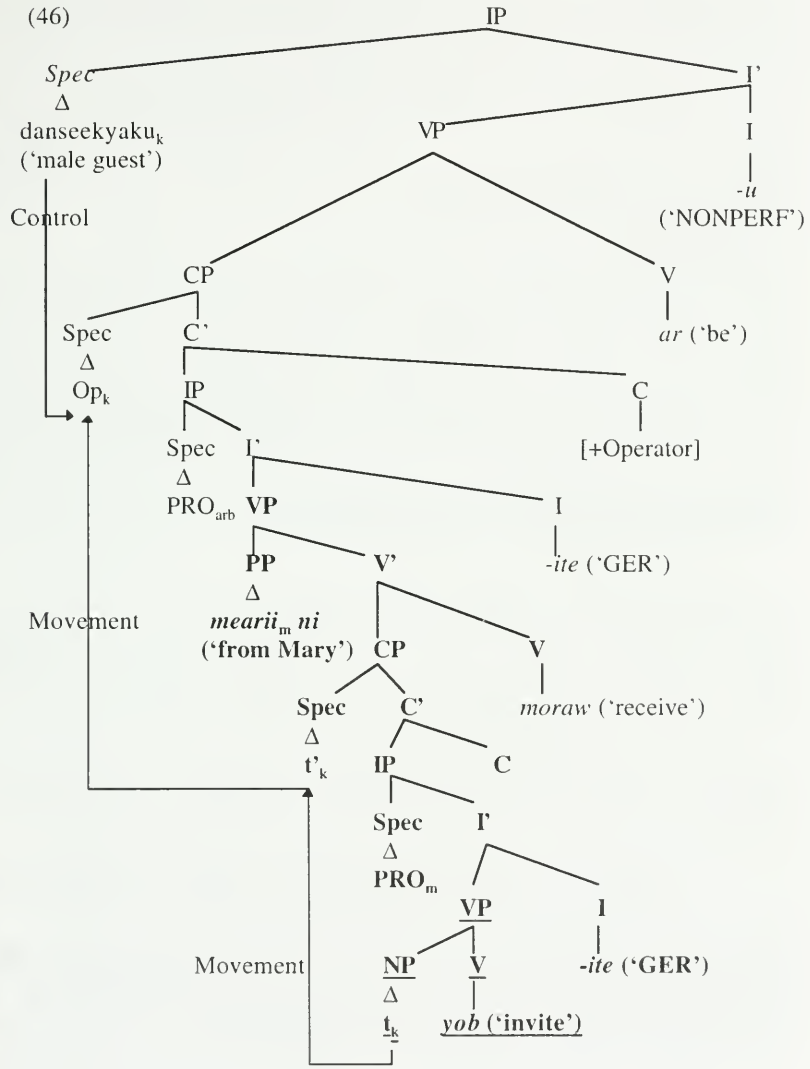
(44) zyon ga (mearii ni) danseekyaku o paatii ni yob ite
John-NOM (Mary by) male guest-ACC party-LOC invite-GER
moraw u.
receive-NONPERF
'John receives the favor of inviting male guests to the party from Mary.'

Here Clause c) in the proposal given in Section 3, i.e., 'An empty operator is base-generated at [NP, V'] of the CP complement,' is replaced with (45).

> (45) Clause c') An empty operator is base-generated at [NP, V'] of the CP complement. If infinitive clause is located at the immediate [NP, V'] of the CP complement, then an empty operator is located at THE [NP, V'] OF THE INFINITIVE CLAUSE. If infinitive clauase is located at the [NP, V'] of the infinitive clause, then an empty operator is located at the [NP, V'] of this infinitive clause. And, so on.

Given this, example (43) is analyzed as follows. See the tree diagram. (46). The *ite*-marked V of the 'intransitivized' *ite ar* sentence is a complex-predicate verb, here *moraw* ('receive') and CP[*infinitive*]. Note that the CP as object here, which is the object of *moraw* ('receive')[26], is not the trace of an empty operator movement. The trace is located at the object position of the verb that is *ite*-marked because of *moraw* ('receive'), i.e., the object position of verb *yob* ('invite'). The subject of the verb *moraw* ('receve') is PRO_{arb}, i.e., is interpreted as *someone*. The initial trace is properly governed since it is theta-governed by the verb *yob* ('invite'). The operator governs the intermediate trace. Thus, the two traces sat-

isfy the ECP. The sentence means that there are male guests$_k$ that someone has received the favor of inviting them$_k$ to the party from Mary.



Then, if another occurrence of the bold-faced configuration is located in place of the BOLDFACED and UNDERLINED configuration, Japanese has such a sentence that it has two occurrences of *mearii ni* ('from Mary') and *moraw* ('receive'), as below.

(47) danseekyaku ga mearii ni MEARII NI PAATII NI YOB ITE MORAW ITE moraw ite ar u.

The intermediate trace t'_k and t''_k are both antecedent-governed in the same way. In the same vein, Japanese possesses such a sentence as below.

(48) danseekyaku ga (mearii ni)^n paatii ni yob ite (moraw ite)^n ar u, *where* (mearii ni)^n, e.g., is the *n*-number of occurrences of *mearii ni*.

The intermediate traces t'_k... $t''\cdots'_k$ are all antecedent-governed in the same way. Here *mearii ni* ('by Mary') and *moraw ite* ('receive GER') can be infinitely recursively iterated in the same number.

5. Implications

There are three implications for syntactic theories in general. First, an analysis of a sentence in a particular language can be similar to an analysis of a sentence in another language THAT HAS A DIFFERENT MEANING. The meaning of English 'Male guests are easy to invite' is different from that of Japanese *danseekyaku ga yob ite ar u* ('Male guest have been invited'). The latter does not contain the Japanese equivalent of English *easy*. However, there is a similarity between their syntactic structures. They both use the empty operator movement. Next, the prediction that the analysis made for Japanese in the last section should be also found for English *tough* sentences as long as the analysis of English *tough* sentences uses an empty operator movement. Actually, this is the case, as shown below.

(49) John is easy to forget to please.

Suppose that the baby called John always looks peaceful to everyone. It is acceptable to utter the sentence in such a context as this. Or, suppose that the baby called John always looks restless. It is also acceptable to utter the sentence in such a context, too. Then, English further allows the following sentence.

(50) John is easy to forget to forget to please.

The sentence sounds odd, and is yet grammatical.[27] Thus, English allows the following sentence, abstracting away from the semantic oddness.

(51) John is easy to {forget to}^{n} please, where {*forget to*}^{n} is the concatenation of the *n*-number of occurrences of *forget to*, i.e., *forget to forget to ... forget to* with *forget to* iterated *n*-times.

Lastly, accordingly, such a revision as clause c') in (45), in place of clause c) of the analysis that I proposed in Section 3, is also needed for the English *tough* sentence analysis if sentence (51) is grammatical in English.

NOTES

[1] I wish to thank Professor Christopher Collins of Cornell University and Professor James Yoon and Professor Peter Lasersohn of the University of Illinois at Urbana-Champaign for helpful comments on various versions of this paper. I also thank Kunio Nishiyama for an informal discussion. Yet, I am responsible for any shortcomings in this paper.

[2] Japanese is a *pro*-drop language, as shown by the contrast between (ia) and (ib). For example, if context can provide who Mary invites to the party, Japanese may allow the implicit pronominal form of NP-*o*, as in (ib), while pro(nominal) *them* must appear in English, i.e., a non *pro*-drop language, as shown by the contrast between (iia) and (iib).

(ia) mearii ga karera o paatii ni yob u.
Mary-NOM they-ACC party-to invite-NONPERF
(ib) mearii ga paatii ni yob u.
Mary-NOM party-to invite-NONPERF
(iia) Mary invites them to the party.
(iib) *Mary invites to the party.

[3] Then, in GB, the implicit element must be a trace since PRO cannot be here because the position is governed by the lexical head *yob* ('invite'). PRO must not be governed in GB.

[4] Matsumoto 1990 proposes this as a general condition that must be satisfied in other complex predicate verbs than the 'intransitivized' *-ite ar* construction in question.

[5] Inoue 1976 and Ono 1984 also agree with this point.

[6] The failure of entailment from (i) to (ii) is another example.

(i) zi ga kesi te ar u
letter-NOM erase-GER be-NONPERF
'Letters have been erased.'
(ii) zi ga ar u
letter-NOM be-NONPERF
'There are letters.'

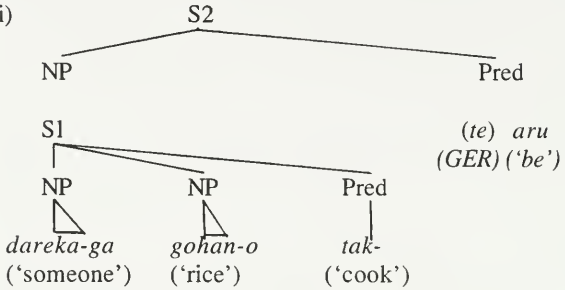
[7] See Shibatani (1978:103) for the same claim concerning the adjunct *ite*-phrase as in sentence (8).

[8] There is another possibility. It may be assumed that the *ite*-phrase in the sentence in question is similar to, e.g., *nearly*, since sentence (i) does not entail sentence (ii).
(i) Mary nearly hit John.
(ii) Mary hit John.

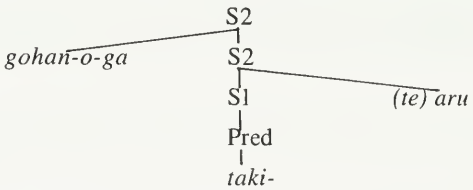
[9] Inoue 1976 proposes that matrix V *ar* ('be') subcategorizes for CP WITH UNSPECIFIED SUBJECT. Tree diagram (ii) is the D-structure of (i).

(i) gohan ga taki te ar u.
rice-NOM boil (i.e., cook)-GER be-NONPERF
'Rice has been cooked.'

(ii)



Only if the unspecified subject, realized by *dareka* ('someone'), is deleted, the object of the embedded V is raised and is adjoined to the matrix S, i.e., S2. The object of the embedded V eventually gets Case-marked with nominative. NP *gohan* ('rice') gets Case-marked with nominative, as shown in
(iii).



Thus, the output *gohan ga taki te ar u* ('Rice has been cooked.') results. I will not discuss Inoue's 1976 analysis on this paper.

[10] Another example is the unbounded dependency phenomenon given in Section 4 in this paper that Matsumoto's 1990 analysis cannot make a correct prediction of.

[11] (i) is another example, where *kaw ite* is realized phonetically as *katte*.
(i) *omocha ga taroo ni $[_{VP} t_i [_{VP}$ kaw]] ite ar u mise$_i$
toy-NOM Taroo-to buy-GER be-NONPERF store
(i) cannot be understood as meaning the store in which someone bought a toy for Taroo, and he or she keeps it, e.g., at home.

[12] See Chomsky (1981:312-314) for his second suggestion. It assumes that a reanalysis of [*easy to* V_i] as AP takes place with the empty element being another type of anaphor.

[13] The stipulation that an empty operator is base-generated at the object position in the clausal complement is motivated by (i), where the verb *take* subcategorizes for NP *care* as a QUASI-argument.
(i) *?Much care is easy to take of the orphans.

The *tough* sentence that contains a *quasi*-argument NP as subject cannot be formed, as not in a *wh*-question with a quasi-argument NP, as *wh*-phrase, as in (ii).
(ii) *?What is easy to take of the orphans?
See Chomsky (1981:311) for other motivations, e.g., *wh*-island effects.

[14] As in English, there is a piece of evidence that supports the assumption that an empty operator is to be postulated as in a *wh*-phrase.

(i) *?zyuubunna ki ga mawari no hito ni
sufficient consideration-NOM surrounding-GEN-people-DAT
tsukaw ite ar ita.
use-GER be-NONPERF
Lit., 'Sufficient consideration is done toward the people around there.'

(i) *?zyon ga mawari no hito ni nani o
John-NOM surrounding-GEN-people-DAT what-ACC
tsukaw ita ka.
use-PERF-Question
Lit., 'What did John use for people around him?'

(iii) zyon ga mawari no hito ni zyuubun na ki o tsukaw ita.
sufficient consideration-ACC
'John was sufficiently considerate to the people around him.'

[15] Evidence for the empty operator movement will be given later.

[16] Future research is needed to determine what the syntactic status of this *ga*-marked NP is, as in the English *tough* construction.

[17] This is motivated by the fact that nominative cannot appear when the VP is an *ite*-marked constituent, e.g., in sentences whose matrix verb is complex predicate *ite moraw* in Japanese.

[18] Lasnik & Saito's 1992 ECP analysis and Chomsky's idea that non-lexical I(nflection) and C(omplementizer) also heads a maximal projection with Spec work together.

[19] I assume here that the ECP is in effect determined at LF, differently from Chomsky's 1986 analysis and Lasnik & Saito's 1992 γ-marking analysis that the ECP is in effect determined at S-structure for A-positions, and at LF for adjuncts, perhaps as a consequence of the Projection Principle. Nothing in this paper motivates the assumption that intermediate traces for adjunct should be eliminated at LF, whereas intermediate traces for arguments should not be eliminated at LF.

[20] This is an example from Chomsky (1986:20). Since the trace is not antecedent-governed, it must be theta-governed. In order for this to be possible, VP must be theta-governed by Infl.

[21] If it is assumed that VP is not L-marked, then it can be a blocking category. However, in Chomsky 1986, VP-adjunction is used. In this case, another intermediate trace is postulated in the example in the text. See Chomsky 1986 for further discussion.

[22] See Chomsky (1986:92) for the assumption that there is only one specifier position in CP, as required by *Who did John like her when?* in contrast with **Who when did John like her?*

[23] If the *moraw* ('receive') is assumed to subcategorize for infinitive IP instead of CP, all the discussions in this paper hold the same for the ECP.

[24] Note that the proposed analysis together with ECP also makes a correct prediction of (i) in contrast with (ii).

(i) nyuugaku ga yakusokus ite ar ita hitobito (a noun phrase)
admission-NOM promise-GER be-PERF people
'those people who have been promised admission to'

(ii) gakubu ga nyuugaku o sono hitobito ni yaskusokus ita.
department-NOM admission-ACC those people-DAT promise-PERF
'The department promised admission to those people.'

In (i), the trace is theta-governed since the verb *yakusokusur* ('promise') subcategorizes for NP and PP[DAT *ni* ('to')]. Thus, ECP is satisfied.

[25] This section is an answer to a question put by Christopher Collins and James Yoon to previous versions of this paper.

[26] Shibatani 1978 proposes an analysis of the *-ite moraw* sentence. My analysis of the *ite moraw* ('receive') sentence basically follows his analysis, especially the claim that the *ite*-marked VP is the object of *moraw*. As he points out, the analysis parallels the typical sentence that contains *moraw*, as below.

(i) zyon ga mearii ni hon o moraw.
John-NOM Mary-LOC book-ACC receive-NONPERF
'John receives a book from Mary.'

In the *ite moraw* sentence, *ite*-marked VP occurs in place of the accusative-marked NP in (i).

[27] The sentence in the text may be hard to understand, and is yet grammatical, similar to *The cat that the dog that the man hit hit hit fish*. See Chomsky 1965 for such an example with his judgments.

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THE USE OF ENGLISH IN WRITTEN FRENCH ADVERTISING: A STUDY OF CODE-SWITCHING, CODE-MIXING, AND BORROWING IN A COMMERCIAL CONTEXT

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This paper provides an analysis of language-mixing as it appears in written French advertising, using studies on the use of English as a pair-language with French and other languages (e.g., Spanish, Portuguese, Hindi, Japanese, Thai, Arabic) as a point of departure. The analysis provided here suggests that the English used in non-Anglophone advertising is a rich source of linguistic data that is unique because of morpho-syntactic features generally untolerated in conventional written or spoken discourse. Evidence is presented to draw attention to the unusual structural techniques associated with English borrowings, code-mixing, and code-switching in specific advertising slogans in France and the role that English plays in this particular medium. Constraint-oriented theories and counter-arguments are also addressed, along with various socio-psychological motivations for choosing language-mixing as an alternative communicative strategy.

1. Introduction

Although linguistic investigation of code-mixing as it specifically applies to advertising has been somewhat limited thus far, the idea of promotional material being 'cross-cultural' is well-established. In their advertising textbook orginally published in 1961, Dunn and Barban (1974:602) commented that:

> [In regard to] advertising activities that cut across national boundaries ... , it has been suggested that 'cross-cultural' is a better term than 'multinational' or 'international' in that markets are often better defined by cultural or demographic variables than by political boundaries.

A large part of the research in code-mixing has, of course, been limited to spoken discourse (e.g., Poplack 1980; Pfaff 1979; Valdes-Fallis 1976). There are, however, a number of scholars who have taken an interest in this phenomenon in its written manifestation as it appears in advertising copy, including Bhatia 1987 who has studied the commercial use of English in India, Takashi 1990 who has conducted linguistic analyses of Japanese advertisements, and Martin 1998 whose Ph.D. dissertation treats English/French code-mixing in advertising in France. They are among the many researchers inspired by the work of Geoffrey N. Leech 1966 who devoted considerable time and effort to the detailed analysis of English used as a language of commercial persuasion. In the spirit of such research, this

paper will suggest that the English used in the advertising of non-English speaking countries is a rich source of linguistic data that is unique because of the violations of stylistic restrictions one often encounters. Furthermore, the linguistic and cultural content of advertising slogans discovered through a careful examination of phonological, morphological, syntactic, and semantic patterns also enables one to tap people's attitudes toward language and society.

The analysis presented in this paper pertains specifically to the use of English elements in written French advertisements in France, a phenomenon that persists despite the French government's repeated efforts to curb the influence of English on the French language.[1] After a brief review of previous research in this area, specific code-mixing techniques will be introduced as they apply directly to French advertising, using various slogans as examples. This discussion will also draw the reader's attention toward the unusual structural qualities of commercial language and the probable reasons for which English plays such an important role in advertising around the world.

The data for this analysis were largely drawn from recent issues of the French weekly magazine *L'Express*. Also included are a number of code-mixed items discovered by Blanche Grunig (1990:73-226) in her linguistic investigation of advertising slogans in France. For the purposes of this analysis, written advertising was chosen over television and radio for several reasons. First of all, it is easier to manipulate than audio and visual recordings. Secondly, it is a relatively important marketing strategy. French companies generally spend approximately twice as much on newspaper and magazine advertising as on television and radio commercials (Mermet 1988). Thirdly, in the interest of providing as detailed an analysis as possible, it seemed more beneficial to focus on code-mixing and code-switching in written material, an area often ignored in research. Indeed, the structural flexibility of the code-mixed slogans found in advertising makes it extremely interesting from a linguistic point of view. Those who write advertising copy enjoy what Leech 1966 referred to as 'copywriter's licence'. This carte blanche authorizes them to (i) experiment with orthography, (ii) invent new lexical items, (iii) produce language which appears nonsensical, and/or (iv) use the intrasentential switching of roles and registers, in addition to many other options, all of which provides a fascinating linguistic mixture for analysis.

2. Code-mixing 'constraints'

With regard to past research in code-switching and code-mixing, there are a number of issues that relate directly to advertising that warrant our attention, such as the controversy over code-mixing constraints, motivational factors, and general attitudes toward code-mixing.[2] Regarding code-mixing constraints, Poplack 1980 proposed what she referred to as 'equivalence', 'complementizer', 'free morpheme', and 'conjunction' constraints on code-mixing. Poplack and other proponents of constraint-oriented theory have claimed, for instance, that borrowed constituents must adhere to the constituent word order of the host language. However, in the following example of intrasentential switching in Kinshasa-Lingala/French discourse (Bokamba 1989:279), the adjectival noun phrase

"deux fois" does not obey the Lingala constituent order, which would have been the opposite:

> Mobali na yó *a-téléphon-àkà yó deux fois par jour.*
> 'Your husband *calls you twice a day.*'

The following sentence, a mixture of English and French, reveals the same violation of word order rules (Bokamba 1989:282):

> He presented a paper *exceptionnel.*
> 'He presented a(n) *exceptional* paper.'

There are others who have suggested that these constraints are by no means universal and fail to take into account the contexts in which switching occurs, among them Saville Troike (1982:65):

> The fact that exceptions have been reported for almost all constraints yet posited suggests that most researchers may have been sociolinguistically naive in not taking the contexts of switching into account [and therefore] a study of variable contextual constraints on switching may be fruitful.

Written advertising is certainly one of these contexts.

3. Motivational factors that trigger language-mixing

When using advertising copy as research data, it is also important to take into consideration possible motivations for code-switching and code-mixing with English. Much research has been done to determine precisely when bi- and multilinguals engage in this behavior in various types of discourse. In his study of English words as they appear in the Arab press, Peters 1988 found that English is often used when referring to the following domains: science and technology, various consumer products (such as shampoo, perfume and after-shave), sports, games, architecture, most service industries, food, politics, clothing, the military, and business. Valdes-Fallis 1976 also considers switching as being related to topic and found, for instance, that English/Spanish bilinguals often lapse into English when discussing computers.

Switching as it occurs in written advertising will often depend upon the targeted audience (e.g., age, sex, socio-economic status, etc.). Many have discovered the persuasive and manipulative power of English in advertising (Masavisut *et al.* 1986; Bhatia 1987; Larson 1990; Checri 1995; Martin 1998), which has been the object of detailed discourse analysis. The functions of code-switching and code-mixing are also discussed throughout the literature. Bokamba (1989: 287), for instance, describes the following motivations for switching and mixing of languages:

1. To express the first word or idea that comes to mind
2. To convey more accurately one's emotional state
3. To appropriately obey rules governing interactional norms and communicative domains.
4. To communicate effectively in certain multilingual speech

communities where many languages are mutually unintelligible.

Other reasons for engaging in code-switching and code-mixing, enumerated by Saville Troike 1982, include (i) ethnic or group identification, (ii) for 'humorous effect', and (iii) quotations, all of which are heavily exploited in advertising copy. To this list of code-switching functions, Cheng & Butler 1989 add the following: (i) the exclusion of other parties, (ii) the elevation of one's perceived social status, and/or (iii) a change in roles. Many of the different classifications of the functional aspects of conversational code-mixing found in the literature can be directly applied to advertising.

4. Attitudes toward mixing

One of the most relevant issues in advertising, however, is consumer reaction to advertising copy. What, precisely, are people's attitudes toward code-mixing in particular? Kachru 1986 claims that many of the attitudes toward language stem from the roles it has played in a given community and suggests the following categorizations: (i) DISLOCATIONAL (whereby English slowly replaces another language), (ii) CONFLICTIVE (as occurs in some instances in India when politicians use English as a bargaining tool) or (iii) PARALLEL (the rarely equalized relationship between all existing languages in a country, such as in Switzerland). Kachru also proposes a number of models that can be utilized to relate a particular variety of language to society, notably the CORRECTIVE MODEL, the DOMAIN MODEL, the CONFLICT MODEL, the FUNCTIONAL MODEL, and the VERBAL-REPERTOIRE MODEL. (For a more detailed discussion of these models, see Kachru 1986).

Attitudes toward code-mixing differ from one communicative context to another. Whereas one's use of code-mixing in some instances may indicate a higher socio-economic status, Kamwangamalu 1989a, and Bokamba 1989 — among others — indicate that language-mixing has become the norm (and may even be necessary) in many multilingual areas, including those (such as the United States) where monolinguism is considered desirable. In some communities and/or communicative contexts, the mixing of English with one's native language indicates prestige, modernity, or solidarity. Bhatia 1992 has provided numerous examples of this in advertising in India, Takashi 1990 in Japanese advertising, Thonus 1991 in Brazilian business names, and Martin 1998 in French advertising, among others.[3]

In their analysis of the influence of English in Thai media, Masavisut, Sukwiwat, & Wongmontha 1986 discovered that products advertised in English are generally considered more reliable and of superior quality. Furthermore, for a number of items used for hygiene as well as various technical products, no adequate lexical items exist in Thai. These would include words such as: dental floss, shampoo, xerox, computers, etc. Additional problems include the rigid structure and meaning-specific tones of the Thai language that do not lend themselves easily to creative rhyme schemes and/or seductive melodies.

Those who write for the media are often guilty of exploiting various cultural and linguistic stereotypes. In India, for example, Bhatia 1987 reports that French

and Hindi are sometimes chosen over English to promote the idea of tradition and reliability, as the use of English in Indian advertising could convey the idea of shallowness often associated with westernization. Kachru 1986 provides an interesting list of stereotypical attitudes regarding the English language:

LABELS USED TO SYMBOLIZE THE POWER OF ENGLISH

POSITIVE	NEGATIVE
national identity	anti-nationalism
literary renaissance	anti-native culture
cultural mirror for native cultures	materialism
modernization	westernization
liberalism	rootlessness
universalism	ethnocentricism
technology	permissiveness
science	divisiveness
mobility	alienation
access code	

Generally speaking, researchers agree that English in advertising is interpreted as a symbol of modernization, efficiency, and/or reliability. However, the situation is somewhat more complex than it appears. Bhatia 1992 reports, for instance, that writers of Hindi ad copy distinguish between MODERNIZATION and WESTERNIZATION, carefully expressing the latter primarily through visual cues, rather than by inserting English elements. Reliability, on the other hand, is often associated with deep-rooted Indian tradition, an idea conveyed through the use of Sanskrit in Hindi advertising. As for Japanese advertising, foreign elements are often written in Katakana, rather than with the hiragana symbols commonly used for writing in Japanese (Bhatia 1992). Clearly, one must consider the possibility of using various scripts when analysing code-mixed advertising copy. Other issues that need to be taken into account are the products being advertised, the assumed degree of bi- or multilingualism of the targeted consumer population, and culture-specific attitudes toward a variety of languages, in addition to English.

When examining advertising from a linguistic point of view, one finds that non-Anglophones' attitudes toward English in a general sense can also be revealing. A most intriguing survey on Asian attitudes toward English was conducted by Shaw 1981. Over 800 students from Singapore, India, and Thailand, studying in 12 different universities and colleges, completed a questionnaire designed to reveal the various reasons they had chosen to study English. The results seem to indicate that the English language has taken on a life of its own, divorced, as it were, from its corresponding ideology. Out of a list of 25 possible reasons for studying English, the LEAST popular among all three groups in Shaw's 1981 study were the following (Shaw 1981:111):

1. 'I studied English because I like the countries in which English is spoken.'
2. 'I studied English because I like the people who are native speakers.'

3. 'I studied English because it will help me to think and behave as native speakers do.'

The three MOST popular reasons for studying English were (Shaw 1981: 111-2):

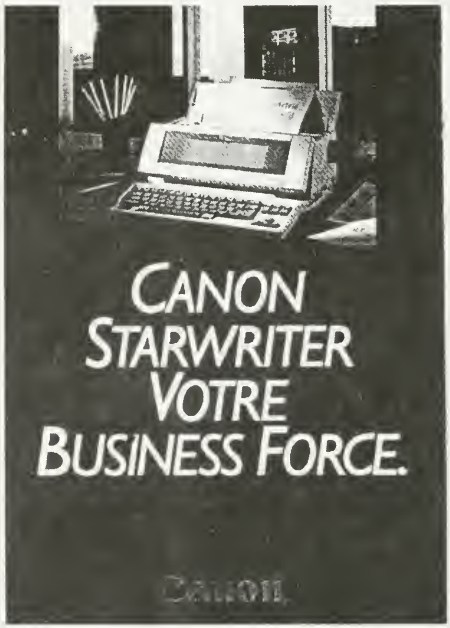
1. 'Because I will need it for my work ...'
2. 'To talk to native speakers and/or foreigners for business and educational reasons ...'
3. 'It is required in our system ...'

Obviously, the strongest motivation for learning English in this case was a desire to use the language purely as a means of accessing and sharing information in an international market.

5. The appeal of English in French advertising: Some recent examples

How do the French feel about English invading their culture? According to Mermet 1988, approximately 50% of the French population view British and American lexical borrowings as a threat to the French language. Nearly 45%, however, embrace the idea of welcoming such words into their language, considering it a part of the natural evolution and enrichment of their native tongue.

Figure 1.



Indeed, new English words are being assimilated into the French language at every moment: *zapper*, *zapping*, *fan-club*, *high-tech*, *joint-venture*, *top niveau*, *top secret* (Mermet 1988:67). One could argue that a great number of them can

be linked to science, business, or technology. Indeed, many French copywriters today intersperse English business terminology with French copy to create an image of efficiency. Most likely, the English word *business* was inserted into the advertisement for Canon typewriters shown in Figure 1 to imply a certain competitive edge.

Figure 2.

Monsieur le Président,
vous avez Washington en ligne directe.

Oui, Monsieur le Président Directeur Général, à partir du 19 mai, chaque jour à 12 h 35, vous pourrez entrer en communication directe avec Washington en prenant le nouveau vol direct de United Airlines, venu s'ajouter à notre Paris-Chicago. Et en plus, Monsieur le Président, étant donné que la grande compagnie américaine a la volonté de faire décoller les affaires internationales, United Airlines peut vous emmener également vers plus de 200 destinations aux Etats-Unis dont Seattle, Los Angeles, San Francisco, New York et Miami... Alors, dès que vos affaires vous appellent dans nos Etats, pensez United ! Avec encore 2 lignes : numéro téléphone Paris : 48.97.82.82, numéro vert : 05.01.91.38, appel gratuit.

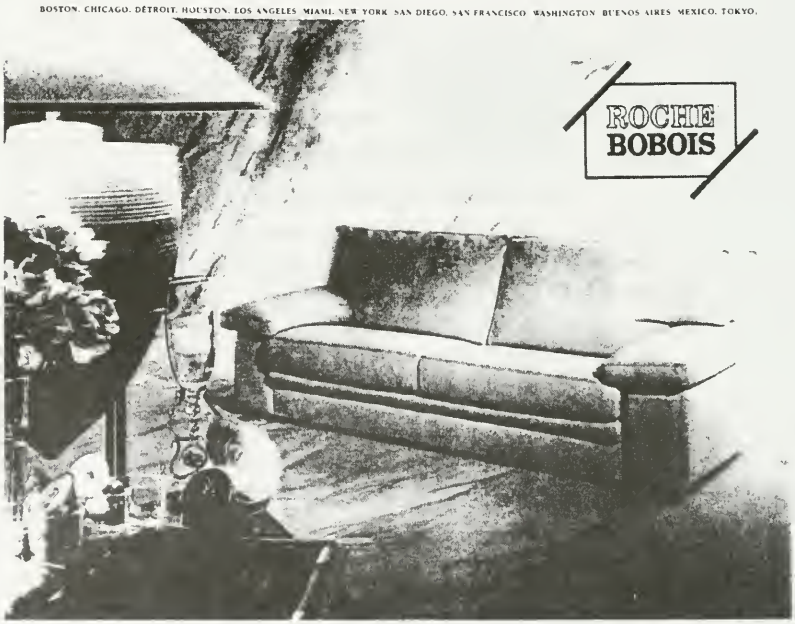
UNITED AIRLINES

PARIS CDG 1 - WASHINGTON TOUS LES JOURS EN VOL DIRECT.

Copywriters are also forced to consider certain consumer characteristics when designing code-mixed slogans. Stereotypes, self-fulfillment, intellectual curiosity, narcissism, etc., all are cleverly taken into account when targeting a particular audience. For instance, those who write ad copy for French magazines are careful to avoid cultural references unfamiliar to their audience, well aware of the

prestige that intellect enjoys in French society. Through their choice of words, and indeed their choice of one language over another, advertising copywriters attempt to flatter their readers, leaving them with the impression of being well-informed and sophisticated, worthy of products that exude an aura of elegance and elitism. For instance, the mere mention of American cities in a French advertisement gives products a more modern, and almost inaccessible, image. The ad for United Airlines in Figure 2, in which Washington, D.C. is mentioned three times, accompanied by Chicago, Seattle, Los Angeles, San Francisco, New York, and Miami, illustrates this technique.

Figure 3.



Similarly, a string of American cities (Boston, Chicago, Detroit, Houston, Los Angeles, Miami, New York, San Diego, San Francisco, and Washington, D.C.) line the very top of the ad in Figure 3 for Roche Bobois leather sofas. If one looks carefully, one notices, however, that not a single one of the distributors listed at the bottom of the page is located in the United States.

Although the use of English is extremely rare in French advertisements for food products, a recent advertisement for mustard (Figure 4) uses English in labels

Figure 4.

PARFUM DE

MOUTARDE

1. Sauce moutarde à la suédoise à base d'oseille et d'épices, idéale pour le saumon, pot de 200 g, 46,50 F (Faechen).
2. Louit : grand classique, moutarde Diaphane, pot de 200 g, 18 F.
3. Marcel Recerbat : moutarde rhodanienne composée d'épices et de tomates pour accompagner fondues et grillades ; au citron vert pour l'élaboration des sauces ; au vin de Xérès idéale pour les plats cuisinés, 200 g, 14,80 F (La Grande Epicerie de Paris).
4. Fauchon : aux trois épices, pour les viandes et les volailles, pot de 200 g, 20 F.
5. Moutarde violette de Brive au moût de raisin, pot de 200 g, 28 F (Fauchon).
6. Hédiard : moutarde au safran, idéale pour les poissons, pot de 100 g, 14,80 F ; aux olives et aux anchois, pour viandes et poissons frits, 13,50 F.
7. Monoprix Gourmet : à l'estragon frais, idéale dans les vinaigrettes, pot de 200 g, ou au poivre vert idéale pour déglacer les fonds de sauces, 4,75 F.
8. Fauchon : miel, de préférence avec les viandes blanches ; aux herbes pour les sauces légères ; au fenouil pour les poissons grillés, pot de 200 g, 16 F.
10. Colman's Mustard, farine de pot de 113 g, 25 F (Fauchon).
11. Menes : moutarde de qualité, belle sélection ; Redune extra-forte, verte à l'estragon et aux fines herbes, pot de 200 g, 15 F.
12. Marks & Spencer, moutarde anglaise, pot de 145 g, Saint Michael, 11,50 F.
13. Savora : condiment composé de douze aromates, 12 F environ.
14. Delaeus Fils : au vinaigre de cidre, idéale pour la cuisson des poissons ; forte au poivre vert, pour les viandes rôties, 5,65 F le pot de 100 g (Lafayette Gourmet).
15. Amora : moutarde fine et forte, grand classique, pot de 300 g, 11 F environ.
16. Delaeus Fils : à l'estragon et herbes de Provence, 13,50 F

ADRESSES

Hediard 21 place de la Madeleine 75008 Paris Tel. 42 66 44 36
Lafayette Gourmet 52 bd Haussmann 75009 Paris
Fauchon 26 place de la Madeleine 75008 Paris. Tel. 47 42 60 11
Faguais Maison 30 rue de la Trémoille 75008 Paris Tel. 47 20 80 91
Albert Menes 41 bd Malesherbes 75008 Paris Tel. 42 66 95 63
La Grande Epicerie de Paris 38 rue de Sèvres 75007 Paris Tel. 45 44 38 65
Marks & Spencer 35 bd Haussmann 75009 Paris

PAGES DIRIGEES PAR MARTINE ALBERTIN
AVEC LA COLLABORATION

(see item No. 10) to lure customers who are finicky about their condiments to an exclusive, and extremely expensive, American supermarket (Fauchon) in Paris.

Figure 5.

GRANDS AMATEURS DE PIN'S

Venez chercher votre Pin's HILTON
au Bugatti Bar
en dégustant le cocktail du "Jour"
dans une atmosphère chaleureuse, détendue et musicale.

L'équipe du Bar Bugatti.

LE JARDIN

VOTRE ESTOMAC VOUS RAPPELLE A L'ORDRE.

l'équipe du restaurant LE JARDIN est à votre disposition
jusqu'à 24 heures.
(à l'occasion d'un concert ou d'un spectacle
au Palais des Congrès et de la Musique)
Un buffet de salades, fromages et pâtisseries
saura vous ravir
avec un service efficace et rapide.

BON APPETIT ET BONNE FIN DE SOIREE !

STRASBOURG

HILTON

Avenue Herrenschmidt à Strasbourg
Téléphone : 88.37.10.10.

One also finds a number of morphological transformations in code-mixed advertising. *Pin's*, a very popular advertising tool in France, is used as a singular and plural noun indiscriminately in French advertising, ignoring altogether it's

possessive quality in English. The advertisement in Figure 5 promises the reader a free Hilton *pin's* if he or she comes in for a cocktail.

Figure 6.

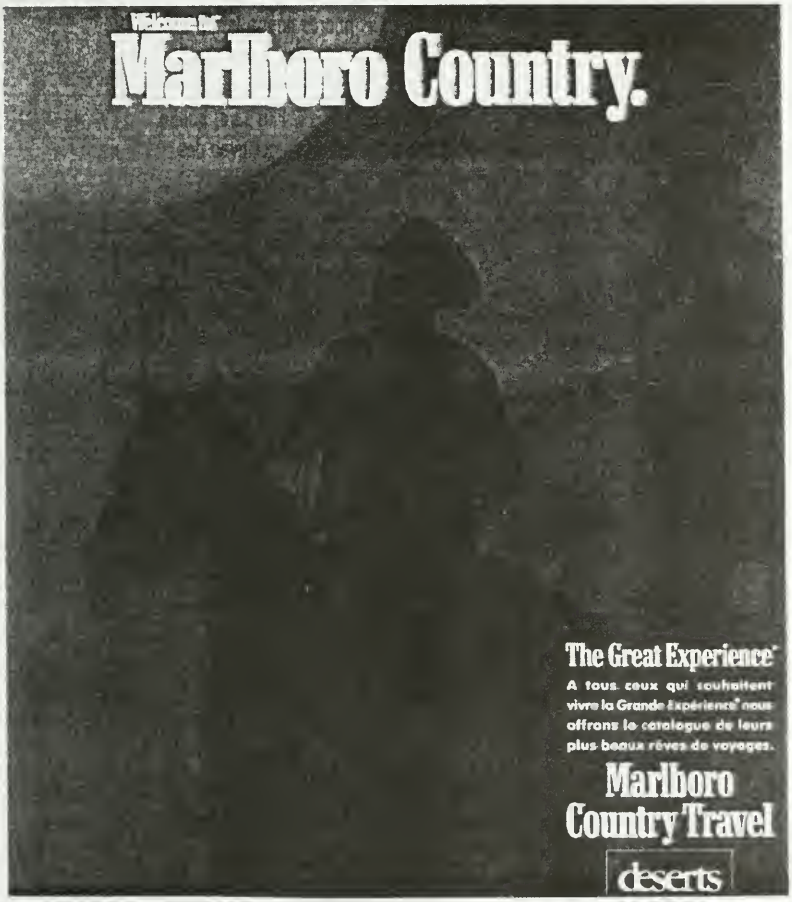
Another code-mixing technique found in advertising which takes into careful consideration the phonological system of the host language (in this case, French) consists of spelling English loan-words *à la française*, in other words, in such a way that a native French speaker who pronounces them will unknowingly

produce an English word or phrase. Consider, for example, the France Telecom advertisement for call-waiting in Figure 6. Approximately halfway down the page we find the word *beep*, written *bip* in French, to elicit the desired pronunciation.

Figure 7.

Some French written advertising uses more English than others. The beer advertisement in Figure 7, for instance, uses advertising copy written entirely in English. As in most cases, the slogan appearing in bold print is as simplistic as possible, and is likely to be understood by the majority of its readers. In the closing sentence, we find many cognates, used to facilitate comprehension.

Figure 8.



A Marlboro cigarettes advertisement (Figure 8) also effectively uses English words that are readily intelligible to those who do not know the language. The story behind Marlboro's very successful international marketing campaign is an interesting one. When these cigarettes first appeared on the market, they were favored more by women than men. In order to increase their share of the market, the company hired a new agency whose objective it would be to create an image of Marlboro as a cigarette for the rugged outdoorsman. Executives from the agency,

sporting tatoos, were among the first men to appear in these new Marlboro ads (Dunn & Barban 1974:238). Marlboro has since become a household word in France, where practically everyone is familiar with the rugged-looking cowboys associated with Marlboro advertisements. This Marlboro ad provides a classic example of code-switching. As is customary, the English words chosen are easily recognized and understood by non-English-speaking French readers, and effectively whet the consumer's appetite for 'la Grande Expérience' awaiting them in the Western United States.

Figure 9.

Another slogan using easily recognizable English words appears in the advertisement in Figure 9 in which the distillers of Ballantine's Whisky have chosen

to use the expression *17 years old*, which — although it does not particularly resemble its French equivalent — is likely to have been a part of everyone's English lesson at school at one time or another, and has the additional advantage of conjuring up images of tradition and exclusivity.

Figure 10.

How do the French view advertising in general? Mermet 1988 argues that the younger generation is perhaps more appreciative of this creative medium of expression, but also that the French as a whole, though they consider it an eco-

nomic necessity, tend to seek entertainment in this persuasive medium. For many French natives, advertising is appreciated as a form of art, and is meant to favorably mirror society in a way that is reassuring to them. As a result of this mutual understanding between copywriters and consumers, the latter often end up being

Figure 11.

more enthusiastic about the decoding of criptic messages embedded in advertising than about the actual product itself. Stretching the imagination is often of utmost importance. To illustrate this point, compare the French ad for Benson and Hedges cigarettes in Figure 10 to the American cigarette ad in Figure 11 — published by the very same company in *Newsweek*. Indeed, it is not uncommon to encounter French advertising in which the product being promoted is neither mentioned nor visible.

Specific code-mixing techniques applied to advertising copy

Part of the beauty of French advertising is the choreographed quality of advertising designs. Shapes, colors, lighting and text are meticulously juxtaposed to produce the most alluring effect possible. The text itself, however, reveals some intriguing structural characteristics when closely examined. Indeed, there are a number of systematic code-mixing techniques used in written French advertising to attract the reader's attention. These techniques may involve:

(i) the strategic distancing of sounds and/or text
(ii) the use of English to create rhyme and rhythm
(iii) the integration of English words into the grammatical structure of the French language
(iv) homophones
(v) existing and deceptive cognates
(vi) alternation of speech roles
(vii) translation
(viii) creative orthography
(ix) slightly altered idiomatic expressions
(x) irregular plural and possessive forms
(xi) English brand names.

A few recent slogans (Appendix 1) might be useful to illustrate these methods. (The English equivalents of these slogans also appear in Appendix 1):

In Slogan 1, one immediately notices the English-looking word *Hitburger*.

Slogan 1: *Hitburger: le plus hit des burgers.* [Hitburger]
(Grunig 1990:73)

A very subtle means of reinforcing the name of this product in the reader's mind is to repeat the brand name, in two separate parts, later in the slogan:

...le plus hit des burgers

Slogan 2 appeared in a recent advertisement for France Telecom.

Slogan 2:

1st page: *Elle n'est pas souvent chez sa fille dans l'Illinois*
2nd page: *Mais elles prennent souvent le café ensemble.*
[ATT] [France Telecom International]
(Grunig 1990:226)

In this particular case, the copywriter decided to spread the text across two pages instead of one, a very wise choice indeed in that it cleverly reflects the longing and separation felt by a mother in France and her daughter living across the Atlantic in the state of Illinois. Not only does one see an American state mentioned in this ad, but one also experiences a blending of cultures, as the daughter is so fortunately able to partake in those frequent long conversations over coffee, so typical in French society, directly from her American living room, because of this telephone company's supposedly low rates.

Those who write advertising copy often opt for code-mixed slogans in an effort to create rhyme and/or rhythm. Consider, for example, Slogans 3 and 4:

Slogan 3: *Coca cola, c'est ça* [Coca Cola]

Slogan 4: *Quand j'entends le mot traffic, je sors mon automatic*
[Peugeot]
(Grunig 1990:179-80)

Whereas the Coca Cola slogan is simply a direct translation from English ("Coke is it!"), the Peugeot advertisement uses the words *traffic* and *automatic* according to the English spelling and definition. It should be noted, however, that *trafic*, normally spelled with ONE 'f' in French, is a word associated with smuggling and/or drug trafficking, and when coupled with the English-looking word *automatic* conjures up images of gangsters in American movies, which have been quite popular in Europe.

Sometimes an already assimilated English expression (such as *sex appeal*) will give birth to a new borrowing as part of the process of creating an enticing advertisement. In Slogan 5, *sex appeal* has been transformed into *text appeal* for the purpose of advertising a popular women's magazine:

Slogan 5: *Un magazine qui a du text-appeal* [Femme]
(Grunig 1990:123)

Occasionally, as in Slogan 6, innovative French adjectives create the need for language-mixing in order to produce a desired rhyme:

Slogan 6: *Très mode, très fourmi, très polo, très fancy*
[Volkswagon "Polo"]
(Grunig 1990:81)

In this case, the English word *fancy* rhymes well with *fourmi*, (literally meaning 'ant-like'), when pronounced by the French.

Another means by which copywriters attempt to lure customers is the shaping of English lexical items into typically French grammatical forms. In Slogans 7 and 8, English adjectives, nouns, and verbs are considered equally appropriate as substitutions for French verb roots before the formal and/or plural second person verb ending *-ez*.

Slogan 7: *Free shoesez-vous* [Free-Shoes]

Slogan 8: *Snapez votre fil* [DMC]
(Grunig 1990:84-5)

Homophonous words are also characteristic of code-mixed French advertising. Note, for instance, Slogan 9:

Slogan 9: *Les hommes préfèrent les femmes au Lee* [Lee jeans]
(Grunig 1990:204)

In this particular slogan, for an American jean company, *Lee* is pronounced the same way as the French word for 'bed' (*lit*), which not only creates seductive undertones but also clues the reader as to how the brand name should be pronounced.

Also found in code-mixed French advertising are deceptive cognates. In Slogan 10, presumably for computer games on the French Minitel network, the English word *GAME* is a direct translation of *jeu* in French, and also rhymes with *gamme* (meaning 'selection' in English) when pronounced according to the French phonological system:

Slogan 10:

36.15 + GAME. La plus grande gamme de jeux sur Minitel. [Minitel]
(Grunig 1990:204)

In Slogans 11, 12, and 13, we see a number of English loan-words that are easily intelligible to a native French speaker:

Slogan 11: Original emotions are rare [MDM]

Slogan 12: The nobel scotch whisky [Clan Campbell]

Slogan 13: Oui, je swatch. En smoking, talking, dancing mais sans darling [Swatch]
(Grunig 1990:204)

This is quite possibly an attempt on the part of the copywriter to avoid any misinterpretation. Indeed, it is very important in advertising to maintain a readable style that can be easily assimilated and heard in one's imagination. Chances are the English words in these slogans would be pronounced, or at least imagined, with a French accent. Furthermore, Slogans 11 and 12, written entirely in English, would seem to encourage readers to believe that the English language is nothing more than French words pronounced with a foreign accent, with the exception of a few articles and verbs, a ploy pointed out by Grunig 1990. This deceptive device is essentially a form of flattery, for the reader is left with the impression that he or she understands a certain level of English with no difficulty.

As in Slogan 7, certain parts of speech in Slogan 13 adopt alternate roles. For instance, the English-sounding brand name *Swatch* becomes a verb, and the English participle *smoking* becomes a noun ('tuxedo') in French. As an added effect, the word *en* has a double significance, *En smoking* referring to 'BEING DRESSED IN a tuxedo', and *en* [...] *talking ... dancing* meaning 'WHILE talking and

dancing'. The final noun *darling* was probably imported by English-speaking soldiers during World War II, and creates the needed rhyme for the slogan.

Although the majority of English loan-words embedded in French advertising slogans are immediately understood by the reader, mysterious lexical items will sometimes require a certain amount of decoding. In Slogan 14, for instance, the English name of a French communication firm is simply inserted in the text (involving once again the use of an English verb as a French noun) as if it naturally belonged there. Only those with some knowledge of English would catch the subtle translation of the word *become* into French (*devenir*) appearing at the end.

Slogan 14: *Pour Become communiquer c'est devenir* [Become]
(Grunig 1990:204)

In Slogan 15, we have another example of English expressions spelled *à la française*, as we saw with the word *beep* in the France Telecom call-waiting ad earlier:

Slogan 15: *Let's truites again* [Pays de Galle]
(Grunig 1990:204)

We have here an advertisement to lure tourists to Wales. As *truites* means 'trout' in French, the entire slogan, if literally translated, would be interpreted as 'Let's trout again', or 'Let's go trout fishing again.' However, the more likely intended message was probably 'Let's twist again', the title of a very popular song in the late 50s and early 60s known to most of the advertisement's targeted audience: middle-aged potential travelers.

Similarly, to obtain the proper pronunciation of an English word, it may be embedded in a formulaic expression existing in the French language, as occurs in Slogan 16 for <Stylomines> pens and pencils.

Slogan 16: *You see what I mine * (Vous voyez ce que je veux dear)*
[Stylomines Conté]
(Grunig 1990:204)

If each of the two sentences had been written in only one language (the first one in English and the second one in French), we would have had:

You see what I *mean* (Vous voyez ce que je veux *dire*)

The word *mine* (which, in French, actually carries several meanings, including the lead of a pencil) is essential to the slogan, for it refers the reader to the brand name [Stylomines Contés]. Adding the English word *dear* on the end was a clever way to balance the slogan.

One of the greatest joys of the French people (and indeed of many other cultures) is that of using idiomatic expressions in everyday communication. The French take great pride in the structural and phonological flexibility of their language, and enjoy manipulating it for humorous effect. This is particularly evident in advertising. A code-mixed version of this phenomenon appears in Slogan 17 , where the French word *bouche* (meaning 'mouth' in English) has been replaced

by a former American president's last name, pronounced, of course, *à la française*, drawing it nearer to the pronunciation of the French word for 'mouth':

Slogan 17: *Buvez l'Amérique à pleine Bush;*
Bush la bière des hommes de l'Ouest [Busch beer]
(Grunig 1990:203)

A change in spelling in the brand name (undoubtedly to accommodate the play n words) and the stereotypical image of the western United States make the slogan even more effective.[4]

As we have seen in other slogans (for example, 7 and 14, above), products in France often carry English names that are, of course, easily articulated according to the French phonological system. Slogan 18 is yet another example:

Slogan 18: *Snacks. C'est tellement bon qu'on fait des bonds* [Snacks]
(Grunig 1990:201)

The same is true in other countries around the world. In a 1987 study of 1200 Asian ads, for instance, Bhatia found 90% of product names appearing in English. In some cases, however, 'western-sounding' words used in Asian advertising copy are not English at all, but rather lexical innovations designed to create a favorable brand image. The following are some pseudo-anglicisms recently used in product names in France (Martin 1998):

Hydra-stick	(lip balm)
Pressing Pro	(clothes iron)
Silk-épil Comfort	(woman's razor)
Satin-Up	(bra)
Miel Pops	(breakfast cereal)
Anniversong	(personalized cassette with "Happy Birthday")

In the case of the French, specifically, there are certain dangers one encounters when composing code-mixed advertising copy. Regardless of the code-mixing techniques one chooses to use, there exist several traps that copywriters systematically avoid. First of all, an English word which is inserted in a French slogan without the necessary phonetic clues is likely to be pronounced *à la française*. Upon reading Slogan 19 for [Well Stockings], for instance, a French reader will undoubtedly guess the vowel sound [ɛ], in the word *Well* , due to the French word *belle* appearing at the end, but is very likely to pronounce the *W* as a *V*:

Slogan 19: *Je suis Well. Collant Well. Bien et belle.* [Well Stockings]
(Grunig 1990:202-3)

The end result can sometimes be a product with a split personality, being referred to by some shoppers as *Well* and others as *Vell* (Grunig 1990:202-3).

Another trap that is easy to fall into when writing ad copy is the over-indulgence in the creative aspect of the text, at the expense of actually convincing the consumer to buy the product. The risk is that advertisements will become

pure art, instead of achieving their ultimate goal: selling the product! (Grunig 1990:238). Leech's (1966:71) advice to copywriters is direct and to the point: Keep the slogan SHORT, SIMPLE, FAMILIAR, and CONCRETE.

7. Implications and future research

This brief analysis of code-mixed advertisements in France has shed light on several areas. It has already been recognized, for instance, that language-mixed advertisements are essentially a mirror of society, enabling the observer to gain a clearer understanding of attitudes toward language and culture. Comparative analyses of advertising from various cultures could also yield interesting results.

Future analyses of code-mixed advertising could investigate the socio-psycholinguistic impact of the manipulative use of pair-languages for commercial purposes on readers of different linguistic and socio-economic backgrounds. The linguistic properties of code-mixed slogans that are actually processed by readers and the effect they have on memory are — with the exception of a small study by Petrof 1990 — unexplored areas of research. An interdiscisciplinary approach may be the most effective way of conducting such an analysis. Finally, it would be interesting to see whether the existing relationship between French and English in the advertising medium is similar to that of other languages. The identification of cross-cultural lexical, syntactic, morphological, and/or phonological universals in code-mixed advertising would provide a valuable set of guidelines for advertising copywriters, researchers interested in commercial and/or linguistic analysis, as well as foreign language teachers wishing to exploit advertising in their classroom.

8. Conclusion

Indisputably, the English used in French slogans illustrates that advertising copy can be a rich source of linguistic data on code-switching, code-mixing, and loan-words because of the various morpho-syntactic and phonological features untolerated in conventional written or spoken language. It is also quite possible that the motivations for choosing English as a pair-language in code-mixing for the purpose of advertising are somewhat different from those involved in speech, and therefore warrant additional inquiry. Furthermore, it could be argued that by examining the phenomenon of code-mixing in French advertisements, one discovers the attachment French people feel to their native language as well as other aspects of their mentality. Their intellectual curiosity, insatiable appetite for *des jeux de mots* (puns) and appreciation for subtle nuances, for instance, are far more evident in these code-mixed advertising slogans than any affinity for an Anglophone lifestyle. However, in spite of their mixed feelings regarding the materialism and superficiality so often ascribed to the American society, for example, the French seem to take great pleasure in incorporating new English words into their vocabulary, and are more than willing to utilize them to expand their repertoire of marketing strategies. Finally, in view of the specific (and often consistent) properties and functions of code-switching, code-mixing and borrowings found in advertising, it may be conceivable to label language-mixed advertising as a variety in its own right, rather than as an aberration.

NOTES

[1] For discussions on language legislation in France, see Martin 1998; Nelms-Reyes 1996; and Kibbee 1993.

[2] For an extensive bibliography of research on code-mixing and code-switching, see Kamwangamalu 1989b.

[3] For a more detailed discussion of the 'power' of English in various communities throughout the world, see Kachru 1981, 1986 and Kamwangamalu 1989a.

[4] For a more detailed discussion of anglicized product names in France, see Martin 1998.

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APPENDIX 1.

Code-mixed slogans (Grunig 1990:73-226):

1. *Hitburger: le plus hit des burgers.* [Hitburger]
'Hitburger: the popular burger.'

2. *Elle n'est pas souvent chez sa fille dans l'Illinois. Mais elles prennent souvent le café ensemble.* [ATT] [France Telecom International]
'She isn't often at her daughter's home in Illinois. But they often drink coffee together.'

3. *Coca cola, c'est ça* [Coca Cola]
'Coke is it!'

4: *Quand j'entends le mot traffic, je sors mon automatic* [Peugeot]
'When I hear the word "traffic", I get out my "automatic".'

5. *Un magazine qui a du text-appeal* [Femme]
'A magazine with text-appeal.'

6. *Très mode, très fourmi, très polo, très fancy* [Volkswagon "Polo"]
'Very stylish, very small (literally "ant-like"), very "Polo", very fancy.'

7. *Free shoesez-vous* [Free-Shoes]
'Put on some Free Shoes.'

8. *Snapez votre fil* [DMC]
'Snap your thread.'

9. *Les hommes préfèrent les femmes au Lee* [Lee jeans]
'Men prefer women in Lee's.'

10. *36.15 + GAME. La plus grande gamme de jeux sur Minitel.* [Minitel]
'36.15 GAME. The largest selection of games on Minitel'

11. *Original emotions are rare* [MDM]
'Original emotions are rare.'

12. *The nobel scotch whisky* [Clan Campbell]
'The nobel scotch whisky.'

13. *Oui, je swatch.En smoking, talking, dancing mais sans darling* [Swatch]
'Yes, I wear my swatch. Dressed in a tuxedo, talking, dancing, but not with out my darling.'

14. *Pour Become communiquer c'est devenir* [Become]
'For Become, communicating is becoming.'

15. *Let's truites again* [Pays de Galle Tourism]
'Let's go fishing for trout again.'

16. *You see what I mine * (Vous voyez ce que je veux dear)* [Stylomines Conté]
'You see what I mean. You see what I mean.'

17. *Buvez l'Amérique à pleine Bush;*
Bush la bière des hommes de l'Ouest [Busch beer]
'Drink in America with intense pleasure.
Bush, the western men's beer.'

18. *Snacks. C'est tellement bon qu'on fait des bonds* [Snacks]
'Snacks. It's so good that you jump up and down.'

19. *Je suis Well. Collant Well. Bien et belle.* [Well Stockings]
'I look great. Well stockings. Nice and beautiful.'
(*bien et belle* also means 'undoubtedly')

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DISCURSIVE CONSTRUCTIONS OF KISWAHILI-SPEAKERS IN UGANDAN POPULAR MEDIA*

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While the Kiswahili language has played a key role in the linguistic 'decolonization' and national integration of postcolonial Kenya and Tanzania, its more dubious reputation in neighboring Uganda has stemmed from perceptions about its inherent 'deficiencies' and its use by imputedly dangerous or antisocial people (including the historically unpopular security forces). Dominant linguistic ideologies in Uganda, in contrast to those of its two neighbors, do not recognize local forms of Kiswahili as symbols of transethnic solidarity nor of local political identities. They cast them, rather, as linguistically and culturally deficient idioms that invoke coercive contexts, colonial class relations and official political terrorism. Representations of second-language speakers of Ugandan Kiswahili in popular media often draw upon stereotypes illustrating their supposed illiteracy, criminality, and 'foreigness' in constructing images of general linguistic, political, and moral decay.

0. Introduction

In postcolonial Anglophone East Africa, the Kiswahili language has proved itself of increasing importance as a practical medium and symbol of national integration and the decolonization of national political cultures. In terms of bridging social difference, Kiswahili has figured prominently, both in the formation of transethnic, nationalist/Pan-Africanist consciousness (horizontal integration) and in the creation of economic opportunities for individuals who lack extensive formal schooling in English (vertical integration). In this sense, the Kiswahili language has been expropriated from its original (coastal Islamic) milieu to new politico-cultural contexts in which its functions and social meanings are locally emergent and sociohistorically specific. Mazrui and Shariff (1994:72) note:

> The historical development of Swahili has given rise to new varieties of the language that are gradually becoming native to an increasing number of east Africans. The concept of a 'Swahili-speaking people', therefore, has now transcended Swahili ethnicity in the narrower sense of the term, even though it fits perfectly well with the Swahili multidimensional concept of *kabila*. This then has created a complex situation of new public affirmations and counter-affirmations about the boundaries of Swahili identity.

In colonial times, the East African military was a primary site of transethnic, regionalized identity formation, and its Kiswahili came be associated with a kind

of 'barracks solidarity'. This indexicality potentiated Kiswahili as political capital; it became the most conspicuous symbol of Nyerere's *Ujamaa*, or African socialism, and in Kenya, where it was made co-official language with English, Kenyatta ventriloquized important aspects of Nyerere's discourse in articulating his *Harambee*. This image worked in favor of the reputation of Kiswahili(s) in Kenya and Tanzania, where the security personnel were more ethnically diverse, and therefore perceived as more 'national'. But it worked perhaps to the detriment of Kiswahili(s) in Uganda, where the military was predominantly northern and Nilotic- or Sudanic-speaking, and in postcolonial times, was dominated in turn by the ethnicities of the successive regimes. Kiswahili's most dubious distinction came in 1973, when the military dictator Idi Amin Dada declared it to be Uganda's national language (although the decision was never implemented). When the East African Community broke down in 1977 (due to a riff in relations between Kenya and Tanzania), the regional impetus for the development of Kiswahili in Uganda did as well. More recently, however, the National Resistance Movement (which came to power in Uganda in 1985) has declared its intention to reintroduce Kiswahili as a compulsory subject in schools, and to informally promote it as a national lingua franca. As will be discussed later, the NRM regime is 'softpeddling' a program to rehabilitate Kiswahili in Uganda by linking it to popular initiatives in East African political and economic integration.

The nationalist/Pan-Africanist embrace of Kiswahili, however, has presented a perceived threat to the identity claims of the coastal ethnic Swahili communities on the one hand, and the multitude of inland ethnic communities on the other (most notably, the Baganda of Uganda). These respective lines of tension have been manifested in the emergence of a contested political terrain around definitions of Kiswahili identity, both between 'native' and second-language speakers and between second-language speakers and nonspeakers. Discursive anxieties around language use are very often the terms in which other sociopolitical struggles are waged; language issues become particularly sensitive in the context of competing sociopolitical interests finding political voice. Among the more than 20 recognized native Kiswahili dialects, the language of Zanzibar (*Kiunguja)* was chosen by the British as a model for the official administrative standard, and in the hands of post-independence Tanzanian language-planners it underwent rapid lexical elaboration and syntactic codification. As an 'improved' linguistic technology, Kiswahili became ascriptively 'neutral', as standardized, literary languages are often assumed to be. In this, however, the emergent standard became discursively disassociated from its coastal sources. And as their political and economic futures in post-independence Kenya and Tanzania have faced periodic uncertainty, coastal Swahili communities have resisted transethnic readings of Swahili identity. They have found unexpected allies in cultural activists from the East African interior who resist the encroachment of a regionalized transethnic identity on their own cherished ethnic identity claims.

The emergence of a standard Kiswahili has also figured in negative (re)evaluations of nonnative 'upcountry' (East African interior) varieties as corrupted versions of their coastal counterparts. One dominant discourse constructs the nonna-

tive varieties as a continuum of progressive linguistic 'decay' from Zanzibar to the Congo River. The well-known adage runs: 'Kiswahili was born in Zanzibar, grew up in Tanzania, grew old in Kenya, died in Uganda, and was buried in Zaire (now the Democratic Republic of the Congo).' And as nonnative varieties of Kiswahili have facilitated interethnic communication in increasingly multilingual urban contexts, perceptions have arisen about their role in the dilution of traditional forms of rural-based authority (that find their cultural expression in 'mother-tongues'). Thus, the constructed linguistic decay in urban centers (as manifested in emergent sociolinguistic hybridity and various forms of code-switching) is coarticulated in certain moralistic discourses with images of generalized social and moral decay. In some locales, *Muswahili* 'Swahili person' has come to denote any 'outsider' with ascribed subversive characteristics. Mazrui and Shariff (1994:81) note:

> The other level of language attitudes has to do with how a language triggers certain stereotypes about its speaker(s) in the mind of the audience. A classical example of this tendency with regard to the Swahili is described by Jaramogi Oginga Odinga, the first vice-president of Kenya, in his famous book *Not Yet Uhuru*. In particular, Odinga refers to some African adjuncts of the British colonial administration who used to 'invade' Luoland periodically to collect taxes. Precisely because these people were themselves not Luo and had no proficiency in the Luo language, they were forced to use a transethnic language of the common Kenyan. To the Luo this created the impression that the tax collectors were Swahili even though there is no record that the Swahili ever participated in collecting taxes in Luoland or anywhere else in Kenya. As a result of this association of the language with the ethnicity of the tax collectors, however, Odinga tells us that the Luo referred to the 'Swahili' people as *okoche* (1967: 2), a Luo word meaning 'vagabond, rogue and cheat'. As far westwards as Uganda, in fact, the Swahili language conjures up images of the *bayaye*, the lumpenproletariat, the underclass.

In as much as intensive multilingualism, sociolinguistic hybridity, and code-switching parallel the demographic and socioeconomic consequences of unchecked urban growth, moralistic discourses coarticulate images of linguistic decay with those of increased crime, prostitution, overcrowding, poor sanitation, alcoholism, the disintegration of families, and the miseducation of children. In this way, perceived linguistic problems are represented as the harbinger and/or source of more general social problems.

1. Kiswahili in Uganda

In the linguistic economy of Uganda, to an extent unparalleled elsewhere along the Kiswahili periphery, these discourses have constructed the Kiswahili language (and its second-language speakers) as the source of untold social degeneracy and mayhem. Ugandan Kiswahili, illiteracy, and criminality are three terms that commonly cooccur in social texts that take as a central theme Uganda's post-

colonial experiences of political turmoil and terrorism. Such texts appeal to a certain common-sense knowledge about the relation between language and social behavior. Fairclough (1992:84) argues:

> Texts postulate, and implicitly set up interpretive positions for interpretive subjects who are 'capable' of using assumptions from their prior experience to make connections across the intertextually diverse elements of a text, and to generate coherent interpretations.

In this paper, the 'interpretive principles' under consideration construct unlettered, Ugandan, Kiswahili-speaking, criminal identity in opposition to a literate, civically responsible, elite, urban, Anglophone identity based on formal Westernized schooling. To a limited extent, this elite Anglophone identity, because it has emerged in Kampala, the Ugandan capital, is at times also associated with proficiency with the Luganda language (the language spoken around Kampala). In the opinion of one prominent Ugandan literary scholar, the image of the uneducated Kiswahili-speaking urban proletariat took hold before that of the Kiswahili-speaking bandit (Abbasi Kiyimba, personal communication). The older image emerged in colonial times as immigrants came from all over East Africa to build the Mombasa-Kampala railway and to work in the industrial areas in Kampala's south suburbs. The second image, arising in postcolonial times as a northern-dominated, Kiswahili-speaking military waged political terrorism in Kampala, drew on the ascribed 'foreigness' of Ugandan Kiswahili implicit in the first to cast them as *bagwira* 'foreigners', and to position military culture in opposition to the civic culture of Kampala.

This oppositionality emerges in part from colonial linguistic ideologies that attribute to English efficacy as a tool of thought, in contradistinction to African languages, which are the idioms of emotional and cultural expression. In this sense, the languages that individuals command are understood to determine the extent of their intellectual abilities and leadership capacities. The discourses outlined above construct second-language speakers of English (and by association, Luganda) to be more civically responsible than second-language speakers of Kiswahili. As Spitulnik (1992:338), taking the example of discourses around language in Zambian radio programming, argues:

> . . . some languages are constructed as more 'intellectually equipped' and others as better suited for 'cultural expression' through their exclusive use for certain program types. Significantly, these perceived *qualities of languages* are entangled with particular *assessments of their speakers*, e.g. as rural people, urban consumers, 'illiterate', 'sophisticated', 'insignificant', etc., and I would argue that the two modes of evaluation are not really separable. These evaluations do not emanate strictly from radio, however, but are more directly grounded in the overall political economy of languages in the country, as linguistic competence (and membership in certain speech communities) structures access to education, labor markets, and political power.

Rationalizations of linguistic hierarchies tend to invoke popular sociolinguistic stereotypes of certain kinds of social actors and their ascribed social characteristics. Mazrui and Mazrui (1998: 156) note:

> The Baganda elite have regarded Kiswahili openly as the language of 'the lower classes' (*Bakopi,* Luganda for peasants) since Kiswahili was the language of the workplace and the market, and the language of soldiers from the barracks. Less openly, some Baganda aristocrats have also regarded Kiswahili as the language of 'lesser breeds' in the ethnic sense, the northern ethnic groups despised by such haughty aristocrats.

Myers-Scotton (1990) argues that rationalizations for the continued political dominance of ex-colonial languages in African countries (which include arguments about their 'neutrality' and 'efficiency') tend to elide discussion of the vested interest that small Westernized elites hold in the maintenance of a sociolinguistic 'glass ceiling' she terms 'elite closure'. Linguistic elite closure is one aspect of a structural inequality imposed by the limited availability of educational opportunities within political economies for which schooled linguistic practice licenses rights of speaking.

Much of the complexity of nation-building in Uganda is imposed by the material consequences of uneven development across ethnolinguistic regions and the discursive practices that construct oppositional social identities out of them. There is a widespread perception that Baganda (Luganda-speaking individuals) have had greater access to education, employment opportunities and political influence than other groups. This so-called 'Buganda Syndrome' continues to figure prominently in discussions about enduring structural inequalities and the feasibility/desirability of legislated attempts to redress them. The economic and political importance of Buganda, (the historical territory of the Baganda), however, has ensured the currency of Luganda as a lingua franca, primarily in southern (predominantly Bantu-speaking) Uganda. Kiswahili, the lingua franca of northern and eastern (predominantly Nilotic- and Sudanic-speaking) Uganda, the military and police forces, and the urban proletariat (including Kampala), has virtually no reading public and is allotted only two fifteen minute news slots a day only on the state-run Radio Uganda and Uganda TV stations. Rutooro, Luo, Teso, and more recently Lusoga have vernacular newspapers, and together with other Ugandan languages are well represented in Radio Uganda broadcasting, but not in privately owned radio broadcasting or any TV broadcasting. The simplified, lingua franca form of Kiswahili commonly spoken in Uganda has emerged from a sociohistorical context in which it has served the basic needs of interethnic communication, especially in the military and police barracks, trading centers, urban industrial areas, ethnically heterogeneous neighborhoods, transportation, and cross-border trade.

The location of Kampala, the colonial administrative and postcolonial national capital, in central Buganda has created opportunities there coveted by non-Baganda, and also provided the context in which a Westernized/urbanized/Kigan-

daized 'town' culture has emerged, envisioned by some as a potential basis for a national culture. Mazrui and Zirimu (1978:439) argue:

> Because the Baganda under the colonial administration had been a privileged group, and were allowed to retain considerable influence and prestige, their language in turn commanded derivative prestige, and many of the workers who came into the capital of Uganda felt they had to learn Luganda. Indeed, Kiganda culture favored the linguistic and cultural assimilation of newcomers. In one or two generations many workers who were descended from non-Baganda became, to all intents and purposes, native Luganda speakers and were absorbed into the body politic of Buganda.

In this way, issues of ethnolinguistic identity, urbanity, and social class intersect in the formation of linguistic elite closure, which in Uganda has in part regulated the boundaries of an elite, urban, Anglophone (and therefore partially Kiganda) identity based in Kampala. As manifested in occasional calls for the promotion of Luganda as an indigenous National language, this expanded 'Kiganda identity', as if by default, has sometimes stood in for a truly 'national' identity.

As successive northern-dominated regimes (Obote I, 1963-71; Amin, 1971-79; Obote II, 1979-85) waged political terrorism in and around Kampala from the 1960's through the mid-80's, the ascribed civic and moral respectability of elite, urban, Anglophone culture was constructed in opposition to the 'degeneracy' of northern-dominated, Kiswahili-speaking, 'illiterate', and criminally-inclined military culture. This discourse operated upon common-sense knowledge about the efficacy of formal Westernized schooling, and its scribal practices, in instilling civic spirit and moral character. Ugandan soldiers, typically unsocialized to schooled linguistic practices, were represented as the very antithesis of an educated citizenry. The language of the barracks suffered further disrepute. To this day, representations of Kiswahili-speakers in popular media generally cast them as criminals, illiterates, womanizers, prostitutes, drunks, or gun-happy (northern, non-Bantu) soldiers. This set of interdiscursive connections works up *Oluswayiri* (the Luganda word for Kiswahili) as an antisocial behavior. A distaste for the perceived language of both common and political criminals functions as a form of discursive resistance to the brutality and corruption of the postcolonial northern-dominated regimes. In linking the Kiswahili language with the street- and state-level criminality of non-Baganda immigrants and dictators, and positioning it in opposition to the literate, Westernized, civically responsible, urban, elite Anglophone (and Kigandaized) culture of Kampala, these discursive practices construct Kiswahili-speakers as somehow 'foreign'. In Luganda, the word *bagwira* 'foreigners' can apply to both non-Ugandans and non-Baganda. The growth in the number of non-Baganda in Kampala is often noted in the context of increased linguistic 'anarchy', illiteracy, crime, overcrowding, poor sanitation, prostitution, and the breakdown of rural-based forms of traditional authority.

2. Discursive constructions of Kiswahili-speakers

This paper will present a critical discourse analysis of three texts drawn from popular media (one an excerpt from a popular Luganda language TV sitcom, the second a newspaper article, the last a newspaper installment of a novel) that depict the two major ascribed characteristics of second-language speakers of Ugandan Kiswahili: their 'illiteracy' (constructed as a linguistic deficiency) and their criminality (constructed as a personal or cultural deficiency). 'Illiteracy' is used here in its most ideologically laden sense, i.e., as unschooled linguistic practice, including oral performances of nonnative and nonstandard linguistic varieties. The three texts achieve their characterizations precisely through invoking well-worn sociolinguistic stereotypes, of the 'illiterate' domestic servant, drug-dealer, and military dictator, respectively. In each case, the constructed linguistic deficiency frames the participation of the stereotyped character in an antisocial or criminal activity. In the first text, transcribed from the TV sitcom *That's Life — Mwattu,* Olanya, a drunken, womanizing, northern-born domestic servant, abuses his wife (and humiliates himself) in a highly simplified Luganda, repetitively punctuated by a small repertoire of Kiswahili connectors, adverbs, and interjections. The second sample, from the Health section of the state-run newspaper *The New Vision*, juxtaposes the inability to sustain a conversation in English (and recourse to Kiswahili) with the culture of drug abuse. And the third, from a book by Maria Karooro Okurut entitled *The Invisible Weevil* (which was prereleased in installments in the privately-owned newspaper *The Monitor*), invokes the darkest humor in the linguistic cariacature of Idi Amin Dada himself.

2.1 The tongue of '*Bagwira*' and lousy husbands

Although television stations have been operating in Uganda since the late 1950's, there has always been a dearth of locally produced programming, and especially so in Ugandan languages. Radio has been the medium most accessible to rural areas, both technologically and linguistically; TV has been primarily an English-language, government-run affair, and has always catered to the population in and around Kampala. Since the 1990's, however, with the advent of several privately owned TV stations, there has been a certain noticable growth in programming variety, although still relatively little of it in local languages.

One notable exception is the popular Luganda language TV sitcom *That's Life — Mwattu* . This program achieves at least some of its humor through invoking well-entrenched social stereotypes, such as those of the womanizing civil servant, the greedy South Asian businessman, the 'quack' *muganga* ('traditional healer'), the scheming teenage gold-digger, and the northern (*mugwira*), Kiswahili-speaking domestic servant. This analysis will focus on the discursive construction of the last in the character of Olanya, an ethnic Acholi who lives in the 'boys' quarters' of a mansion belonging to a Pakistani-born businessman. When working in the Pakistani's mansion, Olanya is the image of stoic deference, never invited to sit, and never comfortable sitting on his employer's furniture. Communication between the Pakistani employer and Olanya is always in English, generally in the form of an aimless rant from the former and short expressions of com-

pliance from the latter. Olanya's wife Fiona, an ethnic Muganda, lives with him in the 'boy's quarters' and seldom interacts with her husband's Pakistani employer. The linguistic economy of the household is partly structured by gender: Olanya speaks enough English to communicate with his employer at a basic level, but Fiona speaks no English at all. This language barrier itself is used in certain episodes to construct comic situations; it also defines a structural inequality between husband and wife in the realm of wage labor.

In the 'boy's quarters', however, an altogether different linguistic economy obtains. And as this second space is connected socially to the surrounding Luganda-speaking community, Olanya does not have exclusive control of the linguistic resources most valued there; rather, he has only a secondary (nonnative) socialization to their use. His tenuous grasp of the Luganda language continually places him at a disadvantage in dealing with Fiona's machinations, and those of her Baganda relatives and friends. Olanya's linguistic deficiency is juxtaposed to his general social ineptitude and gullibility. Olanya the compliant, subdued manservant of the mansion is transposed into Olanya the surly, ill-mannered and misogynist cuckold. Linguistically, Olanya the English-speaker becomes Olanya the *Mugwira*, the speaker of 'broken' Luganda laced with enough Kiswahili to make the intimation of linguistic deficiency and moral degeneracy complete.

It is worth noting here that the character who plays Olanya is himself a highly educated, native Luganda speaker, and actually does not speak any form of Kiswahili very fluently. For purposes of playing his role, however, he has caricaturized the lingua franca form of Luganda commonly learned by non-Baganda working in Kampala, and has exaggerated selected marked features to nearly complete consistency. Most noticable of these is the severe reduction in grammatical agreement; it is also worth noting that reduced grammatical agreement is the most noticable difference between second-language and native forms of Kiswahili. In a sense, then, the character of Olanya is *Oluswayiri*-izing his Luganda. As do most Bantu languages, Luganda displays more than twenty grammatical classes;[1] in Olanya's speech, they are reduced to one or two (namely, classes 7 and 9), making cultural and linguistic purists cringe and less heritage-conscious Luganda speakers just snort.

In the episode partially transcribed below, entitled '*Kwenda kwa dongo*' (Kiswahili for 'sleep on the floor!'), Olanya has been 'sent' a 'second' wife (Lena) by his village elders back in Acholi (northern Uganda), because he has failed to produce children with Fiona. Because she is an urban-bred Muganda, the elders doubt Fiona's 'character' (adherence to rural norms for gendered behavior), and so have found for Olanya a good 'village' wife. This development actually comes in the context of Fiona's recent affair with a Muganda *muganga* 'traditional healer' named **Kakinda**, whose name Olanya usually mispronounces as ***Kakinda***. Infuriated at having been made a cuckold, Olanya is taking his revenge by flaunting his affair with Lena in Fiona's face, and using it as a pretext for ejecting Fiona from her former rights in the household, including that of sleeping in her bed. Infuriated at now being treated like a domestic servant in her own house, Fiona becomes aggressively vocal, and so brings out the worst in her drunken, womanizing husband.

As the scene opens, Fiona is combing her hair on the bed late at night as she hears Olanya and Lena are coming in. As they enter, Fiona gets under the covers and pretends that she is asleep.

Luganda is given in normal font, Kiswahili is italicized, and English is bold-faced. Instances of agreement reduction in Luganda forms are indicated with italicized boldface: in most cases, the reduction is in grammatical class 9, although there are some in grammatical class 7.

(1) [Olanya and Lena enter, laughing drunkenly.]

01 O: *Wa jamaa*! Genda wali, *kwenda sana.*
oh brother go there go very
'Hey! Go there, go quickly.'

02 L: Olanya!
Olanya!' [laughs]

03 O: *Maama yangu, habari kwa muntu muzima sana.*
mother mine news of person sound very
'Goodness, what a very tough person (woman).'

04 L: Olanya!
'Olanya!'

05 O: *Kweli wa-na-tumia bwana--sasa*
truly they-pres-use mister now
'Lord do they drink--and now'

06 L: Olanya!
Olanya!'

07 O: *Sasa* ggwe ***e***-yingir-e. Eh, maama, *pole wuko, pole*
now you 9-enter-subj hey mama gently there gently
'Now you enter. Hey, mama, careful there, careful.'

08 L: **Am tired**.
'Am tired.'

09 O: **You're very tired indeed you're very tired**, *pole wuko.*
You're very tired indeed you're very tired, careful there.'

Lakini nze ***e***-ba-dde t-***e***-manyi nti ggwe ***e***-manyi ku-zinna *sana*.
but I 9-be-perf neg-9-know that you 9-know inf-dance very
But I didn't know that you really know how to dance.'

Lakini ggwe ***e***-ki-ko-ze bwe-n-ti. **Now I've got a real woman**.
but you 9-7-do-perf like-I-do now i've got a real woman
'But you do it like I do. Now I've got a real woman.'

Pole wuko.
gently there
'Careful there.'

10 L: **Olanya, it's been the best day, the best night, it's been interesting!**

11 O: Eee, *alaah! Maama yangu Fatuma*, *sasa* ggwe ***y***-ebak-ee-ko,
yes god mother mine Fatuma now you 9-sleep-subj-17
'Yes, by God! My mother Fatuma, now you sleep a bit,'

e-labika ***e***-ko-ye nnyo.
9-seem 9-weary-perf very
'you seem to be very tired.'

12 L: **Am even tired**.

13 O: **You're tired**--ggwe ***e***-ki-koz-e *sana, sasa* ggwe ***e***-yingir-e
you're tired you 9-7-do-perf very now you 9-enter-subj
'You're tired--you really did it, now you get in.'

[Lena gets up and goes to change in the next room; Olanya notices Fiona covered in the bed behind him]

Alaah! Wa jamaa! Maama yangu mimi, hi-ki ni ki-tu gani?!
god oh brother mother mine me this-7 is 7-thing what
'God! Oh brother! My mother, what is this thing?!'

What are you?! *Wee nani?! Alaah* ! Kisirani, *we toka*
what are you you who god curse you leave
'What are you?! Who are you?! My God? (You) curse, get out'

kisirani *wewe!*
curse you
'you curse!'

[Fiona pretends to wake up.]

14 F: N-*tok*-e ku ki?
I-leave-subj on what
'What should I leave?'

15 O: *Toka* kisirani!
leave curse
'Get out, (you) curse!'

16 F: Ki-ki kye-'m-ba n-*toka*-ko?
7-what 7rel-I-be I-leave-17
'And what is it I am getting out of?'

17 O: *Wa jaama*, ani ***ey***-a-ku-gamb-ye-ko oku-beera kwa ki-ntu ***e***-no?
oh brother who 9-past-you-tell-perf-17 inf-stay on 7-thing 9-this
'Oh brother, who told you to stay on this thing?'

Sasa nze ***ki***-ma-zze oku-goba-ko ggwe, ***e***-v-ee-ko!
now I 7-finish-perf inf-chase-17 you 9-leave-subj-17
'Now, I've already told you, get out of here!'

18 F: O-n-gob-ye-ko?! Ani gw'-o-manyiira?!
you-me-chase-perf-17 who 1rel-you-familiarizing
'You chased me from here?! Who do you think you are?!'

Nti o-n-gob-ye-ko!
that you-me-chase-perf-17
'You chased me from here!' [incredulously]

19 O: *Toka! Hi-i ni ki-tu y-ako? **E**-*no mwana ***y***-a bendi ***ki***-ee-se
leave this-9 is 7-thing 9-yours 9-this child 9-of elder 7-bring-perf
Get out! Is this thing (the bed) yours? This is a child of good family I've brought'

ki-ntu mu-pya era na ki-ntu ki-pya! Leka ggwe ***e***-yingir-e,
7-thing 1-new also and 7-thing 7-new stop you 9-enter-subj
'a new person and a new thing (the bedding)! You get out!'

Ggwe ***e***-yagala ky-a bwerere--*toka*! Nze n-ku-gamb-ye
you 9-want (something) 7-of free leave I I-you-tell-perf
'You want something for free--get out! I told you'

e-v-ee-yo!
9-leave-subj-loc
'to get out of there!'

20 F: Nga ku-ki kwe-n-va?
so loc-what loc/rel-1-leave
'So where am I getting out of?'

21 O: *Wa jamaa, o-na-taka ku-leta muntu taabu*. Nze ***ki***-ma-ze
oh brother you-pres-want inf-bring person trouble I 7-finish- perf
'Oh brother, you want to bring a person problems. I've already'

ku-gamba-ko ggwe, ku-mala ggwe, ***ki***-maz-e ku-genda na
inf-tell-17 you inf-finish you 7-finish-perf inf-go with
'told you for good, I'm finished with you, you've done'

ki-ntu ***mu***-kambwe na Kabinda, ggwe t-***e***-genda ku-dda-yo
7-thing 1-cruel with Kabinda you neg-9-go inf-return-23
'a cruel thing with Kabinda, you aren't going to again

ku-laba nze.
inf-see me
'to see me (my body).'

22 F: Ani gw'-o-manyiira?!
who 1rel-you-familiarizing
'Who do you think you are?!'

23 O: Nze t-***e***-yagala!
I neg-9-want
'I don't want (you)!'

24 F: T-o-manyiira, si-manyi n'-o-lyoka o-woza nti,
neg-you-familiarizing (neg)I-know and-you-forever you-say that
'Don't test me, I don't know why you're always saying that'

si-manyi, nze okw-ebaka.
(neg)I-know, I inf-sleep
'I don't know, I'm sleeping.'

25 O: *Kwenda kwa dongo!*
go to floor
'Get on the floor!'

As mentioned earlier, at least two characteristics of Olanya's speech set him apart from the more than fifty regularly appearing characters who speak at least partially in Luganda. First, Olanya is the only one whose speech evinces the kind of severe reduction in grammatical agreement seen in (1) above, and secondly, he is the only one who code-switches with a language other than English. Where grammatical agreement is entirely reduced to class 9 (as in line 09, partially reproduced for convenience as (2) below), the logical relations of verbal arguments become somewhat opaque. (2) is rendered in ordinary, grammatically correct, non-code-switched Luganda in (3).

(2) *Lakini* nze ***e***-ba-dde t-***e***-manyi nti ggwe ***e***-manyi ku-zinna *sana.*
but I 9-be-perf neg-9-know that you 9-know inf-dance very
'But I didn't know that you really know how to dance.'

Lakini ggwe ***e***-ki-ko-ze bwe-n-ti.
but you 9-7-do-perf like-I-do.
'But you do it like I do.'

(3) Naye nze m-ba-dde si-manyi nti ggwe o-manyi ku-zinna nnyo.
but I I-be-perf neg(I)-know that you you-know inf-dance very
'But I didn't know that you really know how to dance.'

Naye ggwe o-ki-ko-ze bwe-n-ti.
But you you-7-do-perf like-I-do.
'But you do it like I do.'

A particularly comic use of unlikely codeswitching comes in lines 13-16 (partially reproduced in (4) below), when Fiona 'mimics' Olanya by embedding his Kiswahili 'order' *toka* ('get out') in a morphologically robust Luganda verbal form.

(4) O: Kisirani, *we toka* kisirani *wewe!*
curse you leave curse you
'(You) curse, get out you curse!'

[Fiona pretends to wake up.]

F: N-*tok*-e ku ki?
I-leave-subj on what
'What should I leave?'

O: *Toka* kisirani!
leave curse

'Get out, (you) curse!'

F: Ki-ki kye-'m-ba n-*toka*-ko?
7-what 7rel-I-be I-leave-17
'And what is it I am getting out of?'

Ordinarily, Fiona never code-switches her Luganda with Kiswahili in the way that Olanya does. In embedding the root *toka* ('get out') in her verbal forms, she uses mimicry to belittle Olanya's domestic authority. In her revoicing of Olanya's verbal abuse, his attempt to project authority is represented as childish incompetence.

There are two main points to be made here about the role of 'code-switching' in the construction of the interaction. First, Lena, in contrast to Fiona, has received some basic schooling, and so speaks English at times (as in lines 08, 10, and 12), perhaps to project her 'worldliness'. Olanya attempts to follow her (line 09), but quickly reverts to his *Oluswayirized* Luganda. This indexes his inability to handle English casually, when he is master of his own circumstances. Rather, his English is really only adequate for the social role of an underling, as his immediate recourse to Kiswahili, the language of colonial-style servitude, further suggests. Secondly, Olanya's use of Kiswahili lexical items is relatively sparse until he starts chastizing Fiona (see lines 13, 21, and 25). The harshest remark he makes is purely in Kiswahili: '*Kwenda kwa dongo*'. The tendency of 'rough' Kiswahili to coincide with coercive contexts draws in historical memory of the circumstances of colonial class structure, when European and Asian settlers used to simply order Africans about without much concern for linguistic grace.

2.2 The tongue of the common criminal

The newspaper article *Mairungi causes jealousy* (see Illustration 1) addresses the recreational abuse, health consequences, and ambiguous legal status of the psychotropic plant known in the Luganda language as *mairungi*, and elsewhere in East Africa as *khat*. The article exhibits at least three major turns of voice: opening in an interaction between the journalist and *mairungi* traders in the bustling industrial area of Kisenyi in Kampala, it then moves to the discourse of medical diagnosis in the commentary of the *Journal of the Royal College of Physicians of London* and of the Head of the Department of Pharmacology and Therapeutics, Makerere University Medical School, and finally to the discourse of legal regulation in the commentary of the Secretary/Registrar of the National Drug Authority. Although this article is published in the Health section of the newspaper, it exhibits certain features more characteristic of a Leisure piece: beginning with the somewhat comical portrayal of the *mairungi* traders themselves (particularly their rough appearance and language), it moves to a general portrayal of the effects of chewing the plant (drawing upon popular images of drunken idlers), and finally refers to the infamous entropy with which the Uganda Police (fail to) approach law enforcement. For purposes of this analysis, the first two paragraphs are of the most immediate relevance, because it is here that the writer engages dominant common-sense knowledge about the relation between schooled vs. unschooled linguistic practice and social behavior. The journalist begins by portraying the intoxicated, unkempt, somewhat menacing Rasta-like countenance of one trader,

which is consonant with his inability to sustain a conversation in English: 'Obviously finding problems with English, he changes to *Swahili* ...' The trader's Kiswahili that follows is typical of that spoken in Kampala, but is comical in this context precisely because it is an inscribing of a generally unwritten variety. Further, its subject matter draws upon popular assumptions about what 'illiterate' people do with their time: get high, any way they can.

(5) 01 O-na ku-wa wewe mwenyewe. Kama o-na ku-la yi,
2ps-pres inf-be you yourself if you-pres inf-eat this
'You become yourself. If you eat this, you talk with'

02 o-na wongeya ya roho yako yote.
2ps-pres with talk soul your all
'all your soul'.

Stymied in self-expression by both his 'high' and his lack of formal education, the trader calls over his colleagues for help in conversing with the journalist. The other traders proceed to take great delight in projecting the erratic behavior of the journalist after chewing the *mairungi* leaves.

18 The New Vision, Monday, February 17, 1997

HEALTH

Mairungi causes jealousy

By Charles L. Wendo

"YOU take this you feel like," said a Mairungi (khat or Catha edulis) dealer on Kisenyi Road, his staring eyes, bushy beard and braided hair giving a scary appearance as he continuously chews the shiny green simple leaves measuring about two inches with irregularly toothed edges and reddish stalks.

Obviously finding problems with English, he changes to Swahili: *Ona kuwa wewe mwenyewe. Kama ona kula yi, ona wongeya ya roho yako yote.* (You become your real self. If you chew this, you speak out your mind).

As he calls Mama Peace, a female mairungi dealer at the next stall to explain further, another dealer with a clean-shaven head interjects: "You mean he is just taking it for the first time (laughter)? Chew it with cigarettes and Big G (laughter)." He turns to his colleague: "He will take two packets of cigarettes and twenty litres of juice" (prolonged laughter).

EFFECTS OF MAIRUNGI

- Vomiting
- Convulsions
- False sense of wellbeing
- Day dreaming
- Jealousy
- False perception

Mairungi is one of the most openly abused substances. On Kisenyi Road alone, over thirty middle-aged men and women sell it on stalls and verandas in an area surrounded by metalwork business. Many drivers and guards chew it to keep alert. Some people say they take it to potentiate sexual activity, yet others chew it simply out of idleness.

However, scientific evidence indicates that mairungi can cause mental disorders in man. A circular released by the National Drug Authority early this year with reference to the *Journal of the Royal College of Physicians of London* reads "The leaves of this plant mairungi contain an active substance METHACATHINONE which is like cocaine. Chewing large amounts causes paranoid psychosis." Paranoid psychosis is a mental disorder characterised by false perception and unwarranted jealousy.

According to Dr Odoi Adome, Head of Department of Pharmacology and Therapeutics, Makerere University Medical School, the substance causes a false sense of wellbeing and fearlessness, is addictive, and can cause vomiting and convulsions. "It causes a change in the normal thinking of a human being — like you are dreaming but you are not sleeping," he explained. "It falls under the category of substances of abuse."

"In small quantities, mairungi is a stimulant. However, when the stimulating effects are over, the person gets a blackout. We suspect it is the cause of many accidents. Police should come out to investigate this whenever there is any road accident," said Mr Ahan M. Kabogo, Secretary/Registrar, National Drug Authority.

As explained by Mr Kabogo, section 18 of the National Drug Policy and Authority Statute of 1993 prohibits possession of psychotropic drugs, of which mairungi is an example. However, law enforcement has been lacking. Furthermore, because the word mairungi per se does not exist in the document, many people opportunistically or erroneously interpret that the law does not prohibit its possession.

Efforts are being made to clarify the legal position of mairungi. "We are gathering scientific evidence so that we can ask parliament to legislate against cultivation and use of this plant," Mr Kabogo said.

A source at the Government Chemist and Analytical Laboratory who preferred anonymity said the mairungi chewers usually take it with alcohol and other drugs that government should address seriously," he urged.

The cost of mairungi indicates that it may not be for every Tom and Dick.

Betel chewing, a common habit in South East Asia, is a suspected cause of cancer. The effects of Mairungi are also as disastrous. WHO photo

Illustration 1. Kiswahili-speakers as *bayaye* (common criminals).

In juxtaposing the uninformed and self-destructive behavior of *mairungi* traders with the intellectual and moral authority of medical and legal experts, the article draws upon long-entrenched assumptions about the efficacy of formal Western-style schooling in the English language in promoting consciousness of personal responsibility and a greater social good. The opening depiction of the traders portrays *mairungi* use as rooted in a cultural deficiency, conceived mainly

as a lack of education. In invoking the discourse of medical diagnosis, however, the text now spins *mairungi* use as the source of a mental deficiency:

> A circular released by the National Drug Authority early this year ... reads: 'The leaves of this plant *mairungi* contain an active substance METHACATHINONE which is like cocaine. Chewing large amounts causes paranoid psychosis'. Paranoid psychosis is a mental disorder characterised by false perception and unwarranted jealousy.

As manifested in the person of the *mairungi* trader, the use of *mairungi* does nothing to help one's ability to sustain a conversation in English, which is how one would make sense to a more socially respectable person such as a journalist. Moreover, the language of the trader's 'false perception' (*Ona kuwa wewe mwenyewe* 'You are you yourself.') is the unlettered Ugandan variety of Kiswahili, which in the assessment of some Ugandan elites is not really a language at all. As the text turns to the voice of legal regulation in the words of the Secretary/Registrar of the National Drug Authority, *mairungi* chewing is now cast as the source or multiplier of other social ills, such as traffic accidents and alcoholism. The resonance of the *mairungi* trader's general social and sociolinguistic degeneracy carries forward in the reading, however; *mairungi* chewing, 'broken' English, and unlettered Ugandan Kiswahili are all implicated in traffic accidents and alcoholism, at least in the sort of ascribed cultural and mental deficiency that they index.

2.3 The tongue of the political criminal

The extract (see Illustration 2) from the novel *The Invisible Weevil* by Maria K. Okurut (prereleased in installments in the privately-owned newspaper *The Monitor*) reaches into Uganda's postcolonial historical memory in the way that it juxtaposes images of 'broken' English, snatches of Ugandan Kiswahili, illiteracy, and the darkest days of state-sanctioned political terrorism. Ugandans had suffered untold repression at the hands of the security forces under the first regime of Milton Apollo Obote (1963-71) by the time it was overthrown in a coup led by Obote's top military commander, Idi Amin Dada. Amin's rule began with widespread euphoria around its professed rejection of ethnic clientelism and its commitment to socialist democratic reform. Shortly, however, mass disappearances of government officials and civilians alike began to make clear that state-sanctioned political terrorism was only to get worse. It is during Amin's tenure that Kiswahili, in the mouths of AK-47-wielding, northern-born and relatively undereducated soldiers terrorizing civilians at roadblocks and arbitrarily arresting people in *pandagari* ('get in the truck') operations, began to be closely associated with state-sponsored violence. Moreover, the habit that soldiers had developed during Obote's regime of singling out ethnic Baganda for harassment (in Kiswahili) became a standard practice during this era. Most Ugandan soldiers were from the northern, Nilotic- and Sudanic-speaking regions which had been poorly served by the British colonial administration in the providing of educational opportunities. Ironically, the discourse of resistance that developed in opposition to the state-sponsored violence tended to equate the ascribed illiteracy of its leaders and sol-

diers with their corruption and brutality. And Amin, who himself spoke English poorly, but the Ugandan variety of Kiswahili very fluently, came to epitomize the coarticulation of ascribed sociolinguistic and moral degeneracy.

This installment gives a fictionalized account from the perspective of a group of secondary school students of that day in 1971 on which Amin took power in Kampala. After a huge explosion rocks the city (as Amin's forces destroy Obote's main armory), the eldest student, Mzee, tunes his radio to the state-run station, Radio Uganda.

> Marshal music filtered through. Then a voice came on, speaking slowly, almost like a child learning to talk.
>
> *Ziz is a speso announce—ment. The government spokesman wisez to inform all the piploz (peoples) of Uganda zata za Uganda armed forces led by his excellent major General Idi Amin Ada have tooks over (taken over) the government of Uganda. Zey have overthown za killing regime of Obote. Ze now president will swear at four hocklock dis morning. End of Speso announce—ment. By government spokesman.*
>
> From then onwards, the 'government spokesman' became a permanent feature on the radio. He would come on with all sorts of bizarre announcements, appointing and dismissing ministers over the radio, etc.

Later in the day when the students go to hear Amin sworn in as President at the Parliament, they find more reason to worry about the political future. This representation of Amin's speech is a caricature of the pretentions of uneducated political strongmen to a respectability historically 'earned' through formal schooling. His comically awkward, repetitive syntax and misapprehended denotations in English are immediately interpreted by the audience as an indication of his general political incompetence. His periodic resort to common Kiswahili connectors, adverbs, and pronouns (indicated in bold, with translations given in parentheses), might seem an attempt to project a populist pan-ethnic political persona, but to the audience it underscores the fact that he is an 'intellectually deficient' soldier playing the part of a politician.

> Amin smiled, took the microphone and addressed the nation:
>
> *Ladies under gentlemen,* ***Sasa*** *(**'now'**)I am very happy completely and also to stand here and undress you on this suspicious (auspicious) occasion. I not politician. I professional soldier, and man of few words.*
>
> *It has been for long time,* ***nani*** *(**'who'**) Obote* ***huyo*** *(**'this one'**) very bad also. I am sunk (thank) you very much but also I tell him* ***mimi nitafinish wewe*** *(**'I will finish you'**). Completely* ***Kabisa*** *(**'completely'**) and also. Me big daddy no ambition man to tell you the true, me Idi-Dada, big Daddy, I am good man, kind man completely and throughout.*

Amin's reign of terror unfolds

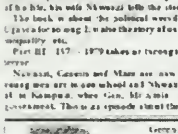
Following is the 12th part of the serialisation of Maria K. Okurut's *The Invisible Weevil*, a socio-humorical novel from pre-colonial Uganda, it takes us through independence, Idi Amin's regime, UNLF, Obote II upto the NRM administration.

The novel takes us to the suffering of Gonzaga Kwangyo, a young man fortunately not with AIDS. He has been brought from Kampala to his home in the village by the final few days of his life. His wife Nkwanzi tells the story.

The book is about the political world but has been titled Uganda for so long I, also the story of all the world's popular sympathy etc.

Part III 1971 - 1979 takes us through Idi Amin's reign of terror

Nkwanzi, Cassera and Mare are now in A level. The two young men are in one school and Nkwanzi in a different one, at Kampala, where Gen. Idi Amin topples the Obote I government. This is an episode about the events of the coup.



Maria Okurut, Author of The Invisible Weevil

Geresa noticed that many of the students were standing by the windows looking towards the city. Most probably scared by the ominous sounds: guns and lightning. As cowards were to peep out, the others, another very short step, threatened to uproot the house. All the students jumped in fright.

"Who set to thunders like this?" they wondered.

But to the majority, the people don't seem to know anything. That is the reason for how gunfire (Bwai mu bo Pesa) when President Obote I troops stormed the Kabaka of Buganda's palace. I was born in Kampala, this was not so for my cousins and sisters who were slightly older than the others. He was respected and revered by all because he seemed to have cats a top of things.

"Is it a coup or a counter-coup?" wondered them.

"What trouble do you think is becoming of the country?" they queried him. "It is incomprehensible terror," answered Mare gravely, wearing the wood or a piece of paper he did to see.

"A bigot! What on earth is that?" he is a big animal like a dinosaur" venture Jane butter-student Mare laughed.

"A coup means taking over government step by step of arms. Finally, it is a bigot who's who doesn't You see. "He was interrupted by heavy shelling and continuous gunfire. "It's terror you sounded like cars being zapped and cars the students named this particular sound "Pop-corn."

Mare shouted over the deafening noise and ordered the students

"Furthermore, the country all of you Gonzaga one beds," hurriedly rounding like some wedding officer.

The students had never heard the word coup before. Hearing the name of their dictator and Mare's voice coupled with the chilling noise, made the girls do merely were under the beds. Occasionally, sobs of fear could be heard from under the beds.

Then the cooks bang of all boomerang. The sudden shattered into millions of pieces. The students now knew that home, they were local. Most of them grew out for their mothers - always the first and last cry in many and pain. When the noise subsided, Mare gently freed not cautiously, feeling it is safe when he is not all that.

He then proceeded to look out of the window to see towards the city. The city was covered in heavy black smoke.

"Get out there under the beds cautiously. Do not step on broken glass with mamsters." They came out and looked at the black smoke that covered the city.

"The smoke...he been blown up. As smoke...a where did the army and go?" he confused.

He, but since the first rays of the sun were beginning to retreat Mare got the old radio and set to the news.

Gen Idi Amin Dada: in his maiden speech he said - she big daddy, no ambition a man to tell me the truth, me Idi Dada, big daddy. I am you man, kind man, simple daddy and through out the world

(File Photo)

NEW BOOK

Part Three: 1971 - 1979

THE INVISIBLE WEEVIL

By Maria Karooro Okurut

He went on Radio Uganda. Minister Mutesa Mukasa read through. Then a new voice, strong and steady, very soothing, almost like a child lowing, was to talk.

As it is your servant-in-chief. The government is spoiled-in-waiting to inform all the people (you people of Uganda) was to Uganda as we shall rest led by his excellency, general Idi Amin Dada, here under our Lord Almighty government of Uganda. Let's here everybody to talking regime of Obote. Let now negotiate, and I want to find his blood, da morning. And if you're an Obote supporter, our Lord Almighty spoils you.

From then on words, the "government spokesman" became a permanent feature in the radio. The world came to end and not to happen a moment-to-moment, appointing ministers and Bantustans when one by radio etc.

"That who is the Idi Amin?" Geresa asked Mare

"Actually I had ever heard his name before. Only I knew that he was a soldier. A man and he would regret in future. I heard them say so many things about this name and I am a engineer but will give you only facts.

Amin was picked on by the British and recruited into the KAR - the King's African Rifles. This was up back in the 1940s. The British picked on him because he was all and strong. They did not care that he was illiterate. In fact, they very liked their even better because a illiterate fellow was easier to manipulate. Years after, Amin got involved in the Mau Mau rebellion at Kenya and allegedly committed atrocities there. Later in the late sixties, it is said that the army government established Obote in hand-over Amin to them so that they try him for the atrocities. Obote is said to have refused. In 1966, when Obote ordered for Kabaka Mutesa's palace to be stormed, he put Amin in charge of the group operation and so Amin remained a Obote's good books.

But some people of rumors we said "Nope that he will be having like the future whenever means a snake when plaughing. The farmers covered the snake with soil. Later when it came to plant, the snake was still there and it bit him. I have only summarised the story of Obote and Amin," concluded Mare

Her students were now in a state of excitement. Mare was so tired that she and the students allowed them to go to bed. They prayed towards the east.

As Geresa related with Mare, Geresa felt a certain stopped and screamed.

"Wi...hoid" he cried.

"What is the matter?" asked Mare

"There is a dead-headed-snake here!"

"Don't look at it. Let's go" effort to plug out the deadly snake. Dead bodies were everywhere.

In the city, subduing gunshots prevented the terror. People sang

Amin mai ma wa, oo, oo, Mare wah

You have taken us out of the ooze of death. What the were real." Soldiers Chief Charles Oryema, drunking from meat which bottles, were, clean-shaven and all other forms of Arabs.

The next morning, they received a telephone and dances and made merry.

By crow's cock that afternoon, every body was screaming. Soldiers paraded the streets. The news had been going to be shown in The crowds that went for the swearing-in ceremony were unprecedented in the history of Uganda.

Amin Amin was sworn in that the third President of the Republic of Uganda. "Give and love words! Save our speak-ers," that carried the crowd. Amin smiled, took the microphone and addressed the nation.

Leaders under gentlemen, Salaa I am we, happy completely and one to meet here and address you on this auspicious occasion to assure you politicians of progress and cohesion and many of you words.

Now here for long time now I am thankful very much but about this is even more difficult

work. Completely Kabisa and also help is absolutely necessary even to help you. For me, me Idi Dada, big Daddy. I am good man, kind man compassionate and Armagedon.

Therefore I write to the Secretary-General of the United Nations Organisation and to Obote to go. Obote to the Diplomatic Mission, otherwise, Sorry my guests now, but I am again Kabaka for tomorrow.

I send you very big."

There was thunderous applause. Geresa and Mare had kept on pinching each other as Amin spoke on and on unintelligible. One man remarked. "Eh, my fellow who does not know English, how will he rule us?"

"But is English what rules us?" I said, "Was it not English and why he was ruled badly" said another

"It is not it, but the Parliament should be educated!" protested the first.

"I took when the educated leaders do not rule. Maybe the uneducated does not like letters," answered the other. That evening, BBC commented that on his swearing in ceremony, Amin spoke in a language similar to English.

"That does not matter me. Even if he spoke in vernacular it is a subject matter, what we want is somebody who will rule us without us keeping in constant fear of being killed. And I know he is good and he will be peaceful," said one. "I am not sure about that. There are so many dead bodies and they say things who must us to be done must blood."

Gen. Idi Amin Dada: in his maiden speech he said - she big daddy, no ambition a man to tell me the truth, me Idi Dada, big daddy. I am you man, kind man, simple daddy and through out the world

(File Photo).

In the months of the reign of terror, Amin's regime was known as Nkwanzi's village. Nkwanzi was caught in the middle as Jane became the calls to rescue of Mare. The final was to rescue Jane from Amin's hands and he would see word reached the ears and when Amin's brutal and it was all of a sudden, he could see

"Tarzan" he screamed only to be answered by the monkeys echoed those sounds and the cackle of voices.

Then began to flow it has turned. Desperate, he went on his knees and cried out to God

Tarzan in barren, I don't get water to drink this very minute, will soon because he's been taste skeleton. Father, I am afraid, feather. Please come on to fall so that he find is here with the monkeys. Another clap of thunder shook the sky and he woke up with a start he find he need with the tongue stretched out and panting like a dog.

What he thought was an overlapse clapped thunder was the whole structure of the hostel. So it had not been merely dreaming. It was going to rain after all. This was going to be quite a heavy thunderstorm.

Illustration 2. Kiswahili-speakers as political criminals.

Tomorrow I write to Mr. Queen of Englanda. I to tell her now Uganda also good Obote to go. Obote he thief, tribes (tribalism), drunco etc. Sunk you ***asante sana ('thanks very much')****. I tell to you again* ***kesho ('tomorrow')****, for tomorrow.*

I sunk you very big.

The listeners' commentary following Amin's speech, on the other hand, articulates essentially two voices: the first speaks to common-sense knowledge about the relation between colonial education and the 'training' of the African mind; the second resists that interpretation, pointing to the failure of the colonial education system to actually produce politically competent leaders. As noted above, formal schooling in English literacy had been widely assumed to engage and prepare the rational faculties of the African mind in a way that socialization to orality in indigenous languages did not. In early colonial times, the British administration and missionary establishment had exhibited a preference for Baganda recruits into the civil service, based upon essentialist assumptions about their 'educability'. Similarly essentialist notions about the 'warlike' nature of Nilotic- and Sudanic-speaking cultures (including Obote's Langi group and Amin's Kakwa group, respectively) dictated a preference for military recruits from northern Uganda. At the eve of independence in 1963, non-Baganda politicians suffered from a certain deficit of politico-cultural capital, whatever their actual educational qualifications, and so sought to compensate in symbolic ways for the perceived 'roughness' of their background. Amin's predecessor, Milton Apollo Obote (born Apollo Obote, but in his political career known as Milton Obote), so as to underscore his personal erudition, had added his first name after becoming enamored of the works of the English writer John Milton. The second commentator in the passage below gives voice to the disenchantment with such educated political strongmen, in whom formal Western schooling had apparently done nothing to instill a vision of indigenous democracy or sense of civic responsibility toward their fellow Ugandans.

> There was thunderous applause. Genesis and Mzee had kept on pinching each other as Amin spoke on almost unintelligibly. One man remarked: 'Eh, this fellow who does not know English, how will he rule us? '
>
> 'But is it English which rules us? Look, Obote knew English and yet he has ruled badly,' said another.
>
> 'Eh, but at least the President should be educated!' persisted the first.
>
> 'Look where the educated landed us, in trouble. Maybe the uneducated one will rule better', answered the other. That evening, BBC commented that on his swearing in ceremony, Amin spoke in a language 'similar to English'.
>
> 'That does not worry me. Even if he spoke in vernacular, it would not matter, what we want is somebody who will rule us without us keeping in constant fear of being killed. And Amin looks so kind we shall live

peacefully', said one. 'I am not sure about that. There are so many dead bodies and they say things which start in blood draw more blood'.

The words of Amin's detractor are prescient: within months, the state-run newspaper would abound with reports of 'rebel kidnappings' of politicians and civilians alike, and Amin would stage mock trials and very real executions of alleged perpetrators. Ugandan Kiswahili would now be indelibly associated in the national political imagination with the banging of rifle butts on the door in the dead of night, and the disappearance of family members who would never be seen again.

3. Conclusion

The three texts, in progressively stronger degrees, show the cooccurence of Kiswahili linguistic material in popular media together with representations of antisocial or criminal behavior. In this, they draw on discourses that have constructed oppositional sociopolitical identities out of sociolinguistic stereotypes, which ultimately place the source of Uganda's political turmoil of the last 30 years on the relative lack of formal Westernized education among the predominantly non-Baganda urban proletiariat and military. This represents a local adaptation of an received colonial ideology that equates schooled linguistic practice to intelligence and urban, elite social practice to the spirit of civic responsibility. As has been noted, this linguistic economy stands in partial contrast to those of Kenya and Tanzania, where Kiswahili is more deeply-entrenched, both as a first and a second language.

In 1995, a motion was introduced into the Constitutional Assembly to install Kiswahili as the national language of Uganda, and although it received a simple majority of delegate votes, it did not attain the 2/3 majority needed to pass. The vote broke down largely along regional lines: the north and east voted overwhelmingly for Kiswahili, the west supported it rather less overwhelmingly, and delegates from Buganda (central region) voted against it as a block. The discussions around the issue revived all of the old discourses that construct what has been referred to above as the 'Buganda Syndrome' — that Baganda have benefited inordinately from a political economy in which formal Western schooling and English literacy license rights of speaking, and that the installation of a 'neutral' indigenous lingua franca is necessary to 'level the playing field'. The delegates from Buganda, for their part, denigrated Kiswahili as spoken in Uganda as linguistically deficient and morally repugnant, and so unsuitable for any serious political or civic purpose. Failing in its constitutional initiative, the ruling NRM undertook to promote it as a mandatory subject in primary and secondary schools.

An important aspect of the rehabilitation of Ugandan Kiswahili is the rebuilding of public trust in the security forces, which continue to suffer from a reputation for corruption and indisciplined use of force. Interestingly, promotion in both the Uganda People's Defense Force and the Uganda Police is now tied to demonstrated ability to read and write standard Kiswahili as well as English. Since the East African Community was resuscitated as the East Africa Cooperation in 1996, the NRM has staked its political future within the ideological framework of

regional integration, a kind of step-child of the Pan-Africanism of the 1960's and 70's. In hitching its wagon to the sociopolitical and socioeconomic futures of Kenya and Tanzania, the NRM is participating in an attempt to redefine Swahili identity in transethnic and transnational terms. In doing so successfully, however, it will ultimately have to accommodate the cherished identity claims of politically powerful groups like the Baganda of Uganda.

NOTES

* An earlier version of this paper was presented at the 6th Annual Symposium on Language and Society — Austin (SALSA VI), on April 12, 1998,.

[1] Luganda, like other Bantu languages, has up to twenty three grammatical genders. The chains of agreement that the respective grammatical genders condition are illustrated in the examples below.

CLASS	EXAMPLE
1	*Omw-ana w-ange o-no omu-rungi a-buze.* 1-child 1-mine 1-this 1-good 1-lost 'This good child of mine is lost'.
2	*Aba-ana ba-ange ba-no aba-rungi ba-buze.* 'These good children of mine are lost'.
3	*Omu-kwano gw-ange gu-no omu-rungi gu-buze.* 'This good friend of mine is lost'.
4	*Emi-kwano gy-ange gi-no emi-rungi gi-buze.* 'These good friends of mine are lost'.
5	*Ef-fumo ly-ange li-no eli-rungi li-buze.* 'This good spear of mine is lost'.
6	*Ama-fumo ga-ange ga-no ama-rungi ga-buze.* 'These good spears of mine are lost'.
7	*Eki-taabo ky-ange ki-no ki-rungi ki-buze.* 'This good book of mine is lost'.
8	*Ebi-taabo by-ange bi-no bi-rungi bi-buze.* 'These good books of mine are lost'.
9	*En-koko y-ange e-no en-nungi e-buze.* 'This good chicken of mine is lost'.
10	*En-koko z-ange zi-no en-nungi zi-buze.* 'These good chickens of mine are lost'.
11	*Olu-limi lw-ange lu-no olu-rungi lu-buze.* 'This good language of mine is lost'.
12	*Aka-saale k-ange ka-no aka-rungi ka-buze.* 'This good arrow of mine is lost'.

13 ***Otu**-lo **tw**-ange **tu**-no **otu**-rungi **tu**-buze.*
'This good sleep of mine is lost'.

14 ***Obu**-saale **bw**-ange **bu**-no **obu**-rungi **bu**-buze.*
'These good arrows of mine are lost'.

15 ***Oku**-fumba **kw**-ange **ku**-no **oku**-rungi **ku**-buze.*
'This good cooking of mine is lost'.

16 ***Wa**-kati **wa**-no **wa**-li-**wo** emicungwa.*
16-middle 16-this 16-be-16 oranges
'Right here in the middle are oranges'.

17 ***Ku**-kitaabo **ku**-no **ku**-li-**ko** ebigambo.*
17-book 17-this 17-be-17 words
'Right (there) on the book are some words'.

18 ***Mu**-kitaabo **mu**-no **mu**-li-**mu** ebigambo.*
18-book 18-this 18-be-18 words
'Right (there) in the book are some words'.

20 ***Ogu**-sajja **gw**-ange **gu**-no **ogu**-rungi **gu**-buze.*
'This good giant of mine is lost'.

22 ***Aga**-sajja **ga**-ange **ga**-no **aga**-rungi **ga**-buze.*
'These good giants of mine are lost'.

23 ***E**-Kampala **e**-no **e**-ri-**yo** abantu abangi.*
23-Kampala 23-this 23-be-23 people many
'Right there in Kampala are many people'.

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AFRICAN LANGUAGES, ENGLISH, AND EDUCATIONAL POLICY IN NAMIBIA

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This paper takes issue with the assumptions underlying the English-only language policy stipulated in Article 3 (1) of *The Constitution of the Republic of Namibia* (1990), which provides for the education of Namibians, who belong to multilingual ethnolinguistic and socio-economic groups. Since this provision results from an interaction between the central government's espoused values and its perceptions of political and economic needs, the policy decision was arguably based on a reactive rather than a proactive approach to those needs. The emergence of English as the sole official language in Namibia was, therefore, not planned. Socio-political events shaped the needs of the country, and the language most capable of fulfilling those needs was therefore chosen. At no time was there a plan or planners to formulate language policy or implement change. This paper argues that (1) the policy is formulated vaguely, (2) it is a contradiction in terms with respect to cultural pluralism, on the one hand, and assimilation, on the other; and (3) there is an apparent neglect of the learners' first languages. The conclusion is reached that the choice of English as the main language of schooling in Namibia is not a result of planning within a more general plan of national development. A realistic approach might be to establish a body of planners, among them linguists and interested parties, that would study language needs in the country and seek to meet those needs, recognizing the status and development of ethnic languages for use in different domains, especially the formal system of education. Provision for language in education should be specified systematically through an overt language plan.

0. Introduction

From the beginning of German colonization in 1884 until the present time, there has never been an attempt by either the German or South African government to construct a national educational system based on equal opportunity for all Namibians regardless of racial or ethnic group. Moreover, South Africa not only maintained the separation that was present during the earlier occupation but intensified it, adding to it a tribal division. In the case of education, this division is seen clearly in the differing structures of separate commissions of inquiry, separate laws, the different types of schools and methods of financing, the differing de-

grees of compulsory education, differing standards and terms of service and pay for teachers that existed before independence; and differing provisions for the training of those teachers. Discrimination in education was not only the means by which knowledge was controlled by the apartheid regime, but also one of the ways by which a cheap labor workforce was maintained.

After independence in 1990, the present government of the South West African People's Organization (SWAPO), declared in its constitution for the country that the 'official language for Namibia shall be English' (Article 3*: Constitution, The Republic of Namibia*). Two criteria, unity and national development, seem to have influenced the choice of the English-only policy. The criterion of unity has not only influenced the formulation and propagation of the policy, but also the lack of any provision in the policy for vernacular languages for educational purposes, while the criterion of national development restricts the role of indigenous languages in education and emphasizes the importance of European languages.

Three assumptions seem to have been made by SWAPO regarding the role of indigenous languages in education from the viewpoint of national unity. First, it is assumed that in a multilingual context the choice of one of the indigenous languages as the national language is politically a highly divisive undertaking, since it will be interpreted by other language groups as a rejection of their languages. The second assumption concerns the colonial languages of wider communication. It is assumed that these languages, being foreign, are neutral, whereas the indigenous languages are associated with ethnicity, different social identities, and local loyalties. It is feared that the use of indigenous languages in education will encourage another form of apartheid and thus contribute to political instability. It is therefore suggested that the use of English in Namibia should be encouraged to promote national unity. However, some scholars (e.g., Bokamba and Tlou 1977) point out that in the case of Africa, the continued reliance on English as a unifying upper-class language may not provide a permanent solution, since it is socially restrictive and does not meet the need for national consolidation and popular participation. They also point out that the Europeanization of the media of instruction in African countries for the sake of national unity merely evades the central issue of national unity and the development of a comprehensive language education policy to fulfill complementary communicative roles of African languages

The assumption on which the criterion of unity seems to have been based not only favors the colonial languages of wider communication in one way or the other, but also ignores the multilingual reality of linguistically heterogeneous developing nations by imposing a one-language policy for national unity. The second criterion, national development, is based on favoring the languages of wider communication, such as English and French. These are considered languages of science and technology, of commerce and industry, of upward mobility and social prestige, and of diplomacy and international communication. The advantages, namely, accelerated economic growth and technological achievements, among others, it is argued, can be realized by the promotion of education through the European languages as the media of instruction. The emphasis on these lan-

guages implies that the use of indigenous languages as media of instruction would lower the standard of education, impede growth of science and technology, and retard the rate of national development. This is based on the further assumption that indigenous languages are not adequately developed. The implications of these assumptions will be examined below.

1. Language policy before and after independence

The legacy of the colonial language policy is so all-pervading that in most sub-Saharan African countries it affected, and in some cases paralyzed, subsequent policy decisions. Any examination of language policy therefore has to begin with the policy of the colonial administration. Namibia became independent in 1990. With a population of approximately 1.6 million inhabitants (Fourie 1997), it has over 18 indigenous languages and three foreign languages, namely German, Afrikaans, and English. Putz 1995 reports that there are seven main identifiable local language groups, namely Oshiwambo, Nama/Damara, Otjiherero, Kavango, the Caprivian languages (e.g., Lozi), Khoisan and Setswana, which comprise 87.8% of Namibia's speakers, and three groups speaking 'imposed languages' namely German, Afrikaans, and English comprising 11.2%. Of the total population, only 0.8% speak English as a mother tongue, whereas more than 50% of the population speak Owambo (Putz 1995).

There are three phases of language policy development evident from the period of colonial rule to independence. First, the arrival of the missionary groups and the role they played in the codification of the mother tongues. This phase included steps taken by the German colonial rulers (1884-1915) to support missionary efforts to use Namibian ethnic languages for basic education in a situation characterized by lack of teaching materials and qualified teachers. The second phase covers the period of the Union of South Africa's mandate from the League of Nations that lasted from 1915 to independence in 1990. During this period, apartheid policies of racial and ethnic discrimination led to the Bantu Education Act of 1953, which emphasized the development of indigenous languages as school subjects and media of instruction up to the primary school level. English and Afrikaans became official languages with greater emphasis on Afrikaans, while English, Afrikaans, and German were declared national languages. The indigenous languages were relegated to the status of tribal/ethnic languages with no socio-economic power of mobility. Upon independence, English was declared the official language and the main language of educational instruction from the fourth year of primary school up through the university level. Indigenous languages are to be used as media of instruction up to the third year of education and as subjects of study throughout the education system. These are the policies that are responsible for either encouraging or hindering the development of Namibian ethnic languages, education, culture, and modernization. Although the sentiment behind the choice of English to play the role of official and main language in education is understandable, it cannot, however, be condoned. The reasons for this have been discussed at length in (Bagmbose 1991; Bokamba & Tlou

1977; Bokamba 1981, 1984, 1995; Phillipson 1991; Phillipson & Skutnabb-Kangas 1995).

1.1 Vagueness of policy

The situation discussed in the foregoing section shows how complicated and unique the problem of language in education in Namibia is in comparison to other African countries. It is a heavily politicized issue as a result of factors such as apartheid, social inequality, and the war that was waged against the continued colonial occupation of the territory at the time the Constitution was drafted. Socio-political problems must have contributed to the failure of the present government to plan for language use in education. The emergence of English as the sole official language in the background of Namibia's linguistic heterogeneity and historical past was clearly not planned. Socio-political events shaped the needs of the country and the language best able to fulfill that need was therefore chosen.

Consequently, an examination of the policy guideline as stated in the Constitution shows that while the commitment to multilingualism is welcomed by the Namibian government, which is the body defining the language problems of this country, the policy does not make clear how it hopes to cultivate multilingualism in a balanced way. There is no demonstration of what specific language problems of the linguistic repertoires were perceived, hence the apparent failure to define and to characterize those problems. Therefore, no clear strategies and solutions are suggested to solve the problems. In essence this means that in Namibia, language-education policy and planning are not based on sound decisions, and it then follows that there cannot be suitable implementation strategies to effect the present decisions, and multilingualism is threatened with extinction and indigenous languages will survive only marginally or disappear altogether. Therefore, the situation created by the Namibian language-education policy contradicts the very philosophy of language planning. In order to exist and survive, multilingualism, a natural feature of linguistically heterogeneous societies, depends on the recognition of language diversity and its function in multilingual societies such as Namibia.

However, we should point out here that the Namibian government is in step with many sub-Saharan African countries in following a colonial model of language in education in which the continued reliance on a European language, in this case English, is perceived as a unifying factor in nation-building, since that language is perceived as neutral. Other arguments for retaining colonial languages involve modernization, efficiency, and expediency, where it is argued that European languages are the most developed and cost-efficient, and therefore the best qualified as media of instruction. Bokamba & Tlou 1977 observe that the continued use of English in Ghana, Nigeria, Uganda, and the use of French in Congo (former Zaire), to name just a few countries, has been justified for the same reasons. Nevertheless, although there is some validity to some of the claims, there are those (Bagmboṣe 1991; Bokamba & Tlou 1977; Bokamba 1981, 1984, 1995) who think it is unwarranted to conclude that English, or any other European language, must therefore serve as the medium of instruction,. According to Bokamba

& Tlou 1977 such policies not only constitute a major obstacle to the development of education in Africa, they actually militate against the establishment of mass education and permanent literacy (Bokamba 1981).

Within Namibia, discussion about language planning is only a recently acknowledged phenomenon. Putz 1995 reports that almost ten years before the advent of Namibian independence on March 21, 1990, the decision to implement English as the sole official language in the country had already been decreed in the document of the South Western Africa People's Organization (SWAPO) *Toward a language policy for Namibia. English as the official language: Perspectives and strategies* (UNIN 1981). Even though linguistic and functional arguments were outlined in the document as the main criteria for choosing English as the official language in Namibia, Putz states that it also has become obvious that the principal reasons for doing ideological and political. Here again, Namibia seems to be in step with the ideologies of other African countries. The political ideologies are often couched in the three arguments referred to earlier, efficiency and expediency, national integration, and modernization or national development (cf. Bokamba & Tlou 1977). Typically, governments avoid definitive statements in policy formulation. Bamgboṣe (1991:113) notes:

> If the policy is couched in sufficiently general terms, it may go down well, since it will be a 'catch-all' formula that may be interpreted in a flexible manner. Apart from the policy being vague, implementation is not likely to be a burden to anyone since it may not happen.

An example of a vague policy is Namibia's decision to adopt English as its sole official language and the main language of instruction in primary education without a prior inquiry as to its feasibility, given the country's historical background.

1.2 Language status

According to Haacke, the views and sentiments of the government regarding the role of ethnic languages as attested in the policies are not echoed by the broad population. He states (1994:245):

> This can be ascribed to the fact that the language policy in its essence was developed by party leaders who in exile were exposed to trends in post-colonial Africa and international debates on education. Understandably, Namibians generally assess their mother tongue in economic terms. Hence these are held in low esteem as they are not conducive to upward social mobility

From the foregoing discussion it can be seen that, among other things, the choice of English as sole official language, follows a colonial trend. Within Namibia there has never been planning, but merely reaction to events. Even today, there are no obvious language planners in the country and really no plans, only education policies. Thus Namibia has what Kaplan 1990 describes as a language-in-education policy, as opposed to a language plan. The decision to make English the main language has been made, and it is now up to the government, through the Ministry of Education, to implement it.

Concerning mother-tongue (MT) education for the school beginner, Fourie 1997 observes that its cognitive value cannot be obvious for most parents. It therefore ought to be a crucial aspect of the implementation phase that the government launch a campaign to make parents aware of the issue. Other issues of cultural transmission, African identity, and self perception ought to be raised as being necessary for in a proper language plan. On the whole, language policy within Namibia must conform to the spirit of the language provision in the Constitution, which calls for multilingualism.

From what Haacke 1994 reports to be the attitudes of the people towards their own languages, there are problems of implementation in the horizon. The need to articulate the place of ethnic languages is now apparent: as a response to what might be considered encroachment by the English language into domains that were historically exclusively MT domains, and to attempts by industry to determine employee profiles and requirements. Language planning in Namibia mirrors the observation that Das Gupta & Ferguson (1977:4) have made about planning in other countries:

> 'Language planning is a latecomer to the family of national development planning. Although deliberate attempts to change or preserve languages and their use may be as old as economic policy making efforts in human societies, ... it is only recently that these activities in the language area have been recognized as an aspect national planning which can be investigated with the same conceptual tools that are appropriate for general development planning.'

1.3 Contradiction in policy: Assimilationist or pluralist?

Before approaching the question of policy options, it is necessary to diverge for a moment in order to consider the contradiction in terms contained in the vague language policy. The contradiction between the identity function of language, its ability to express and evoke solidarity, and its power function are at the root of all ambivalent attitudes towards co-existing languages which have filled so many pages of sociolingusitic literature. For example, to understand the language behavior and attitudes of the Tunisian elite, as described by Stevens 1983, one need only ask the question: which of the three co-existing linguistic varieties fulfills the power function in the post-colonial context? Certainly not the Tunisian dialect of Arabic, nor Classical Arabic, even though the latter is considered to be a prestige language. French alone is associated with modernity, authority, and power. Through language policy (Stevens mentions that though education is bilingual, French takes up 70% of the curriculum by the end of the secondary school and more at the university), entry into the ranks of the elite is tightly controlled. Why does the Tunisian elite and that of other African countries consider their own MT to be inferior? Because it does not provide them with access to power, and since the main goal of an elite is to remain in power and to give their children the same chances, such an attitude is not very surprising. Thus there seems to be a belief that this inferiority is inherent and cannot be redressed (Bokamba & Tlou 1977).

In the whole history of language planning, not just in the third world, many a language policy that is assimilationist on the surface in fact serves to exclude sections of the community, to place them in a situation of permanent exploitation. It is very likely that the debate about language loyalty and identity will erupt in Namibia as increasing numbers of school children fail to graduate with proficiency in English. Fishman 1971 has noted how nationalism and a need for identity in the face of introduced languages in a community leads to protectionism and promotion of the authenticity of the local language.

On the basis of the preceding discussion concerning the ambiguous language functions in the Namibian policy, it becomes clear that linguistic identification with a sub-national collectivity is essentially the result of socio-economic and political pressures. However, when a society is split into two diametrically opposed classes, the rulers and the ruled, maintenance of linguistic differences becomes a signal that social cleavages exist. The more emphasis is placed on the power function of language, in the sense that the acquisition of a prestige variety is the prerequisite for economic success and political participation, the greater the gap between the two classes and the two linguistic varieties. Publications by Bagmbose 1991, Bokamba & Tlou 1977, Bokamba 1981, 1984, 1995, Tollefson 1991, and Phillipson 1992 have examined some of the broader issues relating to language, language planning, language dominance, and society. Whatever else they achieve, these publications draw attention to some of the less obvious and generally unintentioned roles of individuals involved in language planning. Given the reservations about language planning and English in sub-Saharan Africa, it would seem pertinent to address some of the more important issues these publications raise that have a bearing on this study, seeking as it does to analyze language planning in Namibia, and indirectly at least, the role of English.

The authorities named above suggest very strongly that the continued expansion of the English language might be to the disadvantage of those countries that are promoting its use. They question the link between development (= modernization) and English language teaching. Tollefson 1991 maintains that modernization and the English language have become inextricably linked, arguing that most developing countries equate one with the other. There is much truth in this concept as far as Namibia is concerned. English, as we have seen so far, is the sole official language. It is therefore the language of business, commerce, science, technology, and international relations, and these are precisely the reasons its use is promoted in the country. However, Tollefson (1991:82) argues that 'the central idea of modernization is that "underdeveloped" societies must break free of "traditional" structures that limit economic development and prosperity'. He goes on to argue that modernization is sometimes seen as being identical to 'Westernization' and that 'underdevelopment' can best be overcome by adopting institutions and patterns of behavior found in industrial societies. Tollefson's hypothesis suggests that in achieving development, a country must lose its identity. He cites countries such as China and Iran as examples. While it is not possible to verify this claim on the basis of more empirical studies, it seems that Namibia is headed in that direction in replacing ethnic-language curricula with an English

one. It is actively promoting English in its schools and seeking ways in which English might gain dominance instead of complementing the indigenous languages. Tollefson's contention therefore that 'monolingualism', preferably English, is seen as a practical advantage for modern social organization, while multilingualism is seen as a 'characteristic' of 'unmodernized', 'traditional' societies is true of Namibia, as borne out by Haacke's 1994 observations about language attitudes in Namibia.

Defenders of the position of English in the world (e.g., Jones, 1997) do not necessarily agree with such claims as Tollefson's and others. They argue that while inequality between nations and within nations is self-evident, to criticize the role of English in this equality suggests that language is at the root of the problem. English, they say, has certainly empowered some groups and individuals within countries and placed them in positions where they have been able to exploit their neighbors, however, they say, such inequality and the misuse of power would exist with or without English. However, this is still no argument to defend the continued colonial policies in most African countries characterized by 'pervasive multilingualism'. Bokamba (1995:19) states that:

> the biggest and the most important threat arising from the elevation of a particular language or group of languages as national/official languages over others is the perceived de-empowerment that such a language or languages accord to the speakers, especially L1 speakers. The selection of an official language for administration and education allocates two crucial speech domains to that language, thereby makes accessible employment and political opportunity to those citizens who command the language concerned. Specifically by serving as the language of instruction the official language(s) determine(s) a student's chances for academic success and upward mobility. Similarly, by functioning as the language of administration the official language(s) determine(s) language policy in the public as well as the private sector, including the judicial system, political programs, church-related services, and mass media. As such, it becomes a benefit for its speakers, but an obstacle to various opportunities for non-speakers.

This indeed has been the primary issue in the linguistic conflict in places like India in the 1950s and 1960s, and in Belgium and Canada in the last two decades. Therefore, what Bokamba is pointing out here is that language empowerment resulting from the anticipation and implementation of a language policy applies to any language, indigenous or non-indigenous. For this reason, Bokamba 1995 concludes that the solution does not lie in opting for a European language of wider communication (ELWC), because in the case of Africa, these have produced a distinct elite that receives most of the benefits, while the non-speakers of these languages have been and continue to be marginalized. Therefore the 'solution to language empowerment through a policy of exclusion is to adopt a calculated multilingual policy that allocates different functions to the selected languages and thereby allows a wider access to the resources and opportunities to the interested and capable citizens' (Bokamba 1995:20). Bokamba goes on to

say that this type of plan has been successfully implemented by India in its three-language formula, where Hindi is a national and official language; English is a co-official language, and 16 languages from the different regions are state languages. It can be seen therefore, that a multilingual policy such as this one, although not without problems, is designed to offer more opportunities for more people than a monolingual one.

1.4 Towards a Namibian language plan

In Namibia there ought to be growing awareness that language has to be taken into account in any national development plan. The dictates of trade, industry, commerce, and education recognize the role of English, but it is doubtful that those of culture, religion, and national unity will require a similar role of English. A problem arising from the development of language as a factor in national planning concerns the nature of language planning itself. Important questions about the role of languages in society and the impact they are likely to have need to be addressed. The question as to who should be asking the questions and organizing the planning is open to debate. Kaplan (1990:4) observes that language planning is

> an attempt by some organized body (most commonly, some level of government) to introduce systematic language change for some more of less clearly articulated purpose (commonly stated in altruistic terms but often not based on altruistic intents.

Kaplan's definition suggests self-interest as an important factor in language planning: planning by the elite for the elite. Cooper (1989:45), having considered twelve different definitions from earlier works, concludes that language planning 'refers to deliberate efforts to influence the behavior of others with respect to the acquisition, structure, or functional allocation of other language codes'

In the context of Namibia, Cooper's linguistic rather than Kaplan's politically influenced definition seems more plausible, but does not explain why language has to be planned. Kaplans's suggestion that planning is done by government to propagate its objectives seems to be particularly relevant to Namibia. However, it is the duty of any government to strive to make language plans meet the goals articulated in their constitutions. This can only be achieved through systematic planning of language. As currently understood, according to Christian 1988, language planning is characterized by an explicit and systematic effort to resolve perceived language problems and achieve related goals through institutionally organized intervention in the use and usage of languages. Also, language planning is future-oriented. It involves the consideration of the structure and function of the linguistic repertoires of a speech community or a nation and its socio-cultural and political setting, and envisages deliberate changes in the linguistic repertoires, keeping in view the future image of the society at large. Characterization of the present Namibian socio-linguistic situation, projection of the future image of society, and the scope of change will determine the nature, structure, and function of the the linguistic repertoires in the future. Therefore crucial in this process is who defines language problems; what language problems of the

the linguistic repertoires are perceived and projected; why certain language problems are characterized; what strategies and solutions are suggested to solve the problems, and so on. Several such questions need to be properly understood within a systematic framework of a sound theory of language planning. The consideration of goals, values, ideologies, and criteria provides such a framework and forms the basis for the existence and growth of multilingualism.

The setting of goals, their precise formulation, and the degree of consistency among them with regard to resources, social objectives, evaluation of alternatives, and instruments for achieving the goals constitute perhaps the most crucial and complex component of language planning. The discussion of goals themselves is incomplete without the consideration of various criteria that have been suggested or proposed in decision-making about issues related to language-status planning. This is not only because these criteria support different, conflicting goals, values, or ideologies, but also because they may be employed without any proper weighting toward achieving certain ends. For instance, Neustupny 1968 mentions four criteria: development, democratization, unity, and foreign relations. Skutnabb-Kangas & Phillipson 1986 offer a list of criteria consisting of: unity, accessibility, familiarity, feasibility, science and technology, pan-Africanism, wider communication, and United Nations, which have been suggested in the context of the choice of an official language for independent Namibia. They show how these criteria focus more on the international functions of the official language and less on the socio-cultural and educational factors as part of an overall multilingual policy. They point out that some criteria that would have been extremely relevant have been excluded from the list. These include: ease of learning, Namibian cultural authenticity, empowering the underprivileged, and self-reliance. They claim that the selective checklist of criteria is skewed in favor of English. Thus there is a gap between the ideal and reality.

In situations of language-status planning, the allocative decisions to use and develop certain languages have failed either because they were not realistically formulated in the first place, or because an adequate consensus could not be sustained in the process of their elaboration and implementation, or because the hidden constraints and socio-political consequences flowing from them were not fully grasped at the time the decisions were taken, hence the gap between the ideal and reality. This gap is not properly perceived because the relationship between policy and practice is characterized, as pointed out by Afolayan 1984, by the three-headed monster of underrating, overrating, and self-deception. Thus he finds a transparent skewness between the ideological position of indigenous languages of Nigeria and the status of the English language, and therefore requires a very clear, well-balanced policy on the English language as the nation's second language, such that the indigenous Nigerian languages would also play their most meaningful roles side by side. In short, the quality of language planning and consequently the future of multilingualism depend upon the nature and scope of decisions about the status and function of various languages in the domain of education. Language planning can play a constructive role in establishing meaningful interdependence between ethnic languages and English in Namibia on the ba-

sis of their educational, cultural, socio-political, and communicative roles rather than considering their functions in oppositional terms.

5. Conclusion and policy recommendation

A close look at the Namibian policy in education has revealed certain ambiguities, vagueness, and inconsistencies in its formulation, not unlike findings reported in the analysis of educational policies in most sub-Saharan African countries. First, a general vagueness is manifested in the policy. There are two different aspects to this vagueness: ambiguous agency regarding responsibility for actions, and lack of clear guidelines and explicit strategies. Second, the policy makes recommendations that misrepresent the current economic situation and are not coherent with available resources. For example there is still no provision for community language teaching, and the first languages of learners are neglected. Third, there is a contradiction in terms as to the nature of the policy. It is not clear if it is assimilationist or culturally pluralistic. However, the continuation of a colonial heritage, in which rulers maintain hegemonic relations with their subjects, is apparent from the policymaker's lack of inclusiveness. It may be what Haacke 1994 suggests, that perhaps the influence came from what was perceived as the trend in policy making, from watching other post-colonial African countries, and listening to international debates on education.

From the preceding discussion, we conclude that like many other African nations, Namibia faces the problem of choosing a national language as well as introducing several languages at the level of school education with an express view to preserve and promote multilingualism and multiculturalism, even at the level of formal education. As this paper has shown, prevalent in the discourse about African language policies is the idea that no policy should seek to eliminate the diversity of language repertoires within most African contexts. Bagmbose 1991, Bokamba 1981, Bokamba & Tlou 1977, Phillipson 1992, and Tollefson 1991, among many others, have emphasized the equal rights of all languages and suggest that all citizens have the right to political participation, education, and services in their own language. Furthermore, they insist that all members of a multilingual speech community have a right to the use of their language as a medium of instruction, as well as of the other official interactions mentioned above. The proposal offered by Bokamba & Tlou 1977 has a reality to it that is desirable for most African states. They propose that each sub-Saharan African state set up a language planning commission of linguists, educators, anthropologists, sociologists, economists, and political scientists to survey the relevant languages and make recommendations to the government concerning the selection of a single national language. On the basis of a statistical and attitudinal survey, the national language selected from the pool of the nation's *linguae francae* should be used as the medium of instruction. The remaining should be taught as compulsory subjects in the school system and used in certain other specified functions. In the case of Namibia, this includes Afrikaans, which enjoyed co-official status with English before independence, and German, which was used along with English and Afrikaans in the administration of Whites. The relevant international lan-

guage, English in the case of Namibia, should be introduced as a compulsory subject only from grade four onwards. Bokamba & Tlou (1977:47) maintain that if the initial work is carried out carefully, and the government cooperates, the kind of language policy that will emerge from such a plan 'will be comprehensive in that it will be based on the objective realities of the society concerned'.

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ERRATA
to Hartkemeyer, *Studies in the Linguistic Sciences* 28:1.221-34

The editors greatly regret that, through an unfortunate font-change, certain phonetic/phonological symbols were improperly reproduced in Dale Hartkemeyer's review article. Please make the following changes:

® > ə

p. 222, lines 10, 11, 14, 31

[Ò], /Ò/ > [ʎ], /ʎ/

p. 226, lines 1, 2, 28
p. 227, lines 18, 22, 26, 27, 43
p. 228, lines 1, 6, 11, 12, 13, 16, 18, 19, 20, 22, 25, 30, 34, 35, 36, 37, 38, 39, 43, 44
p. 229, lines 3, 26, 30, 43, 44
p. 230, line 16

/-c/, [-c] > /č/, [č]

p. 221, lines 11, 7, 6 fr. below
p. 226, lines 28, 32
p. 227, lines 18, 19, 26
p. 228, lines 6, 25, 45
p. 234, line 19

/-s/, [-s] > /š/, [š]

p. 225, lines 8,9, 11
p. 226, line 32

/©/, [©] > /ʒ/, [ʒ]

p. 227, line 27
p. 228, lines 13, 21, 23

[i] > [ɸ]

p. 228, lines 40, 43

/‡r/ > /r̃/

p. 230, lines 15, 24

/°n/ > /ŋn/

p. 232, line 7 from below

/ø/ > /ɔ/

p. 233, line 24

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REVIEW ARTICLE

Kenneth J. Wireback: *The Role of Phonological Structure in Sound Change from Latin to Spanish and Portuguese.* (American University Studies, Series II, Romance Languages & Literature, 215.) New York: Peter Lang, 1997. Pp. xii + 139. $33.95.

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As the title clearly discloses, the concern in this book is with an investigation into, and illustration of, the role played by phonological structure in the evolution from Latin of the two chief representatives of Hispano-Romance, Spanish and Portuguese. W's underlying premise throughout is that 'the role of phonological structure in sound change is primarily responsive rather than causative' (p. 6). In other words, the causes of diachronic sound shifts are to be sought and identified originally at the phonetic surface level, and shifts at the phonemic level and reorganization of the phonology (more specifically, 'the abstract underlying phonological representations that are stored in the lexicon plus the phonological rules that link the underlying representations to their surface phonetic form' pp. 6-7) constitute essentially subsequent responses to phonetic-level changes and altered relationships.

In this context, it may perhaps be useful to lay out here W's conception of sound change as a three-stage process (p. ix):

(1) '... a phonological rule is added to the system as a representation of consistent phonetic mutation in some direction.'

(2) '... this rule may be extended to new phonological environments and segments.'

(3) '... the rule may be lost with the subsequent restructuring of a phonological representation.'

For example, with regard to (1), the high palatal vowel /i/ often phonetically conditions affrication of a preceding /k/ > /-c/. When a listener is no longer able to perceive the context for this change, i.e., immediately before /i/, s/he will be unable to factor out the phonetic palatalization and arrive at the abstract, underlying /k/, and so, in assigning a lexical representation to the sound heard, will take the phonetic [-c] to be the phoneme /-c/ rather than the original /k/. In W's conception, this response of 'restructuring' /k/ to /-c/ simply stems from the speaker's perception of the surface output. In connection with (2) above, W maintains that the speaker's faulty perception, when acquiring a phonological rule, must be behind the extension (through generalization) of a rule to new inputs. This can occur when a speaker fails to pick up accurately on the original specific context, mistaking it for a more general environment. Finally, with reference to (3), when a

phonetically conditioned allophone of a segment in a particular environment is 'restructured' as an independent phoneme, it may subsequently become difficult or impossible for a listener to recover either the operation of the earlier rule conditioning the allophone, or that rule's input, in such a way that, for all intents and purposes, the rule has been lost, or in the terminology of Hock (1986), has undergone atrophy. But importantly, in all three stages of the sound change process, W regards the addition of or changes in the phonological rule as arising in reaction or response to a phonetic state of affairs already obtaining on the surface.

W cites an example, originally discussed in Hock (1986:266-7), of rule reordering in German, involving final devoicing and ®-loss. The earlier standard German rule ordering had final devoicing before (optional) ®-loss and so derived surface [ta:k] sg. nom. and [ta:g] sg. dat. from /tag/ and /tage/ respectively. However, a later development in German makes [ta:k] acceptable for many speakers as both the sg. nom. and dat. form. What this means is that for these speakers, ®-loss has been reordered before final devoicing. W draws on this example (pp. 2-3) to demonstrate his point that the structural changes in the phonology (here, the rule reordering which brings about the extension of the final devoicing rule to additional segments not before subject to it) 'are responses to perceived analogical relationships on the surface'. That is, German speakers have an abiding intuition that all final obstruents should be voiceless, and thus the surface sg. dat. [ta:g], even though it derives from underlying /tage/, should also conform to the final-obstruent devoicing. Thus, the extension of devoicing to forms showing a surface violation of a rule, in a movement which is quite evidently in the direction of enhancing rule transparency in surface forms, forces the reordering of the two rules. W is emphatic here that it is not some internal phonological structure motivation which occasions the rule reordering, and just coincidentally the subsequent extension of final devoicing to surface forms violating this rule. Thus, the increased surface regularity and the structure of the output appear to be what is really driving changes, not some internal and abstract phonological structure or principle. Again, in W's view the role of the latter is to respond to those changes arising on the phonetic surface (in the present example, by reordering ®-loss before final devoicing, so as to bring about greater surface regularity in the application of final devoicing, a rule of considerable perceptual salience for speakers of German).

In like fashion, W seriously questions a couple of other examples of accounts of diachronic changes (i.e.., appeals to the Obligatory Contour Principle and the notion of push chains) that are founded on what he considers the misguided notion, tempting though it is, of 'attribut[ing] causality to principles of structural organization' (p. 4). Attempts to make abstract phonological principles (such as the OCP, with its avoidance of adjacent identical segments on a melody tier, or the chain shift, viewed as a response to an impending phonemic merger), he claims, are uniformly fraught with the paradox of having to be at the same time sufficiently strong and sufficiently weak. In the case of diachronic accounts relying on the OCP (e.g., Schane 1989) and other such phonological principles, he observes that 'the principle in question must be weak enough to allow for exceptions to it, but strong enough to cause language change by attempting to elimi-

nate exceptions to it' (p. 5). According to the push-chain notion, the threat of merger and loss of phonological contrasts must be of such gravity that the response of the phonological system is a chain reaction among phonemes, and yet phonemic mergers are by no means rare occurrences. To rather striking effect, W wonders aloud: 'if push-chain theory is weak enough in terms of its inability to apply when merger does occur, then why in other cases is it employed to prevent merger at all costs?' (p. 6). The solution to the paradoxes posed, W maintains, is to recognize that constructs pertaining to the domain of the phonology (such as the OCP, push chains, rule ordering) are clearly not strong enough to block certain violations, and therefore are unlikely to be the prime movers, the chief causation, behind sound changes. Even while granting that 'principles of phonological organization' can nevertheless INFLUENCE sound change, W hastens to bring the reader back to his main thesis:

> phonological structure adapts to phonetic developments on the surface rather than constraining or blocking them due to purely phonemic principles of organization, perhaps because speaker awareness is attuned to the phonetic surface rather than the more abstract phonological level.

Thus, even though W, in essential agreement with Labov (1994), does acknowledge the possibility that 'teleological factors' like concern about avoiding phonemic-contrast neutralization may have some role to play in diachronic changes, he insists on the view that sound change *per se* is, in the main, mechanical, operating outside of and independently of some systemic preoccupation regarding the preservation of phonemic contrasts.

W recognizes the complexity of all linguistic change, including sound change, admitting frankly that any one theoretical focus cannot possibly hope to provide an all-encompassing picture of this complexity, but he offers us in the three central chapters of the book his examination, from the theoretical perspective outlined here, of three selected sound changes that developed in the transition from Latin to Spanish and Portuguese — (1) consonant + yod sequences and their various outcomes, (2) palatalization of /pl/, /kl/, and /fl/ clusters, and (3) evolution toward the 'strong word boundary' and 'strength pattern', and the so-called 'initial sonorant strengthening' — in the hope that his investigation, which is indeed noteworthy for its detail and thoroughness, may furnish scholars of diachronic Hispano-Romance with valuable new insights into some mechanics of sound change not previously highlighted, or insufficiently highlighted, in the literature.

In each of the three core chapters (2, 3, and 4), W presents a set of diachronic data for Spanish and Portuguese illustrative of the sound change under discussion and then proceeds to a detailed consideration of these data — rich in references to the work of previous researchers — from his perspective on sound change and the responsive-rather-than-causative role that 'phonological structure' plays within that process of sound change. Space here does not allow an elaborate report of many of the details presented; instead, I shall limit myself to

identifying a number of key points from each of the core chapters and attempt to show briefly how W argues for his theoretical perspective on the basis of his account of the data.

In chapter 2, 'The interaction of consonants and yod in Hispano-Romance: metathesis, epenthesis, and palatalization', W considers data of this sort:

CASEU	>	Sp. (caiso) > queso, Pg. queijo	'cheese'
AREA	>	Sp. (aira) > era, Pg. eira	'threshing floor'
NOVIU	>	Sp. novio, Pg. noivo	'boyfriend'
APIU	>	Sp. apio, Pg. aipo	'celery'
SAPIAT	>	Sp. (saipa >) sepa, Pg. saiba	(subj.) 's/he knows'

and one of his key conclusions drawn in support of his thesis is that even though such transpositions of the yod within the string (more frequent in Portuguese than in Spanish) most likely originated in Hispano-Romance sporadically in configurations of coronal C + yod through the misiming of individual features (e.g., BASIU > /basjo/ > /baʲsʲo/ > /bajso/ ... > Sp. *beso* 'kiss'; CORIU > /korjo/ > /koʲrʲo/ > /kojro/ Pg. *coiro* 'leather'), along the lines of previous analyses by Hock (1985, 1986) and Wanner (1989) with his notion of the 'supersegment', extension of a similar 'glide epenthesis' to additional lexical items nevertheless may well have proceeded more in the nature of a phonological process of segment insertion. W examines in detail the issue of how such a process that began on the phonetic surface as sporadic articulatory mistimings would have come to achieve its later phonological regularity, and he concludes again, in accord with his overall perspective, that it was a case of the phonology responding to and regularizing developments which were already occurring on the phonetic level. Appealing to particular feature-geometrical representations and explaining details of the palatalizations and glide transpositions evident in the above examples involving coronal Cs, in terms of leftward spreading of the Coronal articulator under the /s/ or /r/, and of spreading of the [+high] feature under the Dorsal node of the palatal glide (yod) onto the preceding V (yielding, e.g., [baʲsjo]), W suggests that there was an adjacency restriction on Coronal spreading in Hispano-Romance, meaning that labial + yod sequences like those in NOVIU, APIU, and SAPIAT did not undergo Coronal spreading (i.e., palatalization and glide epenthesis), since in W's feature-geometrical representations labials lack a Coronal articulator that could spread onto the preceding V. [It might be remarked here in passing that the approach suggested in more recent work like that of Browman & Goldstein (1991) in terms of articulatory gestures and their overlaps would seem to offer a more explanatory and promising conceptual fit for the phenomena under discussion here than the highly abstract feature-geometrical framework adopted by W] The leftward yod transpositions we note in items with labials, like Pg. *noivo, aipo,* and Sp./Pg. *sepa, saiba,* W therefore attributes not to feature spreading, but to straightforward 'structural metathesis', i.e., whole-segment inversion between the yod and the preceding labial consonant, so as to achieve what W believes was a prevailing preference in Hispano-Romance (stronger in Portuguese than in Spanish) for a (C)VG syllable shape over a (C)GV one (making, e.g., *ai.po* in Portuguese preferred over *a.pio*). A good portion of the chapter is devoted to moti-

vating and clarifying this distinction between the two types of yod transpositions.

W also hypothesizes that in the case of the evolution of the sequences /s:j/ (as in QUASSIARE > OSp. *quexar*, Pg. *queixar*) and /skj/ (as in FASCIA > Pg. *faixa*), we have instances of palatalization with subsequent anticipatory epenthesis of an off-glide. In other words, the postconsonantal yods in the original Latin forms were absorbed in the early palatalization process, and the yods that appear before the palatal /-s/ in the later Romance forms (mostly in Portuguese) arose by epenthesis in anticipation of the following palatal C (i.e., /s:j/, /skj/ > [-s] > [j-s]), a process most probably spurred along analogically by a number of already existing lexical items showing [j-s] which had derived from original Lat. /ks/ (e.g., MATAXA > OSp. (*madaixa* >) *madexa*, Pg. *madeixa* 'skein'; TAXO > OSp. (*taixo* >) *texo*, Pg. *teixo* 'yew').

W likewise addresses the question of just how the epentheses or metatheses evident in the data acquired regularity in early Hispano-Romance. In this regard he outlines two possible scenarios: 1) Through CG mistimings, a supersegment arises (e.g., /sj/ > [ʃ]), gradually being extended to new inputs throughout the lexicon, and over time speakers' perception plays a role in the regularization, as they begin to perceive the supersegment as a GC sequence in more and more of the lexical inputs containing it. Under this scenario, the regularization process of glide epenthesis would involve intermediate forms in all cases. Or, alternatively: 2) Quite early on, given its instability, the supersegment is perceived and reanalyzed as a GC sequence, even before the mistiming process and resulting supersegment status have had a chance to make their way through the lexicon to achieve regularity, and so the emergence of a clear GC sequence in a FEW lexical items may bring on a more sudden metathesis (rather than glide epenthesis) in other lexical items containing the relevant CG sequences. W speculates that both of these scenarios are likely to have been played out in the early days of the development of Romance languages, and he notes that evidence of lexical variation at early stages (e.g., CATENATU > *cadnado, candado, cannado [ñ], calnado*, examples from Wanner 1989 indicating a likely supersegment [^{d}n^{d}]) seems to suggest differing outcomes from a mistiming process, and presumably regularization at the supersegment stage. On the other hand, W considers that for C + yod sequences, an early reanalysis to GC sequences was probable, so that the inversion observed in labial + yod sequences was implemented via metathesis. Here again, W wants to stress that at its inception glide inversion was essentially a phonetic phenomenon, growing out of articulatory mistimings, but that over time the increasing frequency of and preference for a (C)VG syllable shape gave rise to purely phonological rules of complete-segment inversion, so that what started out as a sporadic phonetic phenomenon came to take on a certain phonological regularity, once the phonological system began to respond to the initial phonetic developments and extend a pattern.

In chapter 3, 'The development of the Latin and Romance obstruent + lateral clusters from Latin to Spanish and Portuguese', W examines Spanish and Portuguese data involving the palatalization of ROMANCE clusters like those in:

OC'LU	>	OSp. o[Ò]o, Pg. olho	'eye'
COAG'LU	>	OSp. cua[Ò]o, Pg. coalho	'curds'
CONCH'LA	>	Sp./Pg. concha	'shell'
UNG'LA	>	Sp. uña, Pg. unha	'fingernail'

as well as of the similar LATIN clusters like those in:

CLAVE	>	Sp. llave, Pg. chave	'key'
PLORARE	>	Sp. llorar, Pg. chorar	'to cry'
FLAMMA	>	Sp. llama, Pg. chama	'flame'
AMPLU	>	Sp./Pg. ancho	'wide'
INFLARE	>	Sp. hinchar, Pg. inchar	'to swell'

and cases of Latin clusters in which palatalization has apparently failed to occur, as in:

CLAVU	>	Sp. clavo, Pg. cravo	'nail'
PLATEA	>	Sp. plaza, Pg. praça	'town square'
FLORE	>	Sp./Pg. flor	'flower'

Surveying broadly the Romance data, both Eastern and Western, regarding the fate of these obstruent + lateral clusters, W finds that Italian shows regular palatalization of all such clusters (both Romance and Latin), Rumanian shows palatalization only of velar clusters (both Romance and Latin), Spanish and Portuguese show regular palatalization of the Romance clusters and irregular (i.e., not universal or consistent) palatalization of the Latin voiceless-obstruent clusters, whereas Gallo-Romance dialects like French and Catalan show palatalization only of intervocalic Romance clusters. These comparisons lead him to pose a few interesting questions which turn out to have rather complicated answers, regarding the relative irregularity of the palatalization sound change in Hispano-Romance, when compared with its highly regular outcome observed in Italian; the importance of the cluster's position in the word in determining its outcome in Hispano-Romance (e.g., in Spanish we get /Ò/ word-initially (*llamar*) and /-c/ word-medially (*hinchar*), but in Portuguese there is no positional differentiation in the outcomes: *chamar, inchar*); and the factor of obstruent voicing in the sound change. [It should be noted here that in Old Portuguese the digraph *ch* indicated the sound [-c], but the phoneme has since been deaffricated to [-s].]

In considering the numerous exceptions to cluster palatalization (like *clavo/cravo, flor*, etc.) that we find in Hispano-Romance, W cites a number of factors identified by previous scholars as possible explanations for the irregularity, such as learned influence, position of primary stress in the word, avoidance of the threat of homonymic clash (e.g., CLAVE > *llave, chave* vs. CLAVU > *clavo. cravo*) or phonetic clash, whereby palatalization of the cluster is blocked when two palatal Cs within a single word would result (e.g., PLANGERE > Sp. *plañir*, not **llañir*), and the development of doublets like *plegar : llegar* in response to a perceived need to resolve cases of polysemy. W is particularly struck by the contrast in the palatalization developments observed between Italian and Hispano-Romance, and he expresses curiosity as to why none of these various fac-

tors operated to mar the regularity of the sound change in Italian. What was different, he wonders, about the spread and evolution of the sound change in the Iberian Peninsula that caused these various factors to interfere so powerfully with the regular extension of palatalization to all the possible contexts that might have undergone the process? He expounds and considers some competing views from the literature on the nature of the spread of the palatalization change, dismissing hypotheses claiming that it actually was regular early on, but that its effects then became masked in many cases by later restoration of the original clusters, perhaps under Gallo-Romance influence, and he decides instead to explore the other possibility, viz. that 'palatalization of the primary Latin clusters never reached full regularity in those Gallo- and Hispano-Romance varieties that show preservation of the original, unpalatalized cluster' (p. 90, fn 4).

Given this premise, he sets out as his goals for the chapter to determine what aspect of the palatalization rule made for its differences in rate of diffusion across the lexicons in Spanish/Portuguese vs. Italian, a condition presumably working along with the language-specific factors cited above (avoidance of homonymic clash, etc.); and the clarification of the differing outcomes, depending on word position and phonetic environment, of the original clusters in Sp. (/Ò/ and /-c/) and in Pg. (/-c/ only). W assumes that throughout Romania the first step in the evolution of the obstruent + lateral clusters was the palatalization of the lateral, so that in the case of Hispano-Romance, there was an early stage at which the clusters were /pÒ/, /fÒ/, /kÒ/. W rejects some previous analyses of Hispano-Romance that have given a fundamentally differing treatment respectively to Latin clusters like *kl, pl, fl* vs. the Romance clusters *k'l, g'l* (resulting from syncope, often of diminutives), motivated by the different reflexes of each type of cluster: e.g., in Spanish for Latin clusters: /Ò/ word-initially and /-c/ medially; for Romance clusters (which were by definition medial): /Ò/ intervocalically, later > /©/ in Old Spanish.

One line of analysis of the Romance clusters has attempted to regard their development as parallel to that of Lat. /kt/ and /ks/ sequences, involving weakening and vocalization of coda velars to yod, often with subsequent palatalization of the following C (e.g., AXE [ak.se] > *[ajse] > Sp. *eje,* Pg. *eixo*). This line of analysis, as W very rightly points out, relies for its success on the questionable assumption of a cross-linguistically unmotivated syllable structure like *oc.lu* (< OCULU). There is indeed no good reason why the /k/ or /g/ of such clusters should not have been recruited automatically into the onset of the following syllable, given that /kl/ and /gl/, unlike /kt/ and /ks/, were perfectly acceptable onsets in Latin. The key to a unified account for the differing outcomes of Romance and Latin clusters by the same mechanisms, he believes, is the phenomenon of obstruent lenition and the recognition that word-initial position came to be regarded as predominantly strong (i.e., immune to the kind of lenition found in medial, intervocalic positions). Thus, after the palatalization of the lateral in both the Romance and the Latin clusters, there was what he terms a 'heavy onset cluster' (e.g., [kÒ]), simplification of which was a natural tendency; it is here that lenition played a crucial role. In weak (medial, intervocalic) contexts, /k/ weakened to /g/ thus merging with original /g/, then spirantized to /ɣ/ and was eventually lost alto-

gether (thus, /k'l, kl/ > /kò/ > /gò/ >/ɣò/ > /ò/). By contrast, in strong contexts (word-initially or postconsonantally) the left word boundary or the preceding C served to support the obstruent, so simplification of the cluster would be expected to proceed via weakening of the palatal lateral, which became delateralized to the glide /j/, with subsequent fusion of the glide with the obstruent to yield /-c/ (thus in the strong context, /k'l, kl/ > /kò/ > /kj/ > /-c/). Portuguese, W claims, illustrates these two different contextually-conditioned lines of development precisely: OC'LU > *olho*, CLAVE > *chave*, and CONCH'LA > *concha*.

Castilian, however, poses a difficulty for a unified approach to the palatalization of both Lat. /kl/, /pl/, /fl/ and Rom. /k'l/, /g'l/, for there we find different outcomes for these two types of clusters: the former proceed to /ò/ and remain there (CLAVE > *llave*), while the latter also proceed to /ò/ but then go further by assibilation to OSp. /©/ (OVIC'LA > **ove[ò]a* > *ove[©]a*). W contends that obstruent lenition can again account for the outcome difference here. Since the Romance clusters were always word-medial, lenition applied much more regularly to their obstruents, quickly eroding them down to /ò/. However, the word-initial Latin clusters, because they were in strong contexts, were unable to lenite so quickly to /ò/. In the meantime, once the medial Romance clusters had lenited to /ò/, they soon diverged from the Latin clusters and merged with the /ò/ deriving from earlier /lj/ (e.g., foòa < folja < FOLIA), undergoing delateralization and assibilation to /©/, while the original word-initial Latin clusters still remained at the heavy-cluster stage, unable to follow directly the medial /ò/ (from the Romance clusters) on its way to /©/.

This approach, however, poses another question for W, i.e., why in Spanish do we find the word-initial Latin clusters resulting in /ò/, rather than the fortis /-c/, as we find in Portuguese and as we would really expect to find, in W's view, given that word-initial position is a strong one that tends to preserve obstruent articulations. He is committed to the strength-pattern analysis (as becomes abundantly clear in chapter 4) and believes that it warrants acceptance, even though this necessitates a further explanation for the anomalous Castilian word-initial /ò/, which he then proceeds to offer, drawing largely on the analysis in Torreblanca (1990). On the basis of the unidirectionality of certain 13th-century scribal errors, he concludes that the scenario for the development of the word-initial Latin clusters was roughly along the following lines. First, in the cluster /kò/ the velar obstruent palatalized in contact with the following /ò/ causing a more forward articulation of the velar, *[tò] (along the lines of the generally assumed development of /kj/ > /tj/), but since *[tò] was a difficult cluster articulatorily, it continued further to the even more fronted articulation [pò]. At this stage, there would have been just two remaining reflexes of the three original clusters: /pò/ and /fò/. After the weakening process /p/ > [ï] > [h] > ∅ posited by Torreblanca for these clusters (which runs in part quite parallel to that involved in the eventual loss of word-initial /f/ in Castilian), there is a merger of the two reflexes of the earlier clusters, and then aspiration, and eventual loss of the earlier obstruent: [ïò] > [hò] > [ò]. This, then, is W's answer to the question of why Spanish opted for /ò/ instead of the fortis /-c/ word-initially. As he explains it (p. 78),

> Thus, the weakening of /f/ as an aspiration rule played a central role in the loss of the obstruent in the initial clusters in Spanish, as it effectively ties initial /pÒ/ and /fÒ/ into a weakening process that in Iberian terms is strictly a Spanish (Castilian) phenomenon.

W proposes that the palatalization of the obstruent + lateral clusters began with the intervocalic Romance clusters *k'l, g'l*, and then the rule was gradually extended in certain speech areas to more contexts (Gallo-Romance, exceptionally, failing to extend it at all). Italian extended the rule with the greatest regularity, so that obstruent + lateral clusters, voiceless and voiced, in all environments eventually underwent the rule. W hypothesizes that something, however, arose in the development of Hispano-Romance which occasioned the less regular application of palatalization.

As a preliminary to getting at what this factor might be, W first reviews the distinction between two types of sound change elucidated in Labov (1981): so-called 'Neogrammarian-style changes' and diffusing changes. The former are characterized by phonetic conditioning, absence of lexical exceptions, and unawareness on the part of speakers that the change is underway; the latter are characterized by lexical exceptions and a high degree of lexical variation, as well as awareness of the change and observability by speakers. W is convinced that cluster palatalization in Hisp.-Romance began as a Neogrammarian change but then, as a result of some development, shifted into a diffusing mode of propagation. What was this factor, this development that spelled the end of the Neogrammarian stage of the sound change and opened the way to the less regular, diffusing phase of rule extension? Essentially, it was the relatively quick voicing, lenition, and loss of the obstruent in the intervocalic /k'l/, /g'l/ clusters, leading to the restructuring of these clusters as /Ò/, vs. the quite different outcome for postconsonantal /k'l/, /g'l/ clusters, where the onset obstruent was more protected from lenition, and thus preserved longer. After the intervocalic Romance clusters had undergone palatalization and the reflexes had been restructured to /Ò/, the rule had little input left, leading to rule atrophy (as per Hock 1986). It was at this point, W believes, that cluster palatalization ceased to be strictly rule-governed and became a diffusing type of change. He discusses in considerable detail how the original conditions on the rule, including stress position, became reinterpreted and more generalized during this diffusing, lexically irregular phase of 'rule extension' when palatalization came to affect now the Latin clusters. It is here too that those factors mentioned earlier, such as homonymic clash avoidance, etc., came to enjoy a certain influence, since now that speakers were quite openly aware and observant of the diffusing change underway, these factors that presuppose conscious efforts on the part of speakers could come into full play to impede the diffusion of palatalized variants.

This chapter ties in with W's overriding main thesis regarding the role of phonological structure, in the sense that the phonological developments involving the intervocalic Romance clusters (the split-off of /Ò/ and the restructuring of the remaining postconsonantal reflexes as /CkÒ/, /CgÒ/) brought about a state of affairs which interrupted what had been a Neogrammarian type of sound change

and opened the way for other 'conscious' factors like homonymic clash avoidance, polysemy resolution, etc. to interfere with the regular extension of the palatalization rule to new contexts, unlike the situation of highly regular rule extension we find in Italian.

In chapter 4, 'Lenition and the strong word boundary in Hispano-Romance', W introduces the topic by noting that the lenition observed in Spanish and Portuguese encompasses four distinct processes (viz. degemination, voicing of voiceless obstruents, spirantization of simple voiced obstruents, and deletion, usually of the voiced spirants [β], [∂], [γ]) and that the lenition of intervocalic word-medial obstruents, simple and geminate, set up in the Iberian speech area a strength pattern, according to which word-initial position is regarded as 'strong' (i.e., obstruents there do not weaken), and medial, intervocalic position is 'weak' (i.e., lenition takes place there); furthermore, this strength pattern then plays some kind of role in the development of sonorant strengthening, so that throughout Hispano-Romance word-initial /r/ > /‡r/; in Catalan, Aragonese, and Leonese word-initial /l/ > /Ò/; and in Leonese word-initial /n/ > /ñ/.

W goes on then to identify two ways in which the relationship linking the strength pattern, voicing, and medial geminates is problematic: (1) Although in modern Spanish and Portuguese word-initial /p,t,k/ are consistently unvoiced, the general assumption among scholars is that at an early stage of Hispano-Romance, these initial Cs also were subject to lenition when they were intervocalic due to a preceding V-final word; thus, UNUM TEMPUS would have given *un tempos* pronounced [un#tɛmpos], whereas ILLA TERRA > *la terra* would have been [la#dɛ‡ra]. The problem with this analysis, W points out, is that in allowing for a stage at which voicing of word-initial /p,t,k/ occurred as regularly as it did in word-medial (weak) position, we run counter to the notion of a developing strength pattern: speakers could not become aware of the 'strength' of word-initial position if lenition occurred there as well as word-medially. Thus, W argues, there had to be a stage when the allophonic voicing of the word-medial obstruents was NOT operating in tandem with a voicing of obstruents word-initially. (2) The other problematic issue is how to explain just how the obstruent strength pattern became extended to the sonorants /r,l,n/, since with obstruents the pattern developed in terms of a contrast in [voice] (voiceless word-initially, voiced word-medially), but for sonorants both the strong and weak variants are voiced. Surely the development of strengthened variants of the sonorants out of earlier Latin intervocalic geminates like *-rr, -ll-, -nn-* had a role to play in the actual form that the strengthened word-initial sonorants would eventually take, but there is another fundamental difficulty in trying to unify the strength patterns of obstruents and sonorants, for with the obstruents there was only a weakening word-medially and no actual strengthening, while for sonorants there was only a strengthening word-initially and no actual weakening in any position. Nonetheless, W feels intuitively that there must be a real and identifiable connection between the two different strength patterns in Hispano-Romance. The attempt at a resolution, then, of these several core issues constitutes W's aim here and the gist of this chapter.

The author describes certain modern-day Italian and Rhaeto-Romance dialects which have the lenition-type voicing of obstruents in word-initial position and considers in detail the various possible scenarios regarding the development/disappearance of this kind of lenition process throughout Romania, and the reasons for such. Drawing on work by Walsh (1991), he concludes that the rule voicing /p,t,k/ word-medially was most probably lost in Hispano-Romance (perhaps through the phonologization of the word-medial voiced allophones) before it had a chance to become extended widely, if at all, in word-initial position. This way, as W explains (p. 112),

> the obstruent strength pattern could survive intact from the beginning of voicing in medial position until the reassignment of the voiced allophones of /p,t,k/ to /b,d,g/, and it was during this period that the pattern was extended to the sonorants.

In trying to come to an understanding of how the strength pattern that arose from the obstruents came to apply to sonorants, a development motivated presumably by the aim of establishing a more general pattern symmetry within the grammar, as Hock (1986) proposes, W takes up a suggestion by Hall (1964) to the effect that Western Romance may at one stage have shared with Italo-Romance the process called syntactic doubling (s.d.), involving both obstruents and sonorants (e.g., *ad padre* [ap#padre] 'to father', *et rabia* [er#rabja] 'and anger'). W notes, however, that Hall reported that he estimated the frequency of s.d. at only about 19% and therefore dismissed it as insufficient to lead to the generalization of the strengthened forms *rr-, ll-, nn-* to word-initial cases in Hispano-Romance. W, however, believes there is a way to salvage this approach, which he considers quite promising, in effect by taking into account what might have been a higher PERCEIVED frequency of s.d. in early Hispano-Romance. One way this might have operated, he claims, relates to the identification of word-initial voiceless and word-medial geminate obstruents; after medial single /p,t,k/ had voiced to [b,d,g], initial /p,t,k/ and medial /pp,tt,kk/ were both left bearing the feature [-voice]. There must have been a stage, he argues, when postvocalic word-initial [p,t,k] as well as initial doubled [pp,tt,kk] (from cases like [ap#padre]) were both regarded as strong (exponents of strength being length and lack of voicing); in this way strong initial /p,t,k/ may have come to be perceived as long, even in postvocalic contexts like [meo#padre], thus enhancing the perceptual frequency of the phenomenon. A parallel development of doubling is proposed for the sonorants: through analogy with the strong obstruents, sequences like *mea rabia* may have come to be pronounced as [mear#rabja]. W summarizes his proposal in these terms (p. 118):

> Thus, the strong word boundary, defined for the obstruents primarily according to [voice] and secondarily by syntactic doubling, could have been extended to postvocalic word-initial sonorants as lengthening, especially since voicing would not have been extended because the sonorants were already voiced.

Given W's proposal, one might be prompted to inquire into the feasibility of the chronology here; for example, how early is the stage of s.d. conceived to be, and would function words like Lat. *ad* and *et* still be C-final, to induce the doubling, at that stage?

Another way W explains for enhancing the frequency of word-initial /rr, ll, nn/ is related to the fact that /r/, /l/, and /n/ were permissible word-final Cs in Hispano-Romance, so cases like /r#r/ could easily arise across word boundaries (e.g., OSp. *fablar raudo* 'to speak rapidly'). Cases like this involving /r/ would be particularly common, he claims, given that infinitives end in /-r/. Again, it would be well here to consider the chronological stage at which this s.d. process is envisioned; it is more likely that at the presumably early stage when it might have occurred, infinitives had not yet undergone apocope and so would more likely still have ended in /-are, -ere, -ire/. In sum, W holds that these and other lexical items with word-final /r/ could have given s.d. 'the support it needed to achieve generalization to all word-initial /r/ phonemes', and he notes that if the obstruent strength pattern really did play a key role in the phenomenon of sonorant strengthening, /r/ undoubtedly was the first of the sonorants affected by this pattern extension, since it is the one sonorant that has been universally strengthened in Hispano-Romance. Although he admits the possibility that /l/ and /n/ may have become strengthened — in those languages/dialects that show strengthened variants — directly through adoption of the obstruent pattern, he regards it as more likely that word-initial variants like those in, say, Cat. *lluna* 'moon' or Leonese *ñadar* 'to swim', arose through analogy with the strengthened initial /r/.

The material in this chapter relates to W's thesis that phonological changes arise in response to surface phonetic variations, particularly in regard to his claim that the strength pattern had to arise at a stage during which allophonic voicing of medial /p,t,k/ was occurring without the simultaneous voicing of these obstruents in word-initial position. The phonological obstruent strength pattern thus arose out of the PERCEPTION of the surface allophonic voicing variations that speakers noted in the two different contexts; and then later on, it was the PERCEIVED length of word-initial obstruents in postvocalic contexts (and on that pattern, of word-initial sonorants as well) that played a key role, in W's conception, in the establishment of the phonological pattern of sonorant strengthening.

In general, the exposition throughout is clear and organized, and the text reads well. There are, however, a few points at which minor lapses might momentarily stymie the reader or evoke some reasonable doubt. On p. 17 in the context of discussion of Latin forms like LIGNA, SIGNA, W describes the nasal as being preceded by 'a velar.../g/'. There is, of course, some doubt that the Latin orthographic sequence GN should be taken at face value; an alternate reading /ᵑn/ has been proposed (cf. Lloyd 1984: 244). On p. 34 in his discussion of intrusive stops in Eng. words like *rinse* [rInts] and *warmth* [warmpθ], W describes the intrusive oral stop [t] in *rinse* as 'homorganic with the following fricative'. How then does one explain the labial [p] preceding the interdental [θ] in *warmth*? Rather it appears that the excrescent stops in these cases are homorganic with the preceding nasals. On p. 66 W gives the derivation PLAGA > Sp. *playa* 'beach' and on p. 67

PLAGA > Pg. *praia*, whereas on p. 60 he provides the derivation PLAGIA > It. *spiaggia* 'beach'. Despite the fact that both Lloyd (1984) and Williams (1962) give Lat. PLAGA as the source for the Hispano-Romance words for 'beach', I would rather favor the form PLAGIA, as Penny (1991: 70) gives, since the phonetic developments into the daughter languages are then much more straightforward, and the inconsistency with the derivation of the Italian form given is thus eliminated. On p. 68 W provides the derivation FLAGRARE > Pg. *cheirar* 'to smell'. A brief note here to explain the, at first sight, baffling developments involving the cluster liquids in this and the word FLAGRANTE (also on this page) would help to orient the reader better: V.L. FLAGRARE derives from earlier C.L. FRAGRARE by liquid dissimilation; later, the Portuguese-specific rhotacism process applies to V.L. FLAGRANTE > *fragrante*, thus bringing this reflex full-circle back to its original C.L. /fr/-shape. On p. 80 Ital. *maschio* is incorrectly glossed as 'skull' rather than 'male'. This appears to be merely a word-processing mixup of some sort, since the Italian word for 'skull' is *teschio*, a form illustrating the same Italian cluster which is under discussion in the passage. On p. 100 in the data set toward the middle of the page, the last two Latin examples RIVU and CANTAVI seem not really to belong in the grouping since they do not illustrate spirantization of original voiced occlusives. Finally, underlining or otherwise highlighting the segment/cluster of interest in the data lists would help in better focusing the reader's attention on the particular phonemes exemplifying the sound changes under discussion in the various passages.

A few sporadic errata were noted (p. 36, bottom of page: text should read 'replaces the [+low] of the low-mid /ɛ/', not /ø/, as the text has; p. 38, last line, par. 2: 'complete', not 'compete'; p. 103, middle of page: upper case for LUPU; p. 103: should the a# in [a#bégora] properly be la#?), but for the most part, the print and the overall text is clean and easy to read.

An important strength of this book, a work fairly short in terms of pages, though conceptually replete, lies in identifying and treating in depth and detail, with copious references to the work of other important Romance linguists, three select and specific, but complex and thought-provoking issues in Spanish and Portuguese diachronic phonology. In a sense, the work serves as a concentrated and valuable survey of the literature on these three issues. Throughout, the author shows a knack for asking good, probing questions and then implementing his investigation well by systematically laying out the various possibilities, scenarios, and hypotheses involved in the different lines of his search, carrying on a fascinating dialog with the many other researchers he cites in his work, and examining carefully the strengths and weaknesses of the various possible approaches to the issues under discussion, in terms of the supporting evidence available.

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STUDIES IN THE LINGUISTIC SCIENCES

Papers from the Symposium:
'The Linguistic Sciences in a Changing Context'

EDITORS

Jerry Morgan
Elmer H. Antonsen

and

Papers in General Linguistics

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(FALL 1998)

DEPARTMENT OF LINGUISTICS
UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

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PAPERS FROM THE SYMPOSIUM: 'THE LINGUISTIC SCIENCES IN A CHANGING CONTEXT'

Edited by

Jerry L. Morgan & Elmer H. Antonsen

PAPERS IN GENERAL LINGUISTICS

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Papers from the Symposium:

'The Linguistic Sciences in a Changing Context'

30-31 October 1998

University of Illinois at Urbana-Champaign

A symposium in the
Center for Advanced Study Series:

'Territories & Boundaries:
Cross-Disciplinary Research and Curriculum'

EDITORS

Jerry L. Morgan

&

Elmer H. Antonsen

PREFACE

It was during the academic year 1997-98 that the Center for Advanced Study at the University of Illinois, Urbana-Champaign, initiated an ongoing seminar series for exploration of 'Territories and Boundaries: Cross-Disciplinary Research and Curriculum'. The focus of this series is on selected theoretical, methodological, and curriculum-related aspects of cross-disciplinary research. As part of the semester-long seminars in which students and faculty participate, the Center also organizes thematic symposia related to the topic of the seminars. The inaugural symposium, devoted to 'The Linguistic Sciences in a Changing Context', was held on October 30 and 31, 1998, in the University's Levis Faculty Center. This symposium brought together several department chairs and others in Linguistics and related disciplines, primarily from the Midwest, with the goal of furthering discussion of future directions which the field of linguistics should take in order to stay current and relevant in a broader, challenging academic context.

That the linguistic sciences should be the first choice for this series need not be emphasized here. It is generally recognized that language — and language-related issues — touch us all internationally as professionals, as social activists, and as members of the larger society. That decision, therefore, was easy to make. What was, however, difficult—and agonizing— to determine was the list of possible participants in the symposium: Which school of linguistics? Which subfields? Which paradigms? How many?

As we know, no two linguists agree on these points. What we finally did was to apply a zoologist colleague's response to the celebrated British phonetician Daniel Jones. When asked how a zoologist would define a dog, Jones was told that 'A dog is a four-footed mammal recognized as a dog by another dog.' The DOGNESS, however, forms a cline, and each breed of dog has shared characteristics. That is what distinguishes one breed from another. Daniel Jones, I am told, liked this definition and used to define other phoneticians by this standard. If it was good for the venerable Jones, I believe, it is good for us.

In selecting the program and participants, we may not have been able to be all-encompassing, but let me assure you that the committee (Jerry Morgan, Chair, Adele Goldberg, Braj B. Kachru) had a somewhat complex task and we did our best within our resources and time-frame. The symposium was broadly structured around four themes:

1. Current status and direction
2. Crossing borders: Exploring links with other disciplines
3. Curriculum design
4. Endangered world languages, linguistic curriculum and professional responsibility

Additional topics which were not formally included in the program were not excluded and were insightfully discussed during the meetings.

One major motivation for this symposium was to initiate a forum for the exchange of ideas and proposals, and to discuss various perspectives for the direction of the profession in the coming decades. One criticism that our profession faces is that we do not generally engage in self-evaluation, as do sister disciplines, such as anthropology, sociology, and psychology, and, indeed, most of the hard sciences.

Linguists have an eagle-eye for minute dissection, analysis, and interpretation of language data. But critics outside the profession — and many within the profession as well — express frustration that the linguistics profession in general tends to follow an ostrich-like attitude about the social responsibilities of their discipline and the design of the curriculum. One wonders with Bolinger whether linguists tend to function essentially as 'social sideliners'. The major concerns are about RESPONSIBILITY of the profession, and RELEVANCE of the curriculum and its flexibility —for both national and international students.

It was over a generation ago, in 1964, during the peak of the Structuralist phase in linguistics, that six architects of the discipline in the USA conceded in the *Report of the Commission on the Humanities* submitted to the American Council of the Learned Societies that 'a fair portion of highly educated laymen see in linguistics the great enemy of all they hold dear'. These six gurus, Charles Ferguson, Morris Halle, Eric Hemp, Archibald Hill, Thomas Sebeok, and William Moulton, have in one role or another been our teachers. And now, one might ask: after more than three decades has the situation changed? Has linguistics in a serious sense impacted language-related fields? Perhaps not. In 1980, Bolinger lamented that:

> In language there are no licensed practitioners but the woods are full of midwives, herbalists, colonic irrigationists, bone setters and general purpose witch doctors — some abysmally ignorant, others with a rich fund of practical knowledge — whom one shall lump together and call SHAMANS. (Dwight L. Bolinger. 1980. *Language: The Loaded Weapon: The Use and Abuse of Language Today*, p. 1. London: Longman,)

These are sobering words from a very sober linguist of our times.

In recent years a significant number of young linguistics graduates are absorbed in the departments of English — both language and literature — nationally and internationally. And more specifically, they are employed in what the Australian lexicographer Susan Butler has called the 'ELT Empire'. This enterprise is not restricted to the USA or the UK but is present in most of resurgent Asia and Africa. It was for this reason, and for strengthening interdisciplinary foundations with this fast emerging field, that Robert King of the Department of Linguistics at Texas made a plea, not too long ago, that linguists establish strong links with this swiftly expanding field. King's suggestion was not motivated exclusively for crossing over to greener pastures of this emerging international field. There were serious interdisciplinary academic arguments, too. And, of course,

there are many other fields in which the linguistic sciences are relevant. The 'ELT Empire' is just one example. This volume discusses some of these fields in detail.

At the University of Illinois, at the first retreat of the faculty of the department — just two years ago — Jerry Morgan raised the issues of relevance, interdisciplinary collaboration, and evaluation of the linguistic curriculum. Morgan's concern was one reason that contributed to the idea and design of this symposium. The Center for Advanced Study is grateful to Jerry Morgan and Adele Goldberg for their collaboration and active interest in organizing this symposium.

This step — no doubt a modest step — will perhaps initiate more deliberations on this vital topic here at Illinois and elsewhere. Perhaps at the 1999 Linguistic Institute of the Linguistic Society of America we can meet again on this campus. At that Institute a larger international group of scholars will be present here with a variety of perspectives and varied experiences in the USA and elsewhere.

My gratitude, appreciation and thanks for the success of the symposium are particularly due to the following: to Elmer H. Antonsen, Editor of the *Studies in the Linguistic Sciences (SLS)*, for devoting an issue of the *SLS* to this symposium, and for editing the final version of the papers presented at the symposium: to Jesse G. Delia, Dean, College of Liberal Arts and Sciences, University of Illinois, and to the Department of Linguistics for their support; to H. Jeanie Taylor, Associate Director of the Center for Advanced Study for coordinating the seminar and bringing this excellent group of scholars together, and to Liesel Wildhagen, Jackie R. Jenkins, Nancy Sarabi and Duane Swenson of the Center for doing one-hundred-and-one things with their usual efficiency and dedication for making this symposium on 'The Linguistic Sciences in a Changing Context' a memorable academic — and social — event .

Braj B. Kachru
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FOREWORD

Most departments of linguistics in North America were founded after the initial rush of enthusiasm for linguistics generated by the sudden emergence in the early 1960's of generative linguistics, and it is likely that most departments are still organized around the view of the 60's and 70's of linguistics and its role in intellectual life. But a lot has changed since those heady days, not just in linguistics and its influence on other fields, but in American academia in general. The aim of our symposium was to take a look at where we are now by bringing together linguists and scholars in related fields for an exchange of views on the changing role of linguistics in the intellectual world, in academe, and in society; to discuss its current status, future directions, its relations to neighboring fields, its role in the education of non-linguists. The selection of speakers included active scholars both from linguistics and from other fields, and several linguists who are, or have been, involved in planning in departments of linguistics. Our hope was that the result would be useful to the field at large, in planning for the coming decades. This hope is realized in the papers presented in this volume.

The topic of endangered languages was included as one of the few areas where linguistic research can have very direct social relevance. Both of our papers on this topic, by Paul Newman and by Salikoko Mufwene, take a pessimistic view of the current state of affairs in work by linguists on endangered languages. Newman argues that in spite of the lip-service given to the problem by individual linguists and by the profession, it is unlikely that much will be done to build a scientific record of dying languages. Mufwene argues that linguists are ill-prepared by their training to offer solutions for problems of endangerment. Both papers implicitly and explicitly suggest directions for improvement.

Several papers touch on the relation of linguistics to other disciplines. William Davies discusses ways to strengthen existing cross-disciplinary ties. Molly Mack's much-expanded paper provides a useful survey of issues in the neurosciences, focussing on potential areas of interaction between neuroscience and linguistics. Lise Menn discusses the nuts-and-bolts issues of interdisciplinary research, based on her own experiences in the Institute for Cognitive Science at the University of Colorado at Boulder. Donna Christian discusses the interdisciplinary nature of applied linguistics, suggesting that training of students in linguistics should equip them to work in applied domains.

Two papers, one by Steve Levinson and the other by Daniel Jurafsky, discuss the growing role of computation in linguistics; Jurafsky with a perspective from within linguistics, Levinson from the viewpoint of an engineer. Levinson calls for more collaboration between engineers and linguists in research on natural language processing by computers, and suggests the roles each field might play in successful collaboration. Jurafsky surveys the current role of computation in linguistic research and in the classroom, and takes a look at the job market.

All the papers in this volume touch upon issues in teaching linguistics. Brian Joseph's insightful paper addresses the problem of teaching linguistics, offering

proposals for making such courses more appealing to undergraduate non-linguists, by emphasizing issues and perspectives that relate most closely to the experiences of daily life and the common basis of humanity.

Our thanks to the participants for taking time from their teaching and research to reflect on these neglected issues. We hope the record of these reflections will be of use to the field in the coming years.

Jerry L. Morgan, Professor and Head
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University of Illinois at Urbana-Champaign

Session I:

Current Status and Direction

Chair: Adele Goldberg

Friday, 30 October 1999
9:00 a.m. -11:40 a.m.

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WE HAS SEEN THE ENEMY AND IT IS US: THE ENDANGERED LANGUAGES ISSUE AS A HOPELESS CAUSE

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Linguists claim to be concerned about the endangered languages issue. In reality, nothing substantial is being done about it. There are three main reasons for this. First, linguistics as a discipline is dominated by abstract theoretical concerns in which fieldwork plays a minor part. Second, those dedicated linguists who are involved in basic documentation of endangered languages are drawn into and have their time sapped by language revitalization and linguistic social work projects. Third, linguistic Ph.D. students from non-Western developing countries have been allowed to write grammars of their own languages by introspection and thus have not been trained in field work techniques. Nor have they been encouraged to conduct basic research on other (often endangered) languages in their home countries. In sum, linguists will continue to hold conference after conference in which they decry the inexorable loss of human languages around the globe, but in fact little will be done to provide a scientific record of these languages before they die away.

1.0 Introduction

The figure often bandied about, taken from statements by Michael Krauss 1992, is that there are some 6,000 languages in the world, half of which are likely to be lost within the next century. But, as he points out, the situation is even worse: of these 3,000 remaining, only 600 have a real chance of survival, i.e., if the trend persists, some 90% of the world's languages will be lost. The question Krauss (1992: 7) poses is: 'What are we linguists doing to prepare for this or to prevent this catastrophic destruction of the linguistic world?'

It is only within the past ten or so years that linguists have begun to focus on this issue and to stress the point that the disappearance of languages and linguistic diversity is a major loss to linguistic scholarship and science. Since the endangered languages issue was brought to the fore, however, it has caught the attention of the linguistics profession and has stimulated a large amount of activity. There have been a variety of conferences on the subject and the appearance of a number of major publications, including Brenzinger, Heine, & Sommer 1991, Fishman 1991, Robins & Uhlenbeck 1991, Brenzinger 1998, Grenoble & Whaley 1998, and Matsumura 1998. The lead article in the March 1992 issue of *Language*, written

by a group of distinguished linguists, was devoted to the matter (see Hale et al. 1992).

Even more striking as been the creation of organizations and activities devoted to the topic. For example, the Linguistic Society of America has a standing Committee on Endangered Languages and their Preservation; there is a Foundation for Endangered Languages at the University of Bristol, UK, and an International Clearing House for Endangered Languages at the University of Tokyo. UNESCO is involved in the preparation of an Atlas of the World's Languages in Danger of Disappearing. Non-profit foundations are also springing up, e.g., the Endangered Languages Fund (New Haven) and Terralingua, Partnerships for Linguistic and Biological Diversity (Hancock, Michigan).

Although I think that Marianne Mithun (1998:163) is stretching it when she states, 'At long last the tragedy of language loss worldwide has begun to enter the public conscious [sic],' it is true that awareness of the issue is starting to extend beyond the narrow confines of professional linguists. Here one can cite the informative article that appeared in the *New York Times* (Brooke 1998) and a short piece found in *Newsweek* (Raymond 1998).

My intention here is not to raise the question of why languages disappear (see Mufwene, this volume). Nor do I want to get into the sensitive question of whether it makes any sense to try to renew or revive dying languages (see Ladefoged 1992): once one leaves the realm of emotional hand twisting by overly sentimental scholars, the question is much more debatable than appears at first sight. However, I think that professional linguists *can* agree that the disappearance of a language without documentation is a huge scientific loss. Our linguistic scientific enterprise depends on the multiplicity of languages and the knowledge of linguistic diversity. It is only though knowledge of diverse languages with different structures and belonging to different language families that we can truly begin to gain an understanding of universal grammar, i.e., the nature of the human language capacity. Similarly, our understanding of linguistic typology and our ability to accurately classify languages and reconstruct proto-forms depends on the availability of a wide array of languages.

If one believes this, if one takes the position that no language should be allowed to become extinct without having been scientifically preserved, then one has to acknowledge that the task is urgent. Speakers of endangered languages are not only dying away — the most obvious and final loss — but they are also forgetting their languages and losing command of the richness that defined that language as opposed to the one down the road. As Dixon (1997:147n) correctly points out, 'A sad lesson that has been learnt from the study of language-death situations is that a community does not realize its language is threatened until it is too late to do anything to remedy the situation.'

Dixon's view about what needs to be done is stated in unequivocal terms (p. 144): 'The most important task in linguistics today — indeed, the only really important task — is to get out in the field and describe languages, while this still can

be done. Self-admiration in the looking glass of formalist theory can wait; that will always be possible. Linguistic description must be undertaken now.'

Even if one puts some of the hyperbole aside, the truth is that the problem is real and we linguists are doing very little about it, apart from discussing the matter among ourselves so as to assuage our guilt. This is clearly a case where we cannot shift the blame to someone else: the failure to tackle the endangered languages crisis is not due to some budget dean nor to some philistine of a congressman nor to a CEO of some big corporation. The fault lies with us linguists, the people who should be up in arms about the problem. In essence, to quote Pogo, 'We has seen the enemy, and it is us.'

What I would like to do now is discuss three areas in which we as linguists exacerbate rather than solve the problem. The discussions fall under three headings: First, we linguists don't care; second, we linguists care too much; and third, our non-western colleagues don't care and would be unprepared to help out even if they did.

2.0 We linguists don't care

2.1 Theory

One hates to make blanket generalizations about a discipline as varied and with so many subfields as linguistics. Nevertheless, it is probably fair to say that in terms of overall world view and intellectual orientation, linguistics as a field is fundamentally theory driven as opposed to data driven. There was a time when linguistics was inextricably tied up with the study of non-written, non-western languages; but this is not the case today. General linguists aren't opposed to the study of these languages; it's just that it isn't important to them. What is viewed as important is trying to characterize the species-shared human language capability, i.e., linguistics has branched off from its anthropological and philological roots and has essentially become a branch of cognitive psychology. The lack of concern about the endangered languages problem is an extension of the general lack of interest in descriptive empirical research, whatever the language might be. This lack of interest is reflected in the structure of graduate linguistics curricula (and particularly the marginal position of field methods classes, see Newman 1992), the content of linguistics courses at the introductory as well as advanced levels, and in professional hiring practices. Someone might legitimately ask whether there is any objective evidence to document my claim that the empirical study of 'exotic' languages occupies a marginal position in linguistics. To check this out, I decided to look at Ph.D. dissertations, since what students work on is probably a reasonable reflection of the current ethos in a field and the interests of their teachers. I went through the linguistics section of *Dissertation Abstracts International* beginning in January 1997 and running through June, 1998, i.e., 18 months' worth of entries. Based primarily on the titles, with a quick glance at the abstracts themselves, I classified the dissertations into a number of crude categories, such as English/theoretical, sociolinguistics, ESL, Romance, African, Native American, etc. Granted that my methodology was a bit haphazard and unsystematic, the results were nevertheless instructive. In the year and a half, there were a total of 485 dissertations. Of these,

280 were concerned with English or general linguistic matters; 97 were on European languages, 83 of which were on the big three, namely, Romance, Slavic, Germanic; 78 were on Asian languages, of which 69 were also limited to three groups, namely, Chinese, Japanese, Korean. These three macro categories account for 455 of the dissertations, i.e., 94% of the total. The other 30 dissertations, i.e., the remaining 6%, were on languages of Austronesia (3), Australia (2), Native America (13) and Africa (12). But not all of these 30 represent fieldwork on small 'exotic' languages, since (a) they included studies of major national languages such as Quechua, Hausa, Swahili, and Sango, and (b) it was not always possible to determine from the abstract whether fieldwork was involved or whether it was a theoretical study drawing on secondary materials.

2.2 The culture of linguists (as opposed to anthropologists)

When linguistics was a part of anthropology, as it was for Boas, Sapir, Voegelin, Lounsbury, et al., fieldwork was a natural component of work in the discipline. Anthropology graduate students have traditionally been expected to go into the field; a student who wanted to do an 'arm-chair' dissertation was viewed as a professional misfit. Crediting Kroeber, Geertz (1984:265) speaks of the 'centrifugal impulse of anthropology—distant places, distant times, distant species ... distant grammars.' Clearly there are problems with basing scholarly pursuits on the appeal of the 'exotic' (consider, for example, the concerns expressed by Said 1978), but what is striking about linguistics nowadays, as opposed to anthropology, is its total separation from fieldwork. My personal experience with linguistics graduate students is that they display a singular lack of venturesomeness. Students aren't attracted by the idea of fieldwork for the simple reason that they don't want to go to the field. I suspect that if I had funding to send a dozen graduate students to remote places to do work on dying languages, I would have trouble giving the money away. The students whom I have met would much rather stay in the comfort of a safe place such as Bloomington or Champaign-Urbana or Evanston working within the comfortable confines of the latest (and thus non-risky) linguistic theory. Dixon's charge for linguistics to get out in the field will fall on deaf ears because it runs counter to the prevailing culture and personality of the people who now make up the discipline of linguistics.

3.0 We linguists care too much

When Emmon Bach, a well-known and distinguished linguist, was working on Wakashan, an endangered language of British Columbia, he was challenged by one of the elders as to why he and his community should care about the linguistic work being done. Bach's response was to formulate the following principle (Bach 1995): 'I will try to put at least half of my time and effort in working in a community into things that make sense for the community. What that work might be can range from things as simple as copying tapes for people who want them, through preparing texts, etc., in ways that are accessible, to helping out with language programs etc.' This quotation has been repeated with approbation (and without challenge) by various linguists since, e.g., by a speaker at a fieldwork and ethics symposium held at the 1998 meeting of the Linguistic Society of America and by the

author of a chapter submitted to a volume in preparation on linguistic fieldwork (Newman & Ratliff forthcoming).

Whereas fieldwork does entail real ethical and professional responsibilities to the people whom one is studying (see Greaves 1994; Newman 1992), I am troubled by the notion that we should spend half our time doing what I would call linguistic social work. I know that this is an unfashionable position in the late 1990s, but I would argue that there *is* a value in pure fundamental research and that as scientists we have to resist the ever-present pressure to justify our work on grounds of immediate social relevance. The justification for doing research on an endangered language has to be the scientific value of providing that documentation and in preserving aspects of that language and culture for posterity. The purpose cannot be to make the few remaining speakers feel good.

Having said this — and in principle, I do believe strongly in the correctness of this viewpoint — the reality is that it is impossible to escape the practical and emotional pressures to behave like a caring human being in the field, nor would one want to (see Grinewald 1998:157). In many cases, languages are dying because communities are dying, and they are dying because they are poor and have been neglected, if not directly exploited. The linguist who is welcomed into such a situation will either fail to establish rapport, in which case the research will be a failure, or will establish rapport, in which case he/she will increasingly acquire social and professional responsibilities that will compete for research time. The result is that the good-hearted, well-meaning linguist, for whom we can all extend our admiration, will do less of a job of basic documentation than one would have hoped for.

One might argue that in the case of endangered languages, the intertwining of language preservation as a social goal and language documentation as a scientific goal is, if not beneficial, at least harmless. I think otherwise.

To begin with, language preservation projects drain resources from the important linguistic task of primary documentation, both in terms of personnel and in terms of funding. A case in point is the American Indian Studies Research Institute at Indiana University. For the past half a dozen years or so, the Institute's directors (Ray Demallie and Douglas Parks) and various research associates and research assistants have been doing intensive work on six native American languages, two of which, Lakota and Dakota, are holding their own, four of which, Nakoda (= Assiniboine), Pawnee, (South Bend) Skirii, and Arikara are down to the last few speakers. One should be pleased that such an active research unit exists. However, one needs to point out that a major portion of the Institute's work, work that has received generous funding, has been devoted to the preparation of language teaching materials in Arikara and Nakoda for use in the schools. If one looks at the Arikara materials, for example, one cannot help but be impressed. They are masterfully done with beautiful typography and graphics, and with interactive recordings, etc. Given the quality of the work, which had to have been labor intensive, one can easily appreciate that over half the time and half the money of the Institute has been devoted to the preparation these materials. But what are these materials?

Mostly they are language lessons intended to be used in culture enrichment classes for Arikara students who no longer speak the language and who are not about to revive it. So, although the mood at the Institute is uplifting (and when people from the project go to the Arikara reservation in North Dakota, they are appreciated for the work that they are doing) the fact is that the time and energy of highly skilled and deeply committed field linguists are being dissipated. Resources that could have been used for the basic linguistic description of a goodly number of endangered languages have been devoted to what are in reality ethnic awareness/cultural heritage projects.

The above remarks are not intended to be critical of my colleagues at Indiana. In fact, they are also seriously involved in the preparation of dictionaries and text collection of the kind that we so desperately need for endangered languages. The point that I want to make, and which I feel is valid, is that language preservation/revival as a socially relevant issue has more 'sex appeal' than pure linguistics and thus is bound to seduce well-meaning scholars, especially when the appeal is accompanied by money. Just recently, for example, the Administration for Native Americans announced the availability of substantial grants (up to $125,000 per year for three years) in support of projects that will 'promote the survival and continuing vitality of Native American languages' and will encourage the 'establishment and support of community Native American language projects to bring older and younger Native Americans together to facilitate and encourage the transfer of Native American language skills from one generation to another...' (e-mail distribution from SMARTS grantline, fall, 1998). Given the paucity of funds from the National Science Foundation, etc., for basic research, one can understand why linguists would be thrilled to apply for such grants and, if successful, would gladly embark on the work. But, one can be sure that the Administration for Native Americans is not going to fund revival projects on essentially moribund languages spoken by the last 4 or 5 octogenarians—the money is more likely to go to support seemingly viable languages such as Navajo and Lakota. Moreover, even if funds were to be provided for work with truly endangered languages, such as Arikara, the applied nature of the projects would leave little room for pure research.

Once one leaves the realm of North America, there is also a troublesome question regarding the appropriateness of an activist policy regarding preservation and revitalization of minority languages. A westerner who gets permission to conduct basic linguistic research in Africa (or Asia or Latin America) is a guest in someone else's country who has been allowed to go there for specific scholarly purposes. Language policy in fragile multi-ethnic states is not a simple sociolinguistic matter; rather, it is a serious, highly contentious political matter with which a foreigner should not become embroiled. If as part of its educational and economic policy, a country such as Nigeria should choose to promote its big languages (e.g., Hausa, Yoruba, and Igbo) at the expense of the small ones, the western linguist who takes a 'proactive' role in defense of the smaller, endangered languages is not only being presumptuous, but is also being personally reckless, thereby risking the continuation and success of the field research project, not to mention his/her own safety and welfare. As linguists, we can attempt to educate

and inform responsible persons in government, education, and business about the significance and value of linguistic diversity in their countries, but we have no right to intervene in domestic policy matters nor to undertake linguistic social work under the guise of scientific research.

4.0 Our non-western colleagues don't care and would be unprepared to help out even if they did

It is now 1998, but generally speaking we American (and European) linguists function in many ways just as if it were 1968 or 1948 or even 1928. That is to say, although languages are dying in Brazil and India and Nigeria and Indonesia, we operate as if both the problem and the solution were ours and not the Brazilians', the Indians', the Nigerians', or the Indonesians'. We're way off the mark.

Colette Grinevald (1998:151) has written: 'To accept the fact that South American linguistics should be carried out as much as possible by South Americans has in fact deep implications for the way we conduct our business and the way we basically conceive of our role as linguists.' One could argue whether this necessarily 'should' be the case, but for very real practical matters, this has to be the case, and part of our inability to address the endangered languages problem in any meaningful way is due to the failure to recognize this point. Even if we — by which I mean we Americans and western Europeans — had the will to carry out the needed empirical research on endangered languages around the world, there is no way that we could do it because of political and economic impediments. Most scholars are too well aware of the political and social realities of working in the developing world, namely the persistent hostility to foreign researchers. In many countries, it is a major hassle to get a visa, not to mention official permission to conduct research, and even if these are forthcoming, there are problems in getting in-country cooperation and support. A more serious problem, however, is research funding: it just costs too much money for an American scholar to go abroad to carry out field research. One might be lucky in getting funds for one person to work one year on one endangered language, but who is going to attend to the other 10 or 20 or 30 languages? The only way endangered languages in Africa, for example, are going to get described is if African linguists and their African students do the work. Otherwise it can't get done.

In some sense linguistics in the African area, to which I will limit myself for purposes of the discussion, is already falling into the hands of Africans. Anyone who now attends the Annual Conference on African Linguistics (soon to celebrate its 30th anniversary) cannot help but be struck by the shift in the balance of the participants as opposed to twenty or so years ago. At that time, most of the participants where white (and white males at that); nowadays Africans (some established scholars, some Ph.D. students) generally constitute at least half of the people present.

Further evidence of the importance of Africans in African linguistic research can be gathered by looking at recent Ph.D. dissertations. A count of dissertations on African languages (excluding Arabic) listed in the African Studies Association *Newsletter* from 1990 to the present (which includes theses from Canada and the

United Kingdom as well as the U.S.) gives a total of 95 theses. Of these, 55 were by Africans and only 40 by non-Africans.

At first sight, these figures might be heartening. However, there is a fact of real importance for the endangered languages question that does not come out of the raw numbers. When one looks at the topics and languages treated by the Africans, it turns out that, as best as one can surmise from peoples' names, almost all of the theses are descriptions of the writer's own language. In effect, having said that the study of endangered languages in Africa has to be done by Africans, we find that these people are no more qualified and ready to undertake the task than the most abstract, theoretical MIT linguist. What went wrong? I would suggest that we western linguists have unwittingly distorted the intellectual development and orientation of non-western linguists studying in the U.S. (and Europe) so as to exclude them from any involvement in the endangered languages issue.

For an African to write on his own language, e.g., an Igbo speaker to write on Igbo, is essentially the same as an English speaker writing on English. Those of use who consider ourselves descriptive field linguists and who have little patience with the English speaker who does the umpteenth study of reflexives or what have you in English — obviously in light of the latest theory — have failed to recognize that what characterizes our work is the excitement of discovery with regard to a language that is outside of ourselves, and that the Igbo person who writes on Igbo is not partaking of the same enterprise. Those of us who are quick to say, 'Who needs another study of English?' or 'Why can't that person go to the field and do something of real value such as describing a poorly known language?' do not pass judgment on our African students for what they are doing. We forget that whereas Hausa may be exotic for me, it is not for the Hausa speaker. And by allowing the African students to work exclusively on their own languages, we fail to communicate the importance (and excitement) of fieldwork, which is essential if the person is ever going to do basic research when he/she returns home. In effect, we never encourage or cajole our African students who speak major languages, such as Hausa or Yoruba or Swahili or Lingala or Oromo, to accept the view that what they *must* do when they finish their degrees and return home is undertake the study of minority languages and, moreover, that they must pressure their own students in their home universities to do the same. For a variety of reasons, the students going to universities and studying linguistics (whether in their own countries or abroad) are rarely members of these minority communities themselves; it is members of dominant groups who have these opportunities. As members of our discipline, with all the rights and interests and responsibilities thereof, they should have been brought into the endangered languages fold. Unfortunately, in the absence of visionary scholars who fervently believe that language loss is indeed a culturally and intellectually catastrophic matter, language centers in Africa (and Asia and Latin America) will continue to devote their energies to the promotion and development of large national and regional languages, with scant attention to the languages speeding towards extinction.

Apart from the matter of attitude is the fact that we here in America do not properly train our African students in fieldwork procedures. Since most of our Af-

rican Ph.D. students are writing on their own languages, generally using themselves as informants, we usually fail to give them training in empirical scientific methodology. They are not given solid training in phonetic transcription, witness the fact that those who do not speak a tone language — and even some who do — are seldom trained in hearing and transcribing tone. They are not taught how to manage a corpus (since they are basing their theses on personal introspection) nor how to collect and preserve primary data. Nor are they taught how to collect and transcribe texts and what to do with them once they have them. In short, even if we could convince our African colleagues of the seriousness of the endangered languages question, the Ph.D. education that we have provided them, with its heavy dose of modern theory and elegant formalism, has not equipped them to undertake the task.

5.0 Conclusion

In sum, I am afraid that I have to close on a somber note. Those of us who are concerned about the endangered languages question and would like to see something constructive done about it are up against a formidable enemy, and that enemy is the discipline of linguistics and the individuals who make it up. We can continue to talk about the matter — as surely will be done again and again at meeting after meeting — but given the odds against us, the chances of concrete results are pitifully small.

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Session II:

Crossing Borders & Traditional Links: Exploring Fresh Links with Other Disciplines

Friday, 30 October 1999

1:00 p.m. - 5:00 p.m.

Chair: Jerry Morgan

Saturday, 31 October 1999

9:00 a.m. - 11:45 a.m.

Chair: Braj Kachru

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STRENGTHENING THE TIES THAT EXIST: REEXPLORING CHARTED TERRITORY

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Determining new ways to expand the reach of linguistics and the most appropriate ways to position linguistics in a changing intellectual landscape are particularly important in the face of diminishing budgets and increased business-oriented planning at American universities. However, at the same time, it is important to ensure that linguistics programs have made the most of opportunities that currently exist. The point of this paper is to encourage administrators of linguistics programs to reexplore some of these areas with an eye toward strengthening some of the more traditional cross-disciplinary ties.

I have no handout. I have no overheads. I have no laser pointer or powerpoint presentation. I come to you today as a cranky old linguist. The topic of this symposium 'Territories and Boundaries' evokes a call for us to be forward thinking, considering new possibilities for collaboration in research and teaching as we approach a new millennium — wanting to build that bridge, and so on. And of course in these times of relatively tight budgets at academic institutions, cross-disciplinary programs and research are encouraged as a way of maximizing the impact of scarce resources. Thus, the more new connections we can make to other disciplines the more secure we can feel in continued funding, and perhaps even the possibility of a new tenure-track line now and then. Also as we must produce new graduates to help ensure our survival, so must we hope that those we are educating will someday all have fulfilling jobs with acceptable salaries. So it behooves us to look forward, think imaginatively, and consider new possibilities. But I am largely going to leave that for others to speculate on in their contributions to this symposium. As I said, I come to you today as a cranky old linguist. As such I will mainly look backward and share with you a little of what I am feeling cranky about, because I want to urge us to also consider the possibility of strengthening ties that already exist, ties that are many times underdeveloped and underutilized.

Linguistics has long had the opportunity to cross disciplinary lines. This is something amply recognized by institutions: linguistics programs without departmental standing have been housed in a variety of departments, and scholars and teachers who identify themselves as linguists are members of even more departments. In fact, a search of linguistics department websites and catalogues from around the country reveals that the majority feature a section under faculty enti-

tled 'Linguists in Other Departments'. A cursory glance that the past few decades of the Linguistic Society of America's Directory of Programs in Linguistics shows that this has long been the case in this field. This is something that until recently was not found in most other disciplines that have achieved departmental status and still is found in relatively few. So, as we all already know, linguistics is a discipline rife with opportunities for crossing boundaries. I think, however, that as a discipline we have been more reluctant to embrace some of these opportunities than perhaps we should have been.

One of the things that must be kept in mind is the tension that exists between establishing linguistics as an independent discipline — a discipline with an identifiable identity of its own — and the need to support cross-disciplinary initiatives. Many scholars have expended not a little effort over the past 30-40 years trying to do the former. However, with each new administration that comes into place at our institutions, many of us find ourselves in the position of once again trying to explain what it is linguists do and why we do it (but hopefully not why anyone should care). So, in some regards we have not been as successful as we might have wished in establishing this identity. Naturally, this varies from institution to institution. But while we think about crossing boundaries in the sense of interdisciplinary efforts and so on, it is absolutely essential that we retain the autonomy of the field and foster the notion that we are the experts on language and that is what we bring to cross-disciplinary efforts.

At any rate, there are a number of areas where I think linguists could have made more of a presence felt, but for me chief among them is in the area of language teaching. Now this might strike some as odd. After all, in some ways it might seem that language teaching and acquisition is a realm in which linguists have had quite a presence. And surely the past 15 years or so has seen an explosion in the second language acquisition field with a number of linguistically sophisticated approaches to SLA cropping up, a spate of new conferences, a seemingly revitalized American Association for Applied Linguistics, and the emergence of a number of new second language acquisition and teaching programs around the country. In fact, another contributor to this symposium may give a somewhat different perspective on all this. The problem, as I see it, however, is that the antipathy or at least the mutual disrespect that grew between the fields of theoretical linguistics and language teaching in the 1960's and blossomed in the 1970's remains — albeit somewhat more covertly at times.

The distrust surfaces in a number of ways. A somewhat subtle but noticeable piece of evidence is the fact that the AAAL switched from holding its annual meeting in conjunction with the LSA winter meeting to holding the meeting during a week adjacent to the annual TESOL convention, either in the same city or a nearby locale. However, one fairly obvious and public place one can find the distrust played out is the SLART-L list on the internet. For those who are unfamiliar with it, this is an internet list devoted to discussion of issues in second language acquisition research and teaching. There have been flare-ups here from time to time over the past five years or so. The flare-up generally comes about as the result of someone with some formal theoretical linguistic training who by accident

or design happens to inhabit the world of language teaching as well as the world of theoretical second language acquisition (two worlds which are all too often disparate domains). This hopefully well-intentioned person will ask for a bit more evidence for some position than an interlocutor cares to give (or perhaps is able to give), and then it's off to the races with the usual flaming, name calling, and recrimination. One exchange a while back started innocuously enough. A relative newcomer posted a request for information on the literature regarding first language attrition — the effect of learning a second language on one's first language. One public response was that such a query had no place on the list because there was no direct relevance to language teaching and that's what this list should be all about. A UG type shot back about the possible interest to the question of parameter setting and the UG SLA theory, and the fact that some folks really need to understand what theory is all about and why it is important. So, the war of words began, with all the usual navel contemplation that happens when there's an upset on a not-too-closely moderated list. And what has this got to do with this symposium? I firmly believe that more linguists with serious interests in mainline, mainstream theoretical linguistics need to take a greater interest and role in the education of those who will teach second and foreign languages.

As one looks at the new programs that have sprouted up around the country in response to a perceived need (and more than likely a little niche building), one is immediately impressed by the number of linguists who on paper are involved. The problem is that in many instances the long list of linguists (and for that matter anthropologists, psychologists, and so on) who appear as affiliated faculty is likely largely a public relations effort to convince administrators to fund this interdisciplinary effort and to convince prospective students of the valuable opportunities if one attends them. These are not really idle speculations. My suspicions are fueled by reports I have received from a couple of recent graduates of the Iowa linguistics program who have entered such programs to pursue advanced degrees, and from my experience with a number of graduates of these programs whom I have interviewed in the past five to six years in trying to fill positions in second language acquisition in the Iowa Department of Linguistics.

Having experience as an ESL teacher, and as a current administrator of ESL programs and someone actively involved in the training of ESL teachers, I am thoroughly convinced of the importance of language teachers' learning how to analyze language, the importance of bringing the rigors of thinking about language from the perspective of linguistic theory. This is as true from the perspective of phonetics and phonology as from that of morphology and syntax. Bringing to bear rigorous analysis brings students an important understanding about how language is structured, and the possibility of including a typological perspective permits prospective language teachers to experience the ways in which languages are similar and how they differ. While this may not translate into a classroom activity on Tuesday (and hopefully it will not), it can greatly inform the approach a teacher can take to an unexpected question from a student. During a practicum observation this past summer, I watched a fledgling teacher fully engage two students in a bit of linguistic problem solving when one of the students

posed a question about appropriate adverb placement. After the class I discussed the point with the teacher-in-training and asked why he had handled the situation as he had. He reported that he simply approached the question as he might have one of his syntactic analysis problems and cajoled the students to do a little analysis with him. And my fledgling teacher was right on the money (and he taught two classes each semester this year in our ESL credit program despite his undergraduate status).

So of equal importance to the specific linguistic knowledge gained, the intellectual rigor that is the hallmark of 'serious' linguistic study and analysis can inform the general approach that teachers take to their classroom situations and teaching methodologies and to their dealings with students and administrators. Of equal importance, the intellectual rigor informs the kind of classroom-based or other research graduates of these programs are equipped to undertake. It also helps determine the kind of research these graduates will be able to read and profit from. It is this aspect of things that often goes lacking in some of our training programs. It is this aspect of things that linguists can and must contribute to these programs.

This has been a guiding principle in our TESL training program at Iowa, where students pursuing a Master's take a core linguistics curriculum that includes phonetics, two semesters of phonology, two semesters of syntax, and a linguistic typology course in addition to specialized courses to prepare them to teach English as a second language. Now, this may be more than some feel they can afford to include in their programs or perhaps are able to include. However, our students have responded extremely positively, much as the practicum student I just described, infusing methods of problem solving and analytical thinking to guide their ESL student's learning in a structured, coherent way. Our students have a wonderful track record of getting good jobs and retaining them. And in the past 10 years I have received a wide variety of offers from our graduates to provide testimonials for the effectiveness of the program. The latter is, of course, quite gratifying, but it stems from their awareness that some students whose primary focus is second language teaching fail at first to appreciate the relevance of some of their linguistic study to what they plan to do in the classroom. Needless to say, these types of considerations guide our hiring practice in our intensive English program as well and we have been quite pleased with the results.

All of this is relevant to an initiative at Iowa recently approved by the Graduate Council and the faculty of the Graduate School to begin an interdisciplinary PhD program in foreign language acquisition research and education (FLARE). As is true of a number of institutions, a sizable number of language teaching and linguistics faculty have been hired in the language departments on campus. The FLARE initiative is an attempt to bring these faculty together in a structured way and to meet the challenge of internationalizing the campus. The Linguistics Department has taken an active role on the FLARE steering committee and in the development of the core curriculum, which contains a healthy dose of core linguistics and also affords a rigorous linguistics track. Mainstream, mainline linguistics is represented here as well as more specialized SLA types of

courses. This will ensure the active participation of many members of the linguistics faculty as well as engendering the possibility of more cross-disciplinary research among students and faculty.

So, this is one area where I would suggest that we can reexplore opportunities available to linguists to cross the boundaries of the narrowly circumscribed domains that we sometimes set for ourselves. Linguistics can and should make a strong positive contribution to these programs.

Another area that should most likely come as no surprise, but is one currently under exploration at Iowa, is translation studies. In September 1998 a workshop conducted by the American Translation Association was held at the University of Iowa. This workshop brought together people from language departments, writing programs, information science, communication studies, and linguistics, in addition to translators to consider the topic 'Programs in Translator Education'. The group explored various possible curricular models for graduate programs in translation and information about these various models will be available in a book being produced by the ATA entitled *Programs in Translation Studies: ATA Guidelines*, with publication tentatively scheduled for the fall of 1999.

One of the models, and that heavily favored by the head of the Iowa Translation Laboratory and head of the ATA, includes linguistics in a foundational role. This is largely due to one of the issues that arose in the workshop: while many students come to translation programs with excellent language skills (obviously such skills are a prerequisite for admission), they come with little knowledge of language and languages; that is, many apparently have little knowledge about the richness of morphological and syntactic systems available to human language. This, then, creates difficulties in their education as translators and their abilities in translation.

According to the guidelines to be formulated, the most critical areas are morphology, syntax, and discourse analysis. The reasoning here is that while lexical retrieval clearly plays an important role in the translation process (and therefore information science contributes to the collaborative effort), it is important for translators to recognize the syntactic devices a particular language may have at its disposal that can most effectively be used to translate a passage from a noncognate language. Solid grounding in syntactic analysis and discourse analysis will provide translators with the theoretical foundation necessary to accomplish this. It strikes me again that a typological approach to morphology and syntax could be particularly effective here. It remains to be seen precisely what morphology, syntax, typology, and/or discourse analysis courses might be the best suited in such a program, but it is clear from the ATA guidelines and my discussions with these translators that there is an pivotal role for linguists to play in these programs that they have apparently up to now not been playing. As the head of the Iowa Translation Lab put it to me 'It's vital that translators have a firm theoretical grounding, not only to apply to their translation work but also so that they can go back to theory from time to time to refresh themselves.'

Another traditional link for linguistics is with departments of speech pathology. Given our particular circumstances, there is a fairly active link between Linguistics and the Department of Speech Pathology and Audiology at Iowa. At the curricular level, Speech Pathology students at one time took their phonetics class in the Linguistics Department and current graduate and undergraduate Speech Pathology majors take our upper level introduction to linguistics course as preparation for psycholinguistic courses and developmental courses. We have a fairly large number of cross-listed courses which students take advantage of. At the graduate level, our MA in Linguistics requires a focus area of 4 courses in addition to the core curriculum, intended to get students more deeply involved in a subdiscipline. Other than the TESL focus, which usually engages roughly half of our Master's students, the pyscholinguistics focus is quite popular with students, most of these courses coming from Speech Pathology offerings in speech perception, learning, memory and cognition, and others. At Iowa, the kind of cross-fertilization that we share with Speech Pathology yields a large number of undergraduate double majors and graduates of each department seeking opportunities to do graduate work in programs in the opposite discipline. Some of our graduate students have also had opportunities to work in Speech Pathology labs.

In addition to curricular matters, there are research opportunities as well. Work on Specific Language Impairment has benefitted greatly from interaction with linguistics faculty. More recently, our TESL students and professional staff in our ESL programs have begun to cooperate with members of the clinical faculty in exploring ways to apply some of the clinical techniques used to work with patients with severe speech impediments in teaching pronunciation. While this is still largely in the exploratory stage, it has been found that some of these clinical techniques can be used effectively in helping the ESL student overcome some particularly troubling pronunciation difficulties. This area may hold some promise for interdisciplinary research for students and our professional staff, and more importantly provide an important resource to the classroom that will ultimately benefit ESL students.

There are, of course, other linkages at Iowa and other opportunities, largely in language departments and neuroscience, but we'll be hearing about some possibilities in these areas from other participants in this symposium. So I will not delve into those.

It can be somewhat difficult to make these links, and the kinds of links one wishes to make will depend on the local situation — the particular resources available and the predilections of the faculty. One program which has recently become very active in establishing links with traditionally allied disciplines is the Linguistics Program at the University of South Carolina, currently being headed up by my sometime collaborator in syntactic research Stan Dubinsky. Stan and the South Carolina faculty have recently undertaken a vigorous program in setting up cooperative endeavors with graduate programs in the French Department, the experimental psychology division of the Psychology Department, the English Department; and there are a number of other combinations currently being negotiated. Now, since South Carolina has the structure of being an interdepartmental

discipline, and thus draws its core faculty from nine different departments and has consulting faculty in yet more, this is a fairly natural kind of development. However, it also strikes me that the kind of courses of study being proposed at South Carolina provide some excellent examples of how we can reexplore some of the natural and currently existing ties.

One of these new programs, a joint venture with French, provides either opportunities for a French MA with concentration in French linguistics, or a PhD in linguistics with a minor specialization in French literature. The programs make good curricular use of existing courses with the aim of producing students well-trained in linguistic theory, French linguistics, and French literature. The stated goal of the PhD is to develop potential faculty members for French or foreign language departments. In addition to being forward thinking from the standpoint of training students with marketable skills in a shrinking job market, such cooperation brings with it new funding opportunities for MA and doctoral level students. According to the USC website, other areas currently under development include anthropological linguistics, English composition and rhetoric, philosophy, speech pathology, and other language departments.

An issue that must be kept in mind when thinking along the lines of interdisciplinary curricula is, of course, the impact of setting up such links on our core curriculum and the impact of interdisciplinary curricula on our identity as a field. To what degree does any particular link require modification of existing courses or creation of new courses? What is the impact of admitting or inviting non-linguistics students into linguistics courses, especially if one has a fairly small program? While these must be concerns and must be considered carefully, I would maintain that it is frequently unnecessary to make that many modifications. Again, I would advocate infusion of full-bore linguistics into other disciplines. One area where we have had a bit of experience with that at Iowa is ESL teacher certification. In the mid-1980's, I was one of the few people on the Iowa campus doing any research or teaching in the area of second language acquisition, so I essentially taught the second language acquisition theory course that was available on campus. While this course always included one or two non-linguistics students in each class (usually someone from education or Asian Languages and Literature or one of the other language departments), the class was always relatively small—about 10-13 graduate students or advanced undergraduate majors. The year that the School of Education started ESL certification, there were 30 students enrolled on the first day of class, and more were asking to add. This was quite a shock to the system to say the least. My first inclination was to try to change the course content and the way I delivered it to fit this new clientele. But I resisted that temptation, if only because I still had my linguistics students (albeit as a minority now) to be concerned about. In the end, I was glad to have resisted that temptation. For the most part, the students did fine, and the majority reported appreciating the rigor of the course. Brian Joseph and Greg Ward have described ways in which we can get linguistics into everyone's course of study through the design of classes that reach out to students who usually do not take a linguistics course, classes that explore some of the edges of linguistics. By exposing more students

to linguistics, we might feel a little less compelled to tailor our course offerings to particular groups when they show up in our regular courses.

But all that aside, as we approach the issue of crossing boundaries and the nature of the role linguists can take in interdisciplinary efforts, I would hope that we take care not to lose the autonomy we've developed as a discipline, certainly far from a necessary move. However, more importantly, in addition to looking for new and untested alliances, I would urge us to re-explore some of the territory that's already been charted but underutilized or underappreciated—we may find some fertile old ground in which to establish some strong new roots.

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APPLYING LINGUISTICS AND APPLIED LINGUISTICS IN 2000 AND BEYOND

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In this paper, I consider how applied linguistics is evolving in our 'changing context', the topic of this symposium, as well as how this field connects to other domains of linguistics. My objectives are to:

(1) argue that applying linguistics and applied linguistics are NOT identical and the relation between the two has changed over time;

(2) consider the interdisciplinary nature of applied linguistics;

(3) review some of the current issues that are receiving attention in applied linguistics;

(4) look to future issues that will concern us in the 'changing context' we are dealing with; and

(5) suggest that the preparation of students in linguistics should equip them with the knowledge, skills, and DISPOSITION to work in applied domains — as a matter of employability and of professional responsibility.

Introduction

To begin, it is interesting to note that questions about preparing linguistics students to work on real world problems are by no means new. Roger Shuy, at the 1974 Georgetown University Roundtable on Languages and Linguistics, observed: 'As a result of its isolative behavior, linguistics is now beginning to suffer from not having a natural apprenticeship domain, making it difficult for graduates to find work' (cited in Byrd 1982:1). A few years later, Raskin (1982:3) commented in a similar fashion on the difficulty of even the 'best graduates' in finding an academic position and 'the nature of these graduates' training, which was exclusively "pure linguistics", made them virtually unemployable in any alternative professional capacity'.

The topic of professional responsibility has recently drawn some attention as well. This theme can be found in the anthropological fieldwork tradition where 'giving back' to the community is an important concern. It is also voiced in educational research where knowledge gained by studying schools, students, and educators, is expected to benefit those subjects. A recent symposium on ethics at the American Association for Applied Linguistics (AAAL) included such a discussion (Connor-Linton and Adger 1993), and other linguists have raised similar issues (Rickford 1997; Labov 1982). Sociolinguists like Walt Wolfram and Carolyn Adger have emphasized the importance of bringing vernacular dialect information

back to benefit the community of speakers and working to document endangered dialects, like the English of the Outer Banks in North Carolina, as well as endangered languages (Wolfram 1993).

Applying linguistics and applied linguistics

The field of applied linguistics (as a labeled discipline) was christened in 1946 at the University of Michigan as a term for taking a 'scientific' approach to language teaching. Over the years, the scope of the term gradually expanded — the first international applied linguistics conference in 1964 invited papers in two strands: foreign language teaching and automatic translation (Tucker 1996).

When the Center for Applied Linguistics (CAL) was founded in 1959, its first director, Charles Ferguson, described CAL's scope of work as 'to cover anything that had to do with solving practical language problems' (Ferguson 1998). The initial mandate specifically named language education (to improve the teaching of English around the world and to encourage and improve the teaching and learning of the less commonly taught languages), but added more general goals (to address social and educational problems involving language issues through research and to serve as a clearinghouse of information and convener of diverse groups around language-related issues). The context then was post-Sputnik, and increased global awareness was accompanied by concerns in this country that our educational system was not producing the language competence or the math and science abilities that our nation needed in order to compete with the powers of the world.

As the field continued to develop in the mid 1970s, its interdisciplinary roots became evident, as a group of professional organizations (including the Linguistic Society of America (LSA), along with CAL, the National Council of Teachers of English (NCTE), the American Speech and Hearing Association (ASHA), Teachers of English to Speakers of Other Languages (TESOL), and the American Council on the Teaching of Foreign Languages (ACTFL)), came together to discuss forming a new association. In late 1977, the American Association for Applied Linguistics (AAAL) was established, and it held its first annual meeting in 1978 with the LSA. In a retrospective look at applied linguistics in his plenary address at AAAL's 25th annual meeting in 1993, Tucker noted a shift in emphasis in AAAL programs from the 1970s/1980s to the late 1980s/1990s, from a focus on language teaching to a broader range of issues including second language acquisition, language testing, language for specific purposes, and language policy and planning. The expansion was not just a U. S. phenomenon, however. Rampton (1995:233) recalls that:

> In 1985, the chairperson of the British Association for Applied Linguistics (BAAL) noted: 'We need to be sure that there is not too heavy a bias towards language teaching'. Just five years later, the then chair observed: 'We may have to be careful not to exclude more traditional BAAL interests in EFL/ESOL/ESL'.

Rampton suggests that there was a shift away from language pedagogy and linguistics toward language and social phenomena more generally, 'drawing on anthropology, sociology, and media studies' (Rampton 1995:234). And in 1992, AILA described applied linguistics 'as a means to help solve specific problems in society ... in which language plays a role' (from AILA Vademecum, quoted in Tucker 1996).

Thus, the CHANGING CONTEXT in the latter half of the 20th century reframes language issues that emerge from practical social problems. It is not enough to 'apply linguistics' to these problems — we must build on insights from linguistics in conjunction with insights from other fields in interdisciplinary efforts. One way of looking at it is that applied linguistics ultimately seeks to answer questions outside of linguistics, in another arena, to which linguistic data, methods, or theories may be applied.

Applied linguistics as an interdisciplinary enterprise

Grabe and Kaplan (1992) in their *Introduction to Applied Linguistics* compare applied linguistics to engineering. Engineering gathers expertise from various disciplines (such as physics and chemistry), and engineers of different types rely on certain disciplines of science and mathematics to solve specific problems (physics to design and build a bridge, for example). In a similar fashion, we can think of applied linguistics as using the expertise developed in various fields of linguistics, and then adding insights from other disciplines for different language-related problems (such as anthropology or psychometrics). In other words, applied linguistics is inherently interdisciplinary.

There is considerable recent consensus about applied linguistics as interdisciplinary — Tucker (1996) applauds the field's 'rapid growth as an interdisciplinary field' in his entry on 'applied linguistics' on the LSA website; TESOL's *Applied Linguistics Forum* newsletter comments on its 'vitality and growth as an interdisciplinary field' (Thomas-Ruzic 1997:15).

At the Center for Applied Linguistics, we reflect that interdisciplinary trend—we find we must in order to address real world problems effectively. In a quick review of degrees held by current staff (which numbers about 55), we have a good number holding graduate degrees in linguistics, some in applied linguistics and sociolinguistics, but also degrees in specific languages, cognitive and social psychology, educational psychology, multicultural/bilingual/English as a second language education, educational measurement, health administration, among others. We frequently work with consultants from other fields as well, including law, sociology, and political science.

Current issues in applied linguistics

As we consider areas of current interest in applied linguistics, the changing context becomes very evident in its reflection in the 'real world' problems being addressed.

Consider, for example, language issues that arise related to the movement of refugees around the world. Although by no means a new phenomenon, concerns about refugees in the United States skyrocketed in the mid-1970s in the aftermath of the Vietnam War. There were tremendous demands for materials and services to help meet the language, cultural, and educational needs of Southeast Asian refugees. A huge amount of work was stimulated in adult and vocational education, instruction and assessment in English as a second language (ESL), and the development of native language resources while the concentrated flow of refugees continued from Southeast Asia. There are clearly many language issues embedded in addressing the needs of refugees, and this is an important arena for applied linguistics involvement. At the end of the 20th century, the refugee situation is quite different, and the language problems that come to the fore are different as well. With smaller numbers of refugees headed for the United States from diverse language/culture backgrounds, the strategies for assistance have to change. Shifts in the policy context affect the way in which government support is provided (for example, welfare policy reform in the U.S.) and create new priorities (greater emphasis on skills and language for employment, for example). As a result, serving the current needs of refugee families raises new issues in applied linguistics.

As applied linguistics reaches out to address language problems that arise in fields outside linguistics, numerous areas of ongoing work will take us well into the next millennium.

Innovative language education and assessment

The need for people from different language backgrounds to communicate is becoming even stronger as populations move, meet, and interact with more frequency. Expertise in language education and assessment is needed to help people achieve their linguistic goals and make good use of linguistic resources. A deeper understanding of language acquisition, first and additional, remains an important goal, to provide the grounding for innovative language education and assessment.

A promising trend in language instruction has been the movement toward integrating language and content. This manifests itself in many forms. Content-based language teaching uses interesting and appropriate subject matter as the vehicle for developing mastery of language forms and functions. It emphasizes meaning and meaningful uses of language that provide a scaffold for the learner to higher levels of language proficiency (differing considerably from earlier methodologies that emphasized drill and practice with rote memorization). For minority learners of the majority language in a society (English language learners in the United States, for example), this approach brings the advantage of incorporating content learning (school subjects or employment skills) into language teaching. Refinements of this approach continue to be investigated, including adjustments for proficiency and cognitive levels, attention to specific language forms that may be needed, and the use of authentic and/or accommodated materials (Christian & Rhodes 1998; Short 1991).

A stronger orientation toward proficiency as a goal of language instruction has brought a parallel emphasis on proficiency in assessment. As a result, rating language proficiency (both oral and written) continues to be explored. Proficiency levels are divided into finer distinctions and are being modified for new purposes and new groups of learners (see, for example, recent work on oral proficiency ratings for young children in Swender & Duncan 1998). Ways of administering assessments are also evolving. The basic, face-to-face, oral proficiency interview has been augmented by tape-mediated methods (both audio and video) (Stansfield & Kenyon 1996), and now computer-based proficiency testing is being developed. The changing technology context has obvious implications for both language teaching and assessment.

Crafting sensible approaches to linguistic diversity

Improved understanding of, and sensible approaches to, linguistic and cultural diversity in society are increasingly critical, particularly in schools and workplaces. Language is at the core, both in the real language differences that come into play and in the symbolic proxy it provides. Headlines in recent years on the hot issues of Ebonics and bilingual education demonstrate the widespread misunderstanding of the underpinnings of those issues and of language in general. As a member of LSA's Committee on Language in the School Curriculum from 1996 to 1998, I noted that most of the committee's discussion focused on language issues stemming from diversity. While we understand many of the linguistic principles underlying variation in language (vernacular and prestige dialects) and multilingualism in society, addressing the many educational and social issues that arise in connection with diversity remains a complex undertaking.

Our research, for example, points to an array of advantages stemming from the instruction of immigrant students through their native language while they learn English (and beyond). In the real world of schools in the United States, however, we find a serious shortage of qualified teachers who know the languages of students who are in the process of learning English, among other limitations in their readiness to work with second language learners. We cannot afford to offer a simple 'either/or' statement or prescription; we must consider the full picture and explore ways of tackling such issues using all the knowledge and resources that can be mustered from applied fields (in this example, through such means as increasing the preparation of bilingual teachers or finding alternative instructional methods and supports for the students) (Genesee 1999). Issues related to language diversity in schooling arise in many countries, of course, and it is common for students around the world to encounter schools where the language of instruction is not their mother tongue (Dutcher 1995).

Policy and planning in language-related contexts

Closely related to the two areas just discussed are policy and planning concerns in language-related contexts, an important area of applied linguistics application. Increases in diversity related to political developments call for policies to promote the welfare of individuals, groups, and societies. The movement of populations

around the world (the 20th Century has been called 'The Century of the Refugee') and the realignment of national boundaries has created enormous needs for policies to address educational, social, and political matters, and then planning to implement these policies. The decisions to be made require substantial information about languages, language use, and language learning, not to mention clarification of misunderstandings and debunking of myths in all of those areas. There are obvious language-policy decisions, such as the designation of an official language, as well as policy decisions where the role of language is less obvious, such as financial decisions about providing interpreters in court proceedings. As we know, the United States does not have an explicit formally stated language policy, but there are implicit language policies embodied in diverse federal, state, and local laws and regulations (Christian [Forthcoming]). Policy formulation and analysis that is informed by linguistic expertise is increasingly needed.

It is clear that much better information and understanding of how language works and how people learn languages is needed. Many myths and misconceptions about language pervade public discourse and underlie policy decisions at all levels. Many arguments against bilingual education, for example, can be traced to a belief that maintaining a native language lessens the 'space available' for mastering the majority language. There is also a popular conception that standard varieties of a language are somehow inherently better than vernacular varieties ('good' and 'bad' English, as we've all heard about) (Wolfram et al 1999). The link needs to be made between social/political issues and accurate linguistic information, a connection that can be found in the scope of applied linguistics.

Issues in business and the workplace

It has become almost a cliché to talk about the 'global' economy and globalization of business. As corporations and governments work multinationally, understanding how to accomplish communication across languages and cultures becomes increasingly important. Translation, interpretation, and language learning for specific purposes are skills that more and more businesses value. Many companies are themselves multinational and face situations not unlike multilingual societies. One such corporation, for example, grappled with a corporate language policy, deciding what language would be the common language across offices around the world (not surprisingly, English was chosen), and what levels of language skills were needed by staff in different positions in the various offices.

Language issues in the workplace have also grown in salience recently. In the mid-1980s, Shirley Brice Heath and Charles Ferguson organized and taught a course on 'Language in Professional Contexts' at the LSA Institute at the University of Illinois—Urbana/Champaign, one of the first attempts to bring together developing knowledge about professional varieties (primarily of English), including those in law, insurance, medicine, and so on, with a particular view toward what linguistics could contribute. Interest in discourse in professional settings is growing, and technology contexts (and applications) are of great concern now. As linguistic diversity in the workplace has gotten more attention, cross-

cultural communication, vocational language learning, and language assessment are emerging as bigger issues in need of input from applied linguists.

Future directions in applied linguistics

Working on the issues outlined in the last section is clearly going to take us well into the next millennium. For future directions in applied linguistics, we should also consider features of the changing context that will have implications for our work, as we think about problems outside linguistics that would benefit from linguistic tools and information.

A recent study of trends for non-profit organizations illuminated some of these changes underway. KPMG Peat Marwick 1997 undertook the study to inform public service organizations of the forces that will affect their work in the next decade. Several of the themes they consider relate clearly to language issues (demographic, economic, and technological), although the authors do not specifically draw those connections. A brief look at their conclusions can highlight focal areas — some ongoing, some new — that may call for attention from applied linguists.

Within the DEMOGRAPHIC theme, two trends are noteworthy here. First, the population will continue to grow more diverse, but the notion of a 'melting pot' is being transformed into an expectation of multiculturalism, where cultural diversity is appreciated and individuals take pride in their heritage. We may look forward to increasing interest in language revitalization and better cross-cultural communication. Second, the population will be significantly older: 'While one in every 25 people was over age 65 in 1900, by 2040, one in every four or five Americans will be over 65' (KPMG Peat Marwick 1997:2). Language issues related to aging will not only be medical in origin (language pathologies), but also social (cross-group communication patterns), and cognitive (language learning and development).

The ECONOMIC theme highlights a 'growing demand for knowledge workers' and an 'increase in international competition' for the United States. Preparing students and workers for 'knowledge' industries calls for different types of skills than workers have needed in the past, many of which depend on language-related competencies. They include new types of communication processes, literacy skills, and technical language skills, that need to be better understood so that they may be developed and assessed.

Finally, the TECHNOLOGICAL theme points out trends that may be having the most dramatic effects upon our lives. Technology is 'changing the way we learn, work, and govern' (KPMG Peat Marwick 1997:7). As people and institutions are increasingly linked through technology, communication and education are becoming independent of time and location, causing a transformation in our habits and expectations. This trend affects both the demands on language, as the medium of communication, and the ways in which we learn and assess language. For example, conceptions of what constitute 'literacy' are changing, as it expands to include visual, non-print, as well as print domains (consider the use of icons on

computers, fast-food restaurant cash registers, and elsewhere). There is also 'increased public access to information', that calls for more sophisticated systems for organizing and presenting information to diverse audiences.

In a review closer to home, a National Science Foundation report in 1996 looked at linguistics from the perspective of developing human capital, identifying research questions for the future and potential areas for contributions from linguistics (Wolfram & Schilling-Estes 1996). The panel was convened by Walt Wolfram and set its premise as follows:

> Given the cognitive basis of the human language faculty and the sociocultural context in which language use is embedded, linguistic investigation has played and should continue to play a central role in advancing our basic understanding of the effective utilization of human capital. (Wolfram and Schilling-Estes 1996:1)

The panel found strong links between areas of linguistic research and potential contributions to inter-related issues that are basic to building human capital. These themes provide another perspective on issues outside linguistics that applied linguists can positively affect. They include:

'fostering successful families' (p. 4)
'building strong neighborhoods' (p. 5)
'educating for the future' (p. 6)
'employing a productive workforce' (p. 8)
'reducing disadvantage in a diverse society' (p. 9)
'overcoming poverty and deprivation' (p. 10)

Conclusion

This brief review is by no means exhaustive. Issues have been mentioned as indicative of the kinds of topics applied linguistics can and should be addressing, particularly as we move into through the changing contexts of the future. Linguists need to play a role in applied linguistics — if they don't, others will deal with language issues and not nearly as well — but they must be prepared to work with specialists from other disciplines and to draw on other knowledge-bases in addition to linguistics.

Students of linguistics must be allowed and encouraged to explore both applied and theoretical issues as they make their ways to their degrees and decide where to specialize. Part of the changing context is, of course, the changing student population. The typical graduate or even undergraduate students have significantly more work experience than in the past, and many are working professionally while they pursue their studies. This provides a natural venue for taking a problem-solving approach to linguistics learning. INTERNSHIPS or practica would also provide real experiences in real life problems, in areas of business, government, education, social services, and a wide variety of other settings.

Linguistics departments should also make excellent courses available to students in other specialties, to inspire knowledgeable and interested collabora-

tors in our future interdisciplinary efforts (as well as to help develop a better-informed citizenry).

Students of linguistics need to get into the field and work on theoretical issues (these are not mutually exclusive by any means!) to appreciate the value of both. If they head toward applied linguistics areas, in particular, they must be given the knowledge, skills, and dispositions to identify and address language problems in interdisciplinary ways. They also must understand the need to monitor the changing context to look for signs that will tell us where the practical language problems of the future lie. We must ensure that the accumulated knowledge and tools of linguistics remain at the table when language-related problems are taken up.

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CONSIDERATION OF THE PAST, PRESENT, AND FUTURE ROLES OF THE NEUROSCIENCES IN THE LINGUISTIC SCIENCES

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For thousands of years, the human brain has caused both bewilderment and fascination. And although the brain is the ultimate source, arbiter, and conduit of human language, an understanding of even the rudiments of its role in language comprehension and production has been a relatively recent development, arguably dating to the latter half of the nineteenth century. In the present discussion, a review of significant approaches to the human brain will be considered from a diachronic perspective. Particular emphasis will be placed upon developments which have provided the foundation for interaction between the neurosciences and linguistic sciences. Consideration of emerging approaches to the study of the brain will also be made for, it is maintained, such approaches will be particularly fruitful in providing new and important insights into the brain/language relationship.

0. Introduction: Our universe within

In his ambitiously compendious volume, *How the Mind Works*, Steven Pinker (1997:24) wryly notes that, while 'the 1990s have been named the Decade of the Brain, ... there will never be a Decade of the Pancreas'. While the relative importance of the investigation of the brain versus the pancreas may be eminently obvious, Pinker's observation actually belies a truism about the human brain. That is, unlike any other organ, the brain has what Pinker terms 'special status' which derives 'from a special thing the brain does, which makes us see, think, feel, choose, and act. That special thing is information processing, or computation' (1997:24).

Indeed, the brain's computational ability is one of the reasons why the multifarious functions of this organ have been difficult to understand. Even gaining rudimentary insights into how the nervous system transforms simple sensory inputs into complex mental constructs has taken decades of research. For example, in the auditory system, a word to be perceived begins (simply) as a series of sound waves causing vibrations which impinge upon the tympanic membrane (eardrum) of the hearer. These vibrations are transduced, transformed, and relayed to higher centers of the brain where they are ultimately interpreted as a lexical unit (Rosenberg 1982; Lieberman & Blumstein 1988; Mack 1991). This unit has associated with it often rich denotative and connotative meanings, an understanding of the rules governing the syntactic and thematic roles to which it may be as-

signed, and specific acoustic cues enabling the listener to engage not only in speech recognition, but SPEAKER recognition.

The human brain is remarkable not only computationally but structurally as can be demonstrated by an examination of the primary building block of the brain, the neuron (nerve cell). Although an adult brain weighs just three to four pounds, it contains a total of approximately one trillion cells, of which about 100 billion are neurons — nerve cells which transmit electrochemical signals throughout the peripheral and central nervous system (CNS). Neurons are generated at an average rate of about 250,000 per minute prior to birth (Cowan 1979), a fact which helps provide some perspective on the magnitude of the numbers of neurons in the developing brain. Moreover, neurons vary considerably in shape, size, and function (Fischbach 1992). The complexity of the human brain becomes especially apparent in view of the number of other neurons with which each neuron connects: Any given neuron may connect, via synapses, to approximately 1,000 other neurons, and each neuron may have thousands of synapses (Stevens 1979; Lamb 1998). In addition, the scale of the neural components of the brain is exceedingly small. For example, approximately 20,000 to 25,000 neurons occupy one cubic millimeter of cerebral cortex (Lamb 1998), and the width of the synaptic cleft — the juncture between neurons — is less than one ten-millionths of an inch. (The cortex, whose name is derived from the Latin word for plant bark, is the outer layer of the brain — a thin sheet of gray matter containing the nerve cell bodies.) Hence, gaining an understanding not only of individual neurons but of the functions of inter-related NETWORKS of neurons can be highly difficult due, in part, to the complexity of the brain's 'wiring system' and to the extremely small scale of the components involved.

In addition, as Francis Crick 1979 has aptly indicated, introspection about the brain is remarkably unrevealing. Indeed, he states that 'we are deceived at every level by our introspection' (1979: 132). For example, Crick 1979 and Crick & Koch 1992 note that most individuals do not realize that they have a 'blind spot' in each visual field caused by an absence of photoreceptors in a small area of the retina — that area in which the optic nerve projects to the brain. The blind spot is undetected because the brain interpolates the missing information. Moreover, one of the most anatomically striking features of the brain is a deep longitudinal fissure dividing the brain into a left and right hemisphere, each of which has specialized functions and preferred processing modes (Springer & Deutsch 1993). Further, each hemisphere subserves the functions of the body contralaterally (i.e., the right half of the brain controls the left side of the body and the left half of the brain controls the right side of the body). Thus the brain is bifurcated both anatomically and functionally. Yet, unless one obtains explicit information about the anatomical bifurcation and functional lateralization of the brain, an awareness of the fact that the brain has two discrete hemispheres remains entirely inaccessible to introspection or consciousness.

These relatively simple examples reveal why Crick (1979:132) concludes that 'our capacity for deceiving ourselves about the operation of our brain is almost limitless, mainly because what we can report is only a minute fraction of

what goes on in our head.' He adds that 'this is why much of philosophy has been barren for more than 2,000 years and is likely to remain so until philosophers learn to understand the language of information processing'. Although enormous strides in understanding the brain have been made since Crick wrote these words (and although it can be argued that philosophy has hardly been 'barren' for the past two millennia), it is the case that, throughout most of the history of *Homo Sapiens*, the role of the brain — our 'universe within' — has been variously misunderstood, misinterpreted, and even maligned.

1.0 Where is language? Historical perspectives

Archeological evidence has revealed that in many Old- and New-World prehistoric cultures a crude form of surgery, trepanation, was practiced relatively frequently. Trepanation, in which a hole is bored into the skull, was carried out possibly for ritualistic or medicinal purposes. What is remarkable about this is not only the frequency with which trepanation occurred (one wonders at the temerity of those who dared to carry out — and to undergo — the procedure!), but the fact that it had a fairly high survival rate. (This is revealed by signs of healing around the site on the skull.) Trepanation suggests that prehistoric societies possessed 'strong beliefs about the brain and behavior' (Finger 1994:5) since the procedure may have been used to treat headaches, seizures, and mental disturbances. However, this interpretation is mitigated by the observation that 'these disorders were likely to have been attributed to demons, and it is conceivable that the holes were made to provide the evil spirits with an easy way out' (Finger 1994:5). Thus there is no clear evidence that the 'trepaners' understood the function of the brain or why trepanation was efficacious, if indeed it was.

However, an ancient Egyptian text dealing with head injuries, the *Edwin Smith Surgical Papyrus* (parts of which date from at least 2000 B.C.), does reveal some insightful perspectives on the central nervous system. Finger (1994:8) says that early Egyptian physicians were aware that 'symptoms of central nervous system injuries could occur far from the locus of damage', suggesting a relatively advanced understanding of the relationship between the central and peripheral nervous systems. Yet in spite of their apparent insights into the physiology of these systems, the ancient Egyptians still that believed the heart, not the brain, was the paramount organ — an organ that recorded all of one's good and evil deeds. And, as evidence from mummification indicates, the heart was accorded higher status than the brain which, unlike the heart and other organs, was virtually never preserved.

Early written records of medical practices from other cultures also reveal some knowledge about the brain. For example, the ancient Indian work, the *Atharvaveda*, 'provides descriptions of epilepsy, insanity, neuralgia, headaches, and blindness' (Finger 1994:11) but again, the heart was viewed as more important than the head, as revealed in evidence from Vedic collections on medicine. The ancient Chinese also emphasized the primacy of the heart which they believed would cause memory lapses and insomnia if it were not filled with energy and blood.

Moreover, in words dating from well over two thousand years ago and attributed to or inspired by Hippocrates — long acknowledged as the father of modern medicine — these assertions are made:

> It follows that southerly winds relax the brain and make it flabby, relaxing the blood-vessels at the same time. Northerly winds, on the other hand, solidify the healthy part of the brain while any morbid part is separated out and forms a fluid layer round the outside. ... The brain may be attacked both by phlegm and by bile and the two types of disorder which result may be distinguished thus: those whose madness results from phlegm are quiet and neither shout nor make a disturbance; those whose madness results from bile shout, play tricks and will not keep still but are always up to some mischief. ... Warming of the brain ... takes place when a plethora of blood finds its way to the brain and boils (Lloyd 1978:248-9).

Thus, the brain was not only believed to alternate in consistency (from 'flabby' to solid) due to atmospheric changes, but was deemed capable of housing a cauldron of boiling blood. It was also believed to cause insanity should it be attacked by two of the four 'humors' — one now known to be respiratory-system mucosa and the other an alkaline fluid secreted by the liver. On the other hand, Hippocrates and his followers accurately understood that the brain controlled the body, and they rejected the idea that gods and demons caused seizures (Finger 1994).

In spite of such insights, the ancient Greeks (as well as the ancient philosophers and linguists of India) fared better in their understanding of language than they did of the brain. For example, Aristotle's *Poetics*, a commentary on literary theory dating from the third century B.C., provides an extensive and relatively sophisticated discussion of rhetoric, diction, stylistics, morphology, syntax, metaphor, grammatical gender, word coinage, and articulatory phonetics. Moreover, Aristotle clearly and often accurately defines such units as free and bound morphemes, syllables, and sentences. Yet at the same time he believed that the heart, not the brain, was the body's nerve center and the seat of intelligence and that the function of the brain was to cool the blood (Adams 1971). (By contrast, Aristotle's mentor, Plato, correctly identified the brain as the seat of the intellect [Longrigg 1998].)

Considerable advances in understanding the brain came with the 2nd-century Greek physician and anatomist, Galen, who actively practiced as a surgeon in Pergamon and later served as court physician to four Roman emperors. In his teachings, which prevailed for approximately 1,500 years, Galen correctly concluded that both motoric and sensory functions originated in the brain, and many of his theories provided the foundation for later work on the CNS. Further, he demonstrated a perspicacious understanding of the value of combining *logos* (reason) with experience in the healing arts (Walzer 1946). Nonetheless, his work still represented 'a reservoir of medicine mixed with myth and magic' (Fincher 1984:13), for Galen maintained that 'vital spirits' produced in the heart were

transformed into 'animal spirits' in the brain where they were stored in the ventricles until needed (Finger 1994).[1]

By the Middle Ages in Europe, most physicians still made erroneous assumptions about the structure and function of the brain. Although Medieval sketches of the brain depict the ventricles (cavities in the brain filled with cerebrospinal fluid), they were believed to be 'a cluster of psychic cells charged with powers of *memorativa*, *imaginativa*, *cogitatia* and *sensus communis*' (Fincher 1984: 11). However, in 1543, Andreas Vesalius of Brussels published *De humani corporis fabrica*, a goldmine of anatomical illustrations and woodcuts (some possibly by Titian or the school of Titian) depicting the brain and body (Tarshis 1969). Most significantly, the central nervous system was, at last, portrayed and described relatively accurately, and Vesalius' book revealed detailed knowledge of the structure of the brain, the spinal cord, and even the cranio-facial nerves (Lind 1949).

Finally Descartes, one of the founders of the Enlightenment, refers to the functions of the central nervous system in his 1664 work, *Description du corps humain*. His views reflect a synthesis of philosophy, religion, physiology, and neuroanatomy, as is revealed in the following description of his beliefs about the soul and cognition (Carter 1983:138):

> In order to act reasonably [Descartes believed that] the soul must act through the agency of some part of the body. ... In order to will, the soul acts on the pineal gland, so that it pushes the surrounding spirits, ... which then mechanically control the body's movements in such a way that the soul can consequently perceive the objects of its volition. ... Ideas are corporeal impressions caused by configurations of individual impresses made by spirits issuing from similar configurations of nerve endings in ventricle III, the middle ventricle of the brain.

In truth, in light of the complexity of the human brain (or, in fact, of the central nervous system which includes the brain and spinal cord), it is not surprising that a relative lack of understanding endured for thousands of years about its structure and function. And although some microscopic views of nerve tissues were made in the Netherlands by Anton van Leeuwenhoek and in Italy by Marcello Malphighi as early as the 17th century, it has been little more than one hundred years since Camillo Golgi devised a method for selectively staining nerve tissue so that individual neurons could be viewed microscopically and in great detail (Hubel 1979). And it was not until the 19th century that differential FUNCTIONS of brain regions — particularly as they related to language — were fairly well understood. It is thus understandable that early physicians, anatomists, and philosophers knew relatively little about the brain's neural architecture, its physiology, or its role in acquiring, perceiving, and producing language.

What is also relevant to the present discussion is that, from the time of the ancients to the mid-19th century, those interested in understanding the brain and those interested in understanding language had relatively little substantive information to provide one another. Arguably, it was not until physicians undertook

systematic observations of aphasia (language impairment due to specific types of brain damage) that meaningful insights about the brain-language relationship began to emerge.

One early commentary on aphasic-like symptoms was made by a French physician, Lordat, and appeared in the 1843 *Journal de la société de médecine-pratique de Montpellier* (excerpted in Paradis 1983). In this commentary, Lordat writes of an apparently aphasic patient who had lost all language functions, save the ability to use swear words one of which, according to Lordat, was 'the most energetic swear-word in our language, ... which our dictionaries have never dared to print' (Paradis 1983:4). Lordat also assumed that the patient was unaware of the meaning of what he was saying since the man was both intelligent and a priest. It is unlikely that either intelligence or religious persuasion correlates with type of language loss in aphasia, but Lordat's observations about the linguistic abilities of his 'apoplectic' patient presaged thousands of subsequent studies — clinical, psycholinguistic, and neurolinguistic — of the relationship between brain damage and the use of language.

Specifically, serious neurological study which had a profound impact upon the linguistic sciences emerged in the late 19th century when a French physician, Paul Broca, observed that a specific region of the left frontal lobe (now known as Broca's area) was apparently responsible for certain types of speech production. This area has been implicated in non-fluent and agrammatic speech and in some language-processing deficits (now recognized as 'Broca's aphasia). And in the 1890s, a German physician, Carl Wernicke, provided further information regarding the relationship of brain structure to language behavior when he observed another form of aphasia — one largely characterized by fluent but meaningless speech and usually resulting from damage to the temporo-parietal region of the left hemisphere. This is termed 'Wernicke's aphasia'.[2]

The importance of the study of aphasia in the linguistic sciences cannot be overestimated. As will be indicated below, investigations of aphasia were largely responsible for the emergence of several major research foci which, by the mid-20th century, dominated much of the work that furthered an understanding of the brain/language relationship.

2.0 Language is found: Major trends in the mid-20th century, 1950-1980

Anecdotal evidence suggests that some linguists look back wistfully upon the 1950s through the 1970s as a 'golden era' in the linguistic sciences. However, this 'golden era' may have had a major competitor. As Greene maintains (1974:497,499],

> The events of the very late eighteenth century and the early nineteenth century [are ones] which all linguists seem to recognize as revolutionary, formative, and "paradigmatic" in the sense defined by Thomas Kuhn in his book *The Structure of Scientific Revolutions*. ... With respect to the situation in linguistics since about 1870, there seems to be general agreement that there have been revolutionary de-

velopments, though not of a kind that can be fitted into Kuhn's model of anomaly, crisis, and paradigm substitution. What has taken place is not a revolution within the framework of historically oriented comparative philology but rather a dramatic shift of interest and attention from diachronic to synchronic studies.

Yet even if a full-fledged Kuhnian revolution did not occur in linguistics in the 20th century, there was a relative explosion of linguistic study in numerous areas of language inquiry during this time. For example, Newmeyer 1980 notes that, while official membership in the Linguistic Society of America stood at 829 in 1950, it rose to 4,166 by 1968. And while only sixteen doctorates in linguistics were awarded in the United States in 1956-57, 177 were awarded in 1972-73. While this was still a small percentage (.51%) of all doctorates awarded in 1972-73, it did represent an elevenfold increase over a sixteen-year period. (During the same period, the number of doctorates awarded in all fields increased only fourfold.)

It is tempting to date the onset of widespread interest in linguistics, at least in the U.S., to the appearance of Noam Chomksy's 1957 seminal work, *Syntactic Structures*. Here he presents his theory of transformational-generative grammar — a rationalist approach to the study of language diametrically opposed to that of, for example, the empirical behaviorist approach of B.F. Skinner (whose volume, *Verbal Behavior*, appeared in the same year). Indeed, by the time Chomsky's next major work, *Aspects of the Theory of Syntax*, was published in 1965, linguistics graduate students were already fervidly memorizing transformations, drawing often-complex inverted tree diagrams, and ardently debating about the psychological reality of deep structures.

Meanwhile, fresh ideas were emerging (or had recently emerged) from numerous fields within linguistics as evidenced by a sampling of works which are now standards. These included volumes on phonetics and phonology (Jakobson & Halle 1956; Chomsky & Halle 1968); sociolinguistics and dialectology (Hymes 1964; Labov 1966); historical linguistics (Robins 1967); psycholinguistics (Whorf 1956; Brown 1970); child-language acquisition (Smith & Miller 1966); bilingualism and second-language acquisition (Weinreich 1953; Albert & Obler 1978); language universals (Greenberg 1966); the philosophy of language (Searle 1969); the origins of language (Lieberman 1975); animal communication (Seebeok 1977); and neurolinguistics (Lenneberg 1965; Whitaker & Whitaker 1977).

The neurosciences informed (if sometimes only tangentially) research in virtually all of the above areas. But it is here maintained that in the mid-20th century the neurosciences had their greatest impact upon three major topics of inquiry, all of which fell under the rubric of neurolinguistics. These included (1) the use of insights gleaned from the study of brain-damaged individuals, particularly those with aphasia; (2) the view of language as anatomically localized and functionally discrete; and (3) a belief in the pre-eminent status of the left cerebral hemisphere as the 'control center' for language.

2.1. Brain damage: A window on the brain

Brain damage has long been one of the primary sources of information about the organization of language in the brain, and myriad types of language impairment resulting from brain damage have been documented. These include, but are not limited to, agraphia (impairment in writing with possible preservation of the ability to read), alexia (impairment in reading with possible preservation of the ability to write), anomia (impairment in the retrieval of lexical items from memory), aprosody (impairment in the ability to use suprasegmentals), and aphasia (impairment in the production and/or perception of language manifested, e.g., selectively or primarily as mild to severe difficulties in the comprehension and production of morphosyntax, as in Broca's aphasia, or as mild to severe difficulties in the comprehension and production of semantically meaningful speech, as in Wernicke's aphasia).

There are, of course, problems with extrapolating about intact brains using information based upon damaged brains — an approach known as 'deficit analysis' (e.g., Gazzaniga 1984; Caplan 1987). To determine the locus of damage, examine its behavioral consequences, and then infer that the locus involved is responsible for the lost or impaired abilities reflected in the behavior overlooks several widely accepted facts. First, damage to a particular region of the brain does not produce identical results in all individuals. Second, various sites of damage in different individuals may yield strikingly similar impairments. Third, brain-damaged patients may employ compensatory strategies that can mask the severity of their problems. And fourth, establishing a correlation between the site of neurological damage and a behavioral deficit is often based upon the assumption that the lesion is in the region that subserves the previously normal behavior when, in fact, the damage has caused a disruption in the neural CONNECTIONS which implement the behavior.

A simple analogy is the following: Cutting the cable connecting a computer to its monitor results in an immediate loss of the visual display (assuming that the computer is on). If one only observed the site of damage (the 'lesion' in the cable) he/she might conclude that the visual display resided in or originated from the cable which, of course, it does not; it is merely the conduit for information stored at some distance from it. Of course, neurologists are far more informed about the functions of the brain (and most people know far more about computers) than this analogy might imply. Still, there is a long tradition of using the 'lesion method' (Banich 1997) and deficit analysis to correlate neurological damage with specific behaviors, and such an approach is still providing new information and insights (e.g., Saffran forthcoming).

Of all language disorders, aphasia has attracted the greatest interest among linguists not only due to the relatively high frequency with which it occurs — often as a result of a cerebral-vascular accident (stroke) — but because of its potentially devastating behavioral consequences. (For example, global aphasia can render an individual essentially completely unable to understand or produce language.) In addition, because the locus of brain damage can often be determined, at least generally, neuroscientists and aphasiologists have used aphasia as a

'window on the brain' — a window which can reveal at least some aspects of the relationship between brain regions and language functions.

The prolific polymath, Roman Jakobson, may be credited with emphasizing very strongly how insights from neurology — through the application of the lesion method in the study of aphasia — could inform linguistic theory (e.g., Jakobson & Halle 1956; Jakobson 1971). He asserts, however, that 'the neurobiologist Hughlings Jackson (1835-1911) was the first to discern with insistence the linguistic aspect of aphasia' (1973:59). Still, Jakobson's primacy in advocating the potential value of interaction between the neurosciences and linguistics cannot be ignored. For example, one of the chapters in the book he co-authored with Morris Halle in 1956, *Fundamentals of Language*, is entitled, 'Aphasia as a LINGUISTIC Problem' [emphasis added]. In this chapter, he decries the current state of affairs in aphasiology, stating that linguists are 'responsible for the delay in undertaking a joint inquiry into aphasia' in spite of the fact that 'the aphasic disintegration of the verbal pattern may provide the linguist with new insights into the general laws of language' (1956:56). In other words, even by the 1950s, the neurological data were bountiful, but few linguists were helping with the harvest.

In all fairness, as the aphasiologist Ruth Lesser 1978 points out, it was not merely a stubborn resistance to acquiring information from the neurosciences that impeded cross-disciplinary interaction in aphasiology in the mid-20th century. Lesser (1978:ix) observes that aphasiology 'includes within its sphere some rich complexities, notably the physiology of the human brain, the psychology of the individual, and linguistic science', which complexities may (understandably) have induced some individuals in potentially relevant disciplines to 'shy away' from the topic. And, from a more applied perspective, she notes that — at least as of the 1970s — the examination of aphasic patients was often 'undertaken heuristically within a medical [not linguistic] tradition which emphasize[d] physical improvement, diagnostic labeling and the perpetuation of simplistic formulae for language disorders'.

However, even by the time Lesser penned the above comments, a sea-change was apparent: Jakobson 1971 notes that, as early as the 1940s, both A.R. Luria and Kurt Goldstein had attempted to apply principles of linguistic analysis to aphasia. And, by the 1960s, Jakobson and other linguists were relating types of aphasia to specific linguistic deficits, an approach later reflected in what would become one of the most widely administered aphasia test batteries ever used, the *Boston Diagnostic Aphasia Examination* (Goodglass & Kaplan 1983). This change was also evident in the scores of studies on aphasia conducted by linguists in the 1970s. One prominent linguist, Sheila Blumstein, contributed to many of these (e.g., Blumstein 1973; Blumstein, Baker, & Goodglass 1977; Blumstein et al. 1977) and is still doing so today (Blumstein, et al. 1991; Blumstein 1997). Another well-known linguist, Michel Paradis, also stimulated interaction between neurology and linguistics with the appearance in 1977 of his extensive survey and analysis of bi- and multilingual aphasics, and his work in this area has continued unabated. In addition, examination of the contents of major journals dealing with studies of the brain and language reveals that, by the 1970s, hundreds of

cross-disciplinary studies in the neurosciences and linguistic sciences were being undertaken in the U.S. and abroad — many of these on the subject of aphasia.

Thus the mid-20th century witnessed the application of insights from the neurosciences to the investigation of language breakdown and, more specifically, to aphasia. Concurrent with this was a dramatic increase of interest in the extent to which language was localized in the brain.

2.2. A locationist view of language

Due to insights gleaned largely from the study of aphasia, a still-pervasive view of language organization (long ago articulated by Wernicke) is that language is situated in 'anatomically discrete [but] interconnected centers' (Zurif & Swinney 1994:1056). It can be argued that such an approach had its roots in the work of the 18th-century anatomist, Franz Joseph Gall, whose work revealed a strongly locationist interpretation of brain functions. This is evidenced in the 'pseudoscience' he practiced — phrenology — in which the contours of the skull were correlated with aptitudes, abilities, and personality traits. While phrenology has understandably fallen into disrepute, Gall's notions about locationism actually presaged the direction and research foci of much of the 'real' brain science that followed.

In the 1960s and 1970s, the locationist view found one of its strongest voices in the work of the neurologist Norman Geschwind (e.g., Geschwind 1979; Geschwind & Galaburda 1985a, 1985b, 1985c). Geschwind not only delineated regions of the cortex by function, but described pathways taken in the execution of certain language-related behaviors. For example, he states (1979:111) that 'lesions in the angular gyrus have the effect of disconnecting the systems involved in auditory language and written language.' He also asserts that

> in [Wernicke's] model the underlying structure of an utterance arises in Wernicke's area. It is then transferred through the arcuate fasciculus to Broca's area, where it evokes a detailed and coordinated program for vocalization. The program is passed on to the adjacent face area of the motor cortex, which activates the appropriate muscles of the mouth, the lips, the tongue, the larynx and so on.

Geschwind's position, then, was that linguistic behaviors are anatomically and functionally localized and that cortical regions subserving language are connected to one another in highly specifiable ways. Some qualification is required however. According to Geschwind (1979:112), although 'the partitioning of linguistic functions among several sites in the cortex is ... supported by much evidence, the rigidity of these assignments should not be overemphasized'. A related point is made by Banich (1997:53) who notes that a locationist interpretation may be more appropriate for certain cognitive functions, such as language, than for others, such as 'certain aspects of memory' which may be more diffusely represented. Still, the belief that language is anatomically localizable has been a powerful one, and it pervaded much of the research in neurolinguistics in the mid-20th century.

For example, a locationist approach is evident in the early work of Penfield and Roberts 1959 who used electrocortical stimulation — the application of low-voltage currents to the cortex via electrodes placed on its surface during neurosurgery — to induce transient aphasic arrest. (During many neurosurgical procedures, the patient is awake, facilitating the assessment of linguistic functions intraoperatively; however there are newer variants of this procedure which permit electrocorticographic analysis post-operatively [Ojemann 1994].) With this procedure, Penfield and Roberts mapped the cortices of approximately 200 patients.[3] Results revealed well-defined cortical regions that yielded aphasic arrest, usually in response to stimulation in the left hemisphere. These regions were the posterior portion of the third frontal convolution, a larger region in the posterior temporal and inferior parietal lobe, and an area in the mid-saggital fissure, which Penfield and Roberts characterized as Broca's, Wernicke's and the supplementary speech areas, respectively.

In 1978, Ojemann and Whitaker utilized electrocortical stimulation to map the language areas of two bilingual patients. Their comments, and of course the procedure they used, clearly reflected a locationist view of the brain. They state (1978:409) that 'in most people, the cortical language zones include portions of the left hemisphere surrounding the Sylvian fissure, particularly the posterior inferior frontal lobe and posterior temporal lobe'. However, they also note that the precise extent in any one individual to which specific brain areas are involved in language remains a matter of controversy. Nonetheless, a major and still oft-cited finding in this study bears mention: Although Ojemann and Whitaker's patients had different language backgrounds and neurological pathologies, they exhibited similar patterns of language organization as exhibited in their performance on naming tasks in their two languages during electrocortical stimulation. That is, in both patients, naming in the second language was impaired over a wider area of cortex than was naming in the first. Ojemann and Whitaker interpreted this as evidence of more diffuse representation of the second than of the first language.

The belief that language functions, and indeed specific languages, can be associated with certain brain regions was a pervasive one, and it still finds compelling support from clinical evidence. This is dramatically demonstrated in the performance of an aphasic patient (DL) examined over a course of years by the present author. This patient had, as a consequence of a stroke, undergone left-hemisphere damage and had right-sided paralysis (hemiplegia). He exhibited Broca's-like symptoms primarily manifested as non-fluent agrammatic speech. Below are samples of his writing (Figure 1) and drawing (Figure 2) produced years after the onset of his aphasia and after extensive language therapy. (Prior to his stroke, DL had been a noted architect and had been an artist by avocation.)

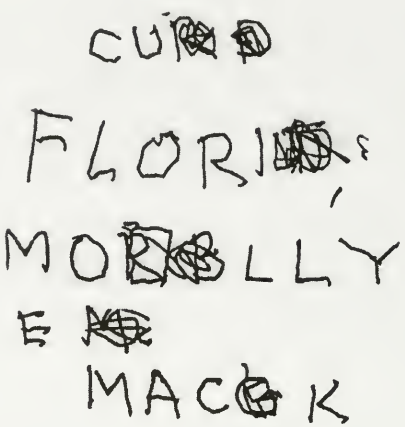

Figure 1: Attempts by DL, at approximately twelve years after the onset of aphasia, to write the words *cube*, *Florida*, *Molly*, and *Mack*, dictated to him by the present author. He had considerable trouble writing the words so the author assisted by spelling them aloud. Note that DL's first attempt to write the letter <l> was <r>. Perhaps revealingly, these letters are acoustically similar when pronounced. (Both represent liquids). And, in response to hearing the sound of the letter <m> when *Mack* was spelled to him, DL wrote <E>, presumably reflecting the initial vowel sound when the letter <m> is pronounced. (This was just after he had successfully written the <M> in *Molly*, and reveals an inconsistency typical of much of his performance.) Since DL was right-handed and had right hemiplegia, he had to use his left hand for all manual tasks.

Evidence of the often remarkable specificity of functional impairments subsequent to brain damage (as graphically demonstrated in the figures above) no doubt contributed, particularly in the 1970s, to growing interest in the neurosciences and linguistic sciences in the laterality of functions in the human brain (see, e.g., Geschwind 1979). In fact, one could easily argue that at least several of the dominant research paradigms of the period from 1950 to 1980 involving the brain/language relationship were devoted to the study of cerebral laterality. Accompanying the increase in attention to laterality was an emphasis on left-hemisphere specialization for language.

Figure 2: A watercolor depicting a pastoral scene with a covered bridge, painted by DL after the onset of aphasia. According to reports by his wife, such paintings required hours of laborious effort, in part because they had to be rendered with his non-dominant hand. The contrast between DL's orthographic/linguistic and artistic abilities is quite obvious and strongly suggests differential localization of function for the abilities involved.

2.3. Language and the 'left brain'

Although the cause of the evolutionary development of cerebral dominance for language remains disputed (MacNeilage et al. 1993; Provins 1997; Lieberman 1998), clinical evidence has revealed that, for most right-handed individuals (about 95%), the left hemisphere subserves major language functions. It also does so for most left-handed individuals, although with a slightly smaller frequently (about 70%). In fact, for many years, the left hemisphere was termed the 'dominant' hemisphere while the right hemisphere was believed to play a negligible or ancillary role in language. (In fact, Penfield [1965] refers to the right hemisphere as the 'uncommitted cortex'.)[4]

Even into the 1980s, Geschwind was ardently discussing the brain from a perspective in which the left hemisphere was deemed solely or largely responsible for language (e.g., Geschwind and Galaburda 1985a,b,c). Moreover, the now-common use of the term, 'left brain/right brain' belies a belief that the cranium houses two DISTINCT brains, and it reflects a popularized interpretation of laterality (e.g., 'Are you a left-brained or a right-brained person?'). In truth, the left-brain/right-brain dichotomy over-simplifies the extent to which the two hemi-

spheres interact during language processing and other cognitive functions; it ignores the fact that under certain conditions the right hemisphere can exhibit a 'left-hemisphere' processing mode (Trope et al. 1992); and it underestimates the role of the right hemisphere in language use (Code 1997).

Nonetheless, the view that the two halves of the brain possess different capabilities (the left hemisphere being specialized for analytic and sequential processing and the right hemisphere for holistic and parallel processing, for example) has been captivating and abiding. (See Springer & Deutsch 1993 for an excellent overview.) It is also one that, especially prior to the 1990s, received substantial attention and support from neurologists and linguists as revealed by some of the prominent research paradigms applied to the study of cerebral functions.

In terms of assessing laterality and its relationship to the organization of language, the queen of all tests was, in the 1960s and 1970s, a non-invasive technique developed by Doreen Kimura called dichotic listening. This technique proved extremely popular because it was non-invasive and could be used in an experimental rather than clinical setting (and, perhaps to its detriment, by linguists with little or no training in neurology). Through the simultaneous presentation of competing stimuli to either ear — such as the presentation of the word *one* to the right ear and the presentation of *nine* to the left — it was believed that dichotic listening and its visual counterpart, the tachistoscopic presentation of stimuli to the left and right visual hemifields (Caplan, et al. 1974; Soares & Grosjean 1981), could reveal the extent to which various types of stimuli were subserved by the right or left hemisphere.

Specifically, Kimura (1961, 1967) found that among patients with left- or right-temporal-lobe damage, as well as among normal subjects, stimuli presented to the right ear were generally reported more accurately than those presented to the left. This finding emerged if the stimuli had certain acoustic properties and the magnitude of the effect was related to the types of linguistic stimuli used. For example, stop consonants were found to yield a fairly strong right-ear advantage (Blumstein et al. 1975), while some types of musical sounds resulted in a left-ear advantage (Kimura 1964; Gordon 1980), and vowels produced a weak or unreliable ear advantage (Blumstein et al. 1975). Kimura and scores of others who administered dichotic-listening tests thus concluded that this technique provided an excellent method for determining not only which hemisphere was dominant for language, but to what extent, under what testing conditions and task demands, and with what types of stimuli and subjects (e.g., Van Lancker & Fromkin 1978; Springer & Searleman 1978).

Not surprisingly, the dichotic listening test grew rapidly in popularity and application (see the extensive review by Berlin & McNeil 1976) and continued to be used even to test the now-refuted hypothesis that language is lateralized differently in monolinguals and bilinguals (e.g., Albert & Obler 1978; Vaid & Lambert 1979). However, as Zatorre 1989 indicates, some dichotic tests lacked methodological rigor and their results may have been unreliable or invalid. For example, what appear to be laterality effects may, in some cases, be nothing more than

a reflection of attentional bias favoring one or the other ear (Bryden et al. 1983). Thus, in recent years, this approach has been used less extensively than it was its heyday of the 1970s (see however Bruder 1991; Yund et al. 1999) and is now rarely interpreted as providing an unambiguous view of cerebral laterality.

Another non-invasive approach, the measurement of brain waves as detected by electrodes placed on the scalp, was also applied to the study of cerebral laterality (e.g., Donchin et al. 1977; Molfese 1978; Molfese & Schmidt 1983). One application of this method, the electroencephalogram (EEG), was used to measure alpha wave activity — low-frequency waves whose amplitude is inversely correlated with activity. Thus, the more activation, the less the alpha-wave activity. With this approach, researchers concluded that the left hemisphere was more highly activated than the right during verbal tasks (Galin & Ornstein 1972.) It is important to note that, in later years, substantial improvements were made upon this method, primarily involving the repeated presentation of similar stimuli so that averaging techniques could be utilized, as is done in a procedure using event-related potentials (ERPs). The ERP maps 'regularities in external stimuli or events onto the regularities in brain activity time-locked to those events', and these regularities 'are mirrored, in part, in the modulations of electrical activity' displayed visually as waveforms (Kutas & Van Petten 1994:83). Although, as Garnsey 1993 notes, not all of the processing that takes place in the brain is observable in ERP waveforms, ERPs are still used by some researchers in evaluating hemispheric effects (Kutas, Hillyard, & Gazzaniga 1988; Neville et al. 1997), and they remain a valuable source of information about how the brain deals with linguistic information (e.g., Kounias & Holcomb 1994; Kutas & Van Petten 1994; Gevins 1998).

Concurrent with the emergence, in the mid-20th century, of the dichotic-listening technique and the measurement of brain-wave activity was a neurological procedure, the Wada test. This test provided particularly strong support for the belief that the left hemisphere was dominant for language (Wada 1949; Wada & Rasmussen 1958). In this procedure, a barbiturate (sodium amytal) is injected into the carotid artery prior to neurosurgery in order to determine to what extent the left (or right) hemisphere subserves language. Injection of the drug into the artery results in a temporary anesthetizing of the hemisphere ipsilateral to the artery. If the anesthetized hemisphere controls language, the patient becomes temporarily mute. This test, which generally yields robust effects, served as a major source of data regarding the relationship of handedness to the lateralization of language (at least in the spoken mode) and it is still in use (Berthier et al. 1990; Ravdin et al. 1997; Wada 1997).

The mid-20th century also witnessed the application of another medical procedure that permitted researchers to investigate cerebral laterality (Sperry et al. 1969; Levy et al. 1972; Sperry 1974, 1982). That is, neurologists, psychologists, and linguists examined the behavior of commissurotomized or 'split-brain' patients — patients who had had part or all of the corpus callosum (and in some cases other commissures) severed to alleviate intractable epileptic seizures. (The corpus callosum is a major tract of millions of nerve fibers connecting the cortices

of the two hemispheres.) This procedure yielded highly informative results about the specialized functions of the two hemispheres since it effectively prevents the hemispheres from communicating with one another via the cortex. For example, a commissurotomized patient might be unable to name an object, placed out of view, which he/she is palpating with the left hand: The sensory information is relayed to the right hemisphere subcortically but cannot be transmitted via cortical connections to the left hemisphere for production as a spoken word. Nonetheless, the patient KNOWS what the object is, as can be demonstrated if he/she is asked to draw it. Split-brain patients thus revealed the extent to which language is subserved by the left hemisphere and provided valuable information about the linguistic abilities of the disconnected hemispheres. Indeed, although the right hemisphere has at least some linguistic abilities (e.g., Zaidel 1978; Kutas et al. 1988; Hutner & Liederman 1991), the behavior of commissurotomized patients revealed significant left-hemisphere dominance for most language functions. It also demonstrated that the two hemispheres subserve different albeit highly complementary functions — an observation supported by a considerable body of subsequent research (e.g., Code 1997; Vargha-Khadem et al. 1997; Karbe et al. 1998; Kurowski et al. 1998).

If one could imagine a technique particularly well suited for providing information about the differential functions of each hemisphere, it would perhaps involve the absence of part or all of one half of the brain. Indeed, since the 1970s, such situations have been the topic of considerable interest and research and have appeared as a consequence of a surgical procedure, a hemispherectomy, in which much or all of one hemisphere is removed. (Removal only of the cortex is called 'hemidecortication', although many researchers apply the term 'hemispherectomy' to the removal of the cortex or to the removal of a much more substantial portion of one hemisphere.) A procedure as radical as this is only undertaken in cases of severe brain pathology or damage, as for example, in Sturge-Weber-Dimitri syndrome (Dennis & Whitaker 1977) or Rasmussen encephalitis (Stark et al. 1995; Caplan et al, 1996). These and certain other neurological disorders may cause intractable epileptic seizures for which hemispherectomy may be the only means of obtaining partial or complete relief. In the 1970s, reports of patients (usually children) who had undergone such procedures generated particular interest because they provided relatively direct evidence of the capabilities not only of the disconnected hemispheres, as with 'split-brain patients', but of the capabilities of entirely isolated cortices or hemispheres. For example, Dennis & Whitaker (1977:102-3) observed that, of the three children whom they examined, the two who had undergone removal of the left hemisphere exhibited 'difficulty in utilizing the syntactic information conveyed by words like *when*, *after*, and *before*, and in analyzing examples of overt instrumentals, ... especially those in which the surface word order was not the same as the temporal order of the action'. By contrast they found that 'the isolated right hemisphere appear[ed] to acquire certain components of auditory language less well, especially the ability to respond to the structural or syntactic aspects of heard utterances'.

However, as compelling as these results were (and continue to be), inferences about normal brains (and hemispheres) based on hemispherectomized patients must be made with care. That is, hemispherectomies are undertaken only in cases of severe brain pathology so, prior to surgery, certain functions otherwise subserved by the impaired hemisphere may have been reallocated to the intact hemisphere. In addition, brain pathology is not always confined to one hemisphere or, subsequent to the removal of a hemisphere, there may be a shift of the remaining hemisphere over the midline and a concomitant enlargement of the lateral ventricle (Strauss & Verity 1983:2). Finally, removal of one hemisphere may result in the amelioration of presurgical glucose hypometabolism (Caplan et al. 1996) or in the disinhibition of functions in the remaining hemisphere. In any of these situations, post-operative behavior may not accurately reflect the abilities of a normal hemisphere in an intact brain.

In sum, the mid-20th century was an era rich with hypotheses about and methods for analyzing brain structure and function. And, by the beginning of the 1980s, work in the neurosciences had provided fertile ground for the emergence of fresh perspectives and new research paradigms relevant to the future of the linguistic sciences.

3.0 Back to the future: Recent and emerging developments

Nearly thirty years ago, Noam Chomsky (1972:1) commented about interdisciplinary efforts involving linguistics when he observed that there were signs 'that the rather artificial separation of disciplines may be coming to an end. It is no longer a point of honor for each to demonstrate its absolute independence of the others'. He also said that 'there is more of a healthy ferment in ... the particular branch of cognitive psychology known as linguistics ... than there has been for many years'. Chomsky's observations may have be been somewhat premature (see, e.g., Mack 1990), but they are now applicable to the blossoming relationship between the neurosciences and linguistic sciences. (This is not to overlook productive interdisciplinary work by linguists in other areas — for example, by those who have applied theoretical models from linguistics and cognitive science to the study of second-language acquisition [e.g., Flynn 1987; White 1990] or those who have used neurological constructs to inform language pedagogy [Danesi 1988]. However, discussion of such work is beyond the scope of the present paper.)

That is, concurrent with a virtual explosion of information about the human brain in recent decades, there has been a marked increase in inter- and multidisciplinary initiatives involving inquiries into the brain and language. One example of this was a weekly seminar held in the spring of 1998 at the University of Illinois under the auspices the University's Center for Advanced Study. Entitled 'Mind, Brain, and Language', this seminar was designed to explore ways in which the neurosciences (and the behavioral sciences) could inform theory and research in the linguistic sciences — and vice versa. Students and faculty from twelve academic units engaged in an exchange of information on selected topics from language evolution and child-language acquisition to computational modeling and

brain-imaging techniques. The culmination of this endeavor was a major conference devoted to the topic of mind, brain, and language. These initiatives, and others occurring worldwide, reveal a growing recognition of the fact that much of the 'cutting-edge' work in the neurosciences and linguistic sciences is now occurring at the interstices of once-insular (and insulating) disciplines.

It is therefore of interest to consider those areas in the neurosciences that are currently proving particularly rewarding in terms of informing the linguistic sciences and which, in so doing, are blurring or even erasing the lines between traditionally defined academic disciplines. These include the following topics and approaches: biologically based maturational effects upon language acquisition, the modularity of language, brain-imaging techniques, and the bilingual brain.

A. Youth is NOT wasted on the young: Biologically-based maturational effects on language acquisition

While individual differences in the structure and function of the brain have long been recognized, the systematic study of such differences has been particularly vibrant since the early 1980s. (See, e.g., Hartlage & Telzrow 1985.) Dean (1985:9) describes this work as follows:

> The study of individual differences with its foundation in biology is concerned more directly with 'naturally' occurring variation in behavior and brain function than differences observed through manipulation of the examination of neuropathology. ... The objective ... is the portrayal of variation in brain function that can more heuristically be attributed to an interaction of genetic and environmental factors.

Indeed, in recent years, researchers have explored individual differences in work dealing with the effect of genetic and environmental factors on behavior. For example, some researchers have examined handedness (Gur & Gur 1980; Herron 1980; Witelson 1980; Basso et al. 1990; Murphy & Peters 1994; Driesen & Raz 1995), while others have investigated gender (Wittig & Peterson 1979; McGlone 1980; Kimura 1983; Pizzamiglio et al. 1985; Habib et al. 1991; Shaywitz et al. 1995; Witelson et al. 1995). Results of such studies have revealed interesting and sometimes controversial findings about the brain/behavior relationship and about the possible effects of genetic versus environmental variables.

Yet one type of individual difference that has generated an enormous amount of attention is age or, more specifically, the relationship between brain maturation and language acquisition. Many researchers have explored this relationship by testing the critical-period hypothesis (CPH) for language acquisition, and some have sought to provide neurological explanations for such a period. Although the notion that there is a critical period for language acquisition is not new, it continues to generate a great deal of interest and debate and it is a topic ripe for neurolinguistic investigation.

The concept of a critical period, originating from work in embryology and ethology, is based upon the premise that there is a circumscribed period of time in the development of an organism during which it must be exposed to specific ex-

ternal stimuli or internal events if it is to develop normally. In addition, it has been proposed that a critical period should have an observable onset and offset and a specifiable duration (e.g., Mack 1997). Empirical investigations of the CPH have been conducted for years, as exemplified by Stockard's 1921 study of fish embryo, the oft-cited work of Lorenz 1937 on bird imprinting, and Hubel and Wiesel's acclaimed studies with the visual system of cats (e.g., Hubel and Wiesel 1963, 1970). Work such as this and the work of many others (see, e.g., Bornstein 1987) has amply demonstrated the existence of critical periods in animal studies. What remains disputed is the extent to which evidence based upon animal ontogeny is relevant to human behavior — specifically, to the acquisition of language. But before proceeding, it is important to clarify several points.

First, the term 'critical period' is often used interchangeably with the term 'sensitive period', and some researchers use the latter term when others would use the former (e.g., Bateson 1979). A general convention, however, is to use the term 'critical period' to denote a period that ends abruptly and 'sensitive period' to denote one that ends gradually. But it is quite difficult to operationalize 'abruptly' and 'gradually'. For example, a 24-hour period of susceptibility to environmental influences would certainly seem to qualify as one that ends abruptly. Yet if that 24 hours represents 80% of the life span of the organism involved (as in an insect responding to pheromones in a mating cycle), the ending of the period might well be interpreted as gradual. In other words, 'abrupt' and 'gradual' are relative terms — a point almost never made in discussions of the CPH. Therefore, it seems more reasonable view a critical period as that time during which complete development (of a physical structure or a behavior) is possible, and a sensitive period as that time during which partial development is possible. Because studies designed to test the CPH in language-acquisition research invariably find evidence that at least some language acquisition can occur throughout the life span, the term 'sensitive period' (and 'sensitive-period hypothesis' or SPH) will be used in the present discussion.

Second, it is possible to assert that there are age-based (maturational) constraints on language acquisition without agreeing that these constraints are the consequence of neurobiological factors. For example, some second-language researchers have proposed that adult L2 acquisition is less successful than childhood L2 acquisition for reasons involving social, affective, personality, cultural, testing and/or pedagogical variables (e.g., Snow 1987; Singleton 1989; Brown 1994). Certainly, these variables and countless others contribute in some measure to age-based effects. But, because the focus here is on the role of brain-based language behaviors, maturational constraints are treated as NEUROBIOLOGICALLY based maturational constraints.

On a related note, it is possible to maintain that there are maturational constraints on language acquisition without positing the existence of a critical (or sensitive) period. For example, it might be the case that language proficiency correlates inversely with age at the onset of language acquisition (i.e., the younger one is when he/she acquires language, the more proficient he/she will be) and that an age-based decrement in proficiency is reflected as a linear function. If this were

the case, then acquisition at age 25 should result in better performance than acquisition at age 30, and acquisition at age 35 should result in better performance than acquisition at age 40. But to date, there is little evidence of this.

Finally, no strong distinction is made here between a sensitive period for a first or a second language. A number of studies designed to test the SPH for language acquisition have, in fact, been conducted using the L2 of bilinguals or second-language learners. Of course, there are many ways in which first-language (L1) and second-language acquisition differ. For example, apparent age-related difficulties — if they exist — in adult L2 acquisition may be due as much to transfer from the L1 as to biological constraints on late language learning. But, with the application of appropriate methods for testing and evaluation and the use of large numbers of subjects from different language backgrounds, it should be possible to control or account for at least some of the variance caused by nonmaturational factors.

Some of the earliest observations about a sensitive (or, in their terms, critical) period for language were made by Penfield 1953 and Lenneberg 1967. Both maintained that there were maturationally based constraints on language acquisition, and Lenneberg clearly associated these constraints with neurological variables. However, two of Lenneberg's proposals have not withstood empirical investigation although they are often cited as fact in the literature. These are (1) that the critical period for language acquisition ends at puberty, and (2) that the end of the critical period is correlated with or caused by an increase in the lateralization of language to the left hemisphere. (If there is a critical period, it probably ends much earlier than puberty, at least with respect to certain linguistic components and modalities. Furthermore, it is unlikely that there is a single critical or sensitive period for the entire linguistic system.) But importantly, Lenneberg (1967:176) also conjectures that 'the time limitations postulated for language acquisition' probably do not function 'across the board for all types of human learning'. This is a central premise underlying most studies designed to test the SPH for language acquisition.

There is now such a large body of work on the relationship between age and language acquisition that much of the evidence cited to support the SPH is well known, so examples here will be kept to a minimum. Pertinent studies include the comparative analysis of brain damage in children versus adults (e.g., Robinson 1981); examination of language acquisition and behavior in language-deprived children and adults (Lane 1976; Curtiss 1977, 1994; Newport 1988, 1990; Emmorey et al. 1995; Grimshaw et al. 1998); and examination of neurological functions in individuals whose exposure to language occurred at different ages (Weber-Fox & Neville 1996; Neville et al. 1997, 1998). In addition, inferential support can be found in some psycholinguistic studies of individuals who acquired their L2 at different ages (e.g., Oyama 1976; Patkowski 1980; Johnson & Newport 1989; Flege 1991; Kim 1994; Shim 1995; Flege, Munro, & MacKay 1995; Munro et al. 1996; E. Kim 1997; Mack 1998: Mack et al. 1999). And, as will be considered in Section 3.3., relevant evidence is now emerging from brain-imaging studies of bilinguals.

A frequently cited study regarding the SPH and L2 acquisition was conducted by Johnson & Newport 1989 using 46 native speakers of Korean and Chinese who arrived in the U.S. between the ages of 3 and 39. Subjects were tested on a grammaticality judgment task (GJT) in English. Those who had arrived in the U.S. between the ages of 3 and 7 performed as accurately as did native speakers of English. Those whose age of arrival was 8 to 10 performed less accurately, those who arrived from age 11 to 15 performed even less accurately, and those who arrived after age 15 performed the least accurately. Johnson & Newport interpret their findings as support for the SPH not only because of these findings, but because age was a stronger predictor of subjects' performance than were other variables examined, including duration of exposure to English and attitudinal and motivational variables. The findings of Shim 1995 and E. Kim 1997 who also used a GJT with Korean-English bilinguals differing in age of exposure to English supported the results of Johnson and Newport's study although they observed earlier age-based effects. That is, subjects who were exposed to English as early as age 6 did not perform, in all respects, as did the native speakers to whom they were compared.

In an experiment designed to test the SPH for the phonological component, Mack 1998 and Mack et al. 1999 tested 15 adult English native speakers and 60 adult Korean-English bilinguals who were native speakers of Korean. The bilinguals were divided into four groups of 15 each, based upon age of arrival in the U.S. Subjects were required to discriminate and identify stimuli in computer-synthesized /i-I/ and /u-U/ continua. (These sets of vowels were used primarily because neither /I/ nor /U/ exists in the Korean vowel system.) To control for one potentially major confounding variable, ANCOVAs were used for the data analysis with length of exposure to English as the covariate. Results revealed that all five groups discriminated the vowels similarly, but differences emerged in their identification of the /i-I/ continuum, with only those bilinguals who had been exposed to English between ages 4 and 7 performing as the native speakers did. (No difference in the identification of the /u-U/ continuum was observed possibly because the bilinguals associated the English /U/ with the Korean high back unrounded vowel.) Moreover, partial correlations revealed that age was more strongly correlated with /i-I/ identification among the bilinguals than was duration of exposure to English, Korean proficiency self-rating, or the amount of Korean used in the home. Hence the results are interpreted as support for the SPH for language acquisition.

But there are even stronger sources of evidence for the SPH — and hence for maturationally based constraints on language acquisition — than these psycholinguistic studies of bilinguals. These can be found in studies detailing the language deficits of individuals whose exposure to a native (first) language did not occur until relatively late in life.

The most well-documented of these cases is that of Genie (Curtiss 1977) who, from the age of twenty months to thirteen years, was kept in isolation and received almost no linguistic input. At the time she was discovered and rescued

from her physical and social imprisonment, she could neither produce nor understand language. Yet, in response to intensive language therapy, within several months she could produce at least 100 words and she could combine words in simple utterances. Moreover, according to Curtiss (1994:228), Genie's 'acquisition of lexicon and the expression of meaning relations, including multipropositionality, steadily increased'. On the other hand, 'her utterances remained largely agrammatic and hierarchically flat.' And, Curtiss notes, 'her speech, even after eight years, remained essentially devoid of "closed-class" morphology and of most syntactic devices and operations'. Clearly, Genie did not acquire a complete language system. Most interpretations of her linguistic abilities (or lack thereof) are based upon the notion that Genie's 'window of opportunity' for acquiring language had closed at least partially by the time she was exposed to language.

Curtiss (1994:229) discusses a related case, that of Chelsea, whose language acquisition did not, through an unfortunate set of circumstances, begin until she was fitted with hearing aids when in her thirties. Like Genie, Chelsea was able to acquire lexical items fairly rapidly, but her multiword utterances were 'almost without exception, unacceptable grammatically and quite often propositionally unclear or ill formed'. In contrast to Genie, Chelsea's 'lexical knowledge seem[ed] limited to (denotative) definitional cores and [did] not appear to encompass either subcategorization information or logical structure constraints'. More recently, Grimshaw et al. 1998 presented the case of a hearing-impaired individual who was fitted with hearing aids at a relatively late age (although much earlier than Chelsea had been). The focus of their study was E.M., a young man who had been profoundly deaf since birth. At age 15, he was fitted with hearing aids and was then exposed to Spanish, the language of relatives with whom he resided, in a naturalistic context in the home. Yet, even after he had been exposed to spoken Spanish for four years, E.M. exhibited severe linguistic deficits and his MLU (mean length of utterance) was less than 2. (By contrast, as the authors point out, a normal four-year-old child has a mean MLU of 4.4.)

Taken together, evidence from studies such the above strongly suggests that there are maturational constraints on language acquisition and that there is a sensitive period for language acquisition. (See however Vargha-Khadem et al. 1997 on the acquisition of language by a nine-year-old child after left hemidecortication and Locke 1997 for a discussion of problems with the interpretation of the SPH.) But what how might these constraints be represented at the neurobiological level? At present, speculation must suffice, as the illustration below reveals.

In a recent publication, individuals involved in national policy-making organizations devoted to an understanding of child development stressed the role of neurological changes as they relate to early childhood (Melmed 1997; Newberger 1997). For example, Newberger (1997:5) asserts that, 'if a child receives little stimulation early on, synapses will not sprout or develop, and the brain will make fewer connections. Therefore, a child's experiences during the first few days, months, and years may be more decisive than scientists once believed'. Al-

though Newberger may be correct, she cites no supporting data (for example, from the study of infant and child brains) because the data simply do not exist. That is, to systematically relate numbers of synapses in young human brains to specific amounts of environmental stimulation would require healthy brain tissue obtained post-mortem and prepared for examination with electron microscopy. These samples would be taken from the brains of individuals who had been classified, prior to death, with respect to the amount of environmental stimulation received, such as no exposure to linguistic input, large amounts of linguistic input, etc. (An even better design would entail the random selection and random assignment of subjects to groups whose environmental stimulation was then carefully controlled.) Such a study is theoretically feasible but, especially for methodological reasons, it would be difficult to implement.

In fact, some the best evidence currently available regarding the effect of experience on cellular changes in the brain has been obtained in animal studies (e.g., Greenough 1986; Greenough et al. 1987; Greenough & Black 1992). Greenough and colleagues conducted studies of rats raised in a variety of environments. As Greenough et al. 1987 explain, they studied environmental complexity (EC) rats, social cage (SC) rats, and individual cage (IC) rats. The EC rats were housed with others and had ready access to play objects; the SC rats were housed in small groups or pairs in nearly empty cages; and the IC rats were alone in cages and had no play objects. Morphological examination of the animals' brains revealed that the EC rats had about 20% more dendrites (and hence about 20% more synapses) per neuron in the upper visual cortex than did the IC rats. This amounts to a difference of about 2,000 synapses per neuron. (When one recalls the size and density of neurons, the magnitude of this effect becomes especially apparent.) This type of experience-based change is termed by Greenough et al. (1987:550) to be an 'experience-dependent process' — one characterized by the development of new synapses (synaptogenesis). They contrast this with an 'experience-expectant process' as follows:

> The data ... suggest that there is a fundamental difference between the processes governing the formation of synapses in early, age-locked sensory system development and those governing synapse formation during later development and adulthood. Experience-expectant processes found in early development appear to produce a surplus of synapses, which are then pruned back by experience to a functional subset. In later development and adulthood, synapses appear to be generated in response to events that provide information to be encoded in the nervous system.

Thus the susceptibility of the brain to certain types of extrinsic influence is maturationally based and involves synaptic pruning (elimination of synapses). This may be the neurological substrate of a sensitive period for language acquisition (and one of the reasons why, after childhood, second-language learners almost invariably exhibit an accent in their L2!). While such a suggestion may seem speculative, Greenough et al. (1987:553) make a related point:

> A conjecture that a particular developmental process has a sensitive period(s) (e.g., language acquisition) can now generate testable hypotheses about neural changes that must accompany it. For example, a fixed time course for language acquisition would suggest a peak in cortical thickness of synaptic numbers shortly before the start of a hypothetical experience-expectant period.

This proposed hypothesis provides a compelling argument for the neurobiological study of a proposed sensitive period (or periods) for language and, in fact, finds some empirical support in the work of Huttenlocher & Dabholkar 1997 who studied synaptogenesis in the auditory and prefrontal cortices of fetal, infant, and child brains. Among their major findings were that neither synapse formation nor synapse elimination followed one time course in all regions of the cortex and, in the auditory cortex (but not in the prefrontal cortex) synapse elimination appeared to be complete by the age of 12. They also note that 'synapse elimination, in contrast to synaptogenesis, seems to be ... environmentally related' (117). In this regard, they refer to findings of permanent visual defects resulting from visually deprived input occurring during a period of synapse elimination. It appears then that synapse elimination (as in experience-expectant processes) is a crucial neurological feature associated with sensitive (or critical) periods.

Thus empirical evidence is emerging that may eventually support (or refute) the sensitive-period hypothesis for language acquisition. What is now needed are (1) additional age-based studies to better determine developmental milestones in language behaviors (such as the well-documented early-childhood loss of the ability to discriminate non-native speech sounds [Werker & Tees 1984; Werker 1995]), and (2) the correlation of such milestones with changes in the brain. Results of such studies could also be used to help reconcile apparent discrepancies between the above-cited work and evidence from neuroimaging (see 3.4. below) regarding age-related effects and the brain.

3.2. Einstein's brain: Is there a language module?

Recently, Albert Einstein was featured in news reports on national television, on the radio, and in news magazines. Or, more accurately, Albert Einstein's BRAIN was featured. Sandra Witelson and colleagues have been studying Einstein's brain (kept, in a remarkable act of foresight, by the pathologist who conducted the autopsy after Einstein's death in 1955). Their objective has been to determine if his brain has any anatomically distinct characteristics — characteristics that could be related to the type and or extent of his intellectual abilities.

These researchers found that, while the overall size of Einstein's brain was within the range of the brains to which his was compared, one region in the parietal lobe, the parietal operculum, was absent and the inferior parietal lobule was 15% larger than average (Witelson et al. 1999). This lobule provides for associations across sensory, visual, and somesthetic modalities and has been implicated in visuospatial, mathematical, and 'imagery of movement' cognitive functions. Witelson et al. suggest that its apparent enlargement in Einstein's brain may be causally related to his intelligence and, more specifically, to the way in which Ein-

stein conceptualized scientific problems. In other words, researchers may have discovered the neurological substrates of the theory of relativity.

Of course, proposing a causal connection between neuroanatomy and cognitive function can be problematic. In this case, for example, Einstein's vibrant life-long intellectual activities may have stimulated the development of neural networks (although Witelson et al. indicate that the extensive development of Einstein's posterior parietal lobes probably occurred early in development). It is also possible that the unusual structure of Einstein's brain is an anatomical accident completely unrelated to his cognitive abilities. But, as this discovery suggests, the linking of highly specific brain regions to highly specific brain functions is not only tempting but is, at least in part, warranted on the basis of what has long been known about the relationships between brain structure and function.

Consider again the work of Ojemann and colleagues (Ojemann 1980, 1981, 1983, 1994; Ojemann & Whitaker 1978; Ojemann & Mateer 1979). This work, using electrocortical stimulation to map the relationship between brain regions and language functions, has yielded some provocative results largely supportive of a highly locationist interpretation of language organization and function. For example, Ojemann found that 'at a few sites [in the cortex] only conjunctions, prepositions, and verb endings were altered during stimulation' (Ojemann 1983:71-2). Such an assertion is somewhat difficult to accommodate in light of Ojemann's own acknowledgment of frequently observed between-subject variability in the cortical representation of language (Ojemann et al. 1989; Ojemann 1994). Still his work remains widely cited and has even inspired studies designed to determine whether or not a bilingual's two languages have distinct spatial representations in the brain (e.g., Rapport et al. 1983).

In fact, a related type of cortical mapping is now being used to assist neurosurgeons in delineating brain regions responsible for various functions (Grimson 1999). With this procedure, a transcranial magnetic stimulator with a pair of electomagnets induces electrical currents in specific regions of the brain, such as the motor cortex. Electrical 'pickups' affixed, for example, to a patient's hand can then reveal to what extent muscles respond to cortical stimulation, thereby enabling the surgeon to distinguish brain regions which generate the strongest responses from the more peripheral regions which generate weaker responses. Application of this procedure helps reduce the likelihood of paralysis which could result if core regions of the primary motor cortex were excised during neurosurgery.

Localization of neurological functions is similar, but not identical, to the theory of modularity that gained prominence in the 1980s. A modular cognitive system, as articulated by Fodor (1983:37) is 'domain specific, innately specified, hardwired, autonomous, and not assembled' (i.e., the system has not been 'put together from some stock of more elementary subprocesses'). And, for decades, Chomsky (1972, 1984, 1986) has premised his theories upon a view of the language faculty as modular or 'informationally encapsulated' . He states (1972:70) that 'as far as we know, possession of human language is associated with a spe-

cific type of mental organization, not simply a higher degree of intelligence'. And, in a discussion of Chomsky's theory of language and the mind (and, more specifically, of his conception of the principles of Universal Grammar) Cook (1988:20) says the following:

> It is not at all clear that ... UG [Universal Grammar] principles could operate in areas of the mind other than language. Speakers can entertain mathematical or logical possibilities that [unlike language] are not structure-dependent. ... The language faculty has particular properties that do not belong to other faculties. Further arguments for independence come from language acquisition; principles such as structure-dependency do not appear to be learnable by the same means that, say, children [use when learning] to walk or to do arithmetic.[5]

In recent years, evidence from selectively impaired and preserved language functions has been cited as support for an interpretation of language as a modular system — and one which may be composed of sub-modules. For example, Curtiss (1982, 1988) presents the case of a child who had pervasive mental retardation accompanied by motor, social, and cognitive delay but showed evidence of preserved linguistic abilities. She also cites the cases of three four-year olds, all exhibiting normal conversational abilities but deficits in morphosyntax as revealed in such utterances as, *Him bite mine head off*, *He little than me*, and *Want go show Papa* (1988:89). To account for such evidence, Curtiss 1994 proposes a tripartite model of language comprising a grammatical, referential/propositional, and social/communicative component — each one of which may be selectively impaired or preserved.

Yet modularity has not been embraced by all researchers in the neurosciences and linguistic sciences, as Lieberman (1984:21) makes eminently clear:

> The human brain is a complex, interconnected structure that has a long evolutionary history. It was not designed by a team of engineers who were aiming to produce a device that would operate by using discrete modules that each independently carried out the computations for some cognitive act. The data that have been acquired by neurophysiologists are not consistent with the assumption that the human brain functions by using discrete 'modules' — that is neural devices like a language module, a space perception module, a number system module — that abruptly evolved as Chomsky ... proposes.

Farah (1994:46) takes a related position by using the parallel distributed processing (PDP) framework proposed by Rumelhart & McClelland 1986 'as a source of principled constraints on the ways in which the remaining parts of the [neural] system behave after local damage'. The components of this model, as applied by Farah, are that (1) the representation of knowledge is distributed rather than localized; (2) information is processed in a graded rather than in an all-or-none manner; and (3) the units in the system function interactively rather than in isolation. On the basis of work conducted with McClelland (Farah & McClelland 1991) in which a computational two-component (visual and functional) model of

semantic memory was lesioned, Farah (1994:50) concludes that damage to the visual semantic system results in impairment in the (non-damaged) functional semantic system — a finding contrary to the 'locality assumption'. She provides further evidence, based upon computer models, in support of the PDP framework and, in so doing, concludes that the locality assumption and at least certain interpretations of language modularity are not tenable.

This approach is related to a connectionist model of language (Dell 1985; Elman 1991; Plaut 1995; Nobre & Plunkett 1997). A highly simplified description of connectionism is that it represents cognitive functions, such as language processing, using interactive neural networks. These are activated as a function of the strength ('weights') of the connections among (in some approaches) various types of nodes, such as word or feature nodes. Nobre & Plunkett (1997:263) state that, by demonstrating 'how a high degree of integration can be achieved across disparate knowledge domains', connectionist modeling 'challenges the commonly held assumption that the fractionation of behavior [including linguistic behavior] reflects an underlying fractionation of the brain systems that control such behavior'.

Another point is that while, for some researchers 'modularity' is simply a terminological variant of 'locationism', for others it is deemed particularly insightful because it interprets linguistic deficits within the framework of specific theories of grammar and/or models of knowledge representation (e.g., Rapp & Caramazza 1997; Smith forthcoming). However, it must be emphasized that, as originally formulated, modularity was a theory of the mind, not of the brain. Moreover, the term has been used, sometimes confusingly, in various ways. As Lieberman (1998:109) points out, 'Neurophysiologists often use *module* to characterize a functional neural circuit that carries out a particular task' while linguists may use the term to refer to 'a genetically specified part of the brain that carries out some specific aspect of behavior, such as coding the rules of grammar.' In addition, it is possible that certain cognitive processes may be FUNCTIONALLY modular while being subserved by massively interconnected neural networks.
In conclusion, as Karmiloff-Smith 1992 proposes, a reasonable theory of cognition may ultimately need to encompass both domain-specific nativist and domain-general empiricist interpretations. In such a system, modular and non-modular approaches to knowledge are not treated as mutually exclusive but as complementary. Emerging findings from the neurosciences can help determine whether or not such an interpretation is reasonable and, if it is, how it can be applied to linguistic theory.

3.3. A new window on the brain: Insights from neuroimaging

The past two decades have witnessed an energetic emergence and enthusiastic application of a variety of brain-imaging techniques. (For general overviews and descriptions see Binder & Rao 1994; Raichle 1994; Toga & Mazziotta 1996; Zatorre et al. 1996; Lester et al. 1997.) These techniques have, at last, permitted researchers to obtain high-resolution images of intact brains using relatively non-invasive procedures. Some of these procedures are CT (computerized tomogra-

phy), MEG (magnetoencephalography), SPECT (single-photon emission tomography), PET (positron-emission tomography), NMR (nuclear magnetic resonance) and fMRI (functional magnetic resonance imaging). Capable of providing detailed maps of the brain, these revolutionary techniques have been increasingly used since the early 1980s.[6] This is clearly revealed in the following figure presenting the number of studies in a standard database referring, over a five-decade period, to a once highly utilized procedure — dichotic listening — and to newer techniques involving brain imaging.

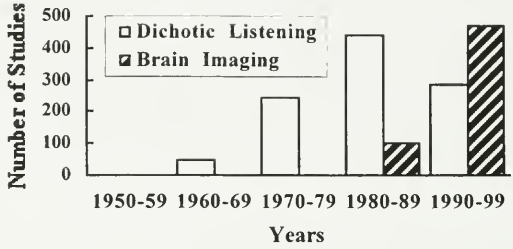

Figure 3: The total number of studies referring to dichotic listening and brain imaging, by decade, found in the PsychInfo database. Note the complete absence of references to brain imaging up to 1980, followed by a dramatic increase from 1980 to 1999. Concurrent with this is a marked decrease, particularly in the past decade, to studies referring to dichotic listening.

One type of 'map', the CT scan (developed in the early 1970s), is obtained by passing a beam of x-rays through the brain (or other tissue) at many angles through a specific plane and then reconstructing the resulting information as a three-dimensional image. Computerized tomography provides information based upon the density of the tissue observed. Thus the CT scan can clearly reveal anatomical features of soft tissue and is particularly well suited for locating brain lesions. Two other scanning techniques, PET and fMRI, have generated particular interest because, by revealing changes in metabolic activity resulting from experimentally manipulated cognitive and behavioral tasks, they can be used for obtaining images of the intact DYNAMIC brain. Put simply, they can take a picture of a resting brain, a thinking brain, a listening brain, a visualizing brain, even an obsessive-compulsive brain.

Specifically, PET utilizes a technique in which (for example) water is labeled with a radioisotope injected into a vein. Certain activities result in an increase of regional cerebral blood flow (rCBF); PET detects the radioactive material and takes multiple pictures of the functioning brain, revealing changes in activity with an accuracy of within several millimeters. (It does, however, have relatively poor

temporal resolution.) Similarly, fMRI scans are generated through, in one method, the detection of small fluctuations in the magnetic properties of oxygen-carrying hemoglobin (Raichle 1994). Thus, fMRI reveals changes in metabolic activity in the brain, and it does so with a high degree of spatial resolution. It can also be combined with a standard MRI so that both structural (anatomical) and functional information is represented. Moreover, because fMRI does not involve the introduction of a radioactive substance, multiple scans can be obtained from one individual resulting in increased precision (Banich 1997). Particularly in the past decade, both PET and fMRI have provided valuable data about how the brain processes language (e.g., Metter 1991; Fiez & Peterson 1993, Klein et al. 1995; Damasio et al. 1996; Habib & Démonet 1996; Stromswold et al. 1996; FitzGerald et al. 1997; Friedman et al. 1998; Zatorre forthcoming).

For example, one PET-based study has recently been conducted by Jaeger et al. 1996 to test competing models of past-tense formation in English. As they state (1996:454) single-system theories posit that both the regular and irregular past tense are handled 'by a single cognitive mechanism or system,' while dual-system theories propose 'that regular and irregular past tense production are each handled by a separate cognitive mechanism or system.' In the latter case, regular past tense verbs could either be generated by rule while irregular past tense forms are stored in the lexicon with their stems (Pinker 1991), or regular and irregular verbs could be generated by two different submodules for each of the rule types (Ling & Marinov 1993). The prediction made by Jaeger et al. is that dual-systems theories entail two processes that are so computationally distinct that they should be subserved 'by functionally different systems' (457).

Thus, in the Jaeger et al. study, subjects read aloud regular and irregular verb stems as well as nonce forms and were required to produce the past tense form of the words. A major finding was that the irregular past resulted in activation of the largest region of the brain (and in the longest reaction times). The authors conclude that their findings are consistent with dual-systems theories and inconsistent with single-systems theories (and connectionist models). Although a subsequent critique of this study (Seidenberg & Hoeffner 1998) claims that it is theoretically and methodologically flawed, the findings are supported in a study of a lexical-decision test with priming administered to aphasics (Marslen-Wilson & Tyler 1997). Regardless of the ultimate interpretation of the status of past-tense formation in English, the use of PET to address this issue represents a valiant attempt to apply neuroimaging in testing competing hypotheses about how the brain processes certain types of linguistic information.

In an fMRI study, Binder et al. 1997 have addressed a somewhat different linguistic topic — namely, the identification of as many of the receptive language regions of the brain as possible, thereby testing the 'classical model' of language localization. Subjects were required to make decisions about two types of auditorily presented stimuli. In one condition, they were to indicate by key press when they heard any sequence of two 750-Hz tones; in another condition they were to indicate by key press which of the nouns presented (all names of animals) designated animals both native to the U.S. and used by humans.

Results revealed extensive bilateral activation, both cortically and subcortically, on the tone-decision task. Areas more strongly activated in the semantic-decision than in the tone task were found almost exclusively in the left hemisphere or right cerebellum, and the researchers observed quite extensive activation of regions in the left frontal lobe — regions 'historically considered responsible for language production' (355). They further conclude that 'left frontal regions may participate in receptive language processing in the normal, uninjured state, playing a "language executive" role in coordinating the sensory and semantic processes occurring in posterior areas' (359). In this case, neuroimaging may provide important information about language organization in the INTACT brain, since these results are not entirely consistent with those obtained from studies of language impairment.

What is apparent from both of these neuroimaging studies, as well as from scores of other related studies now underway, is that functional brain imaging is the preferred research technique (for relating brain structure and function) of the present and the wave of the future. Objections about its application are faint and few. Yet the psychologist, Richard DeGrandpre, maintains that the use of brain scans can 'promote a dangerous institutional bias toward neurological reductionism, ... by implying that any simple physiological correlate of behavior is good evidence of cause' (1999:15). But until the fundamental assumptions underlying the interpretation of brain scans prove invalid, studies using these techniques will continue to proliferate at an exponential rate. The temptation to peer, at long last, inside 'the black box' is simply too great, the technology is too dazzling, and the observations are too exciting for anyone to abandon — or even seriously question — this research paradigm in the foreseeable future.

3.4. The bilingual brain

For years, researchers have been intrigued by the co-existence of two languages in one brain. The questions most often asked are deceptively straightforward: (1) How are a bilingual's languages functionally and/or anatomically organized? (2) How and to what extent are a bilingual's languages kept separate?[7] To date, countless studies using a variety of methodologies — particularly in the fields of psycholinguistics and neurolinguistics — have been undertaken in an attempt to answer these questions (e.g., Paradis 1985, 1987, 1989, forthcoming; Paivio & Desrochers 1980; Rapport et al. 1983; Potter et al. 1984; Mack 1984, 1988, 1989, 1992; 1998; Nilipour & Ashayer 1989; Flege & Eefting 1987; Flege 1993, 1995; Mack et al. 1995; Wulfeck, Bates, & Capasso 1991; Schmidt & Flege 1995; Kim et al. 1997; Mack et al. 1999). Among the most promising avenues of research are the (continued) study of language behavior in bilingual aphasics and the examination of the brains of normal healthy bilinguals using neuroimaging.

Michel Paradis' seminal 1977 description of patterns of language loss and restitution, based upon case studies of 138 bilingual aphasics, was a clear manifestation of over a century of interest in and research on language deficits in bi- and multilingual aphasics (e.g., Ribot 1882; Pitres 1885; Gloning & Gloning 1965; Minkowski 1965; Albert & Obler 1975; Lebrun 1976; Paradis 1977, 1983, 1987,

1989, forthcoming; Paradis et al. 1982; Paradis & Goldblum, 1989; Eviatar et al. 1999; Roberts & Deslauriers 1999).[8] The work of Paradis and others has garned considered attention because it is now clear that information from aphasiology can provide insights into how languages are organized, functionally and/or anatomically, in the bilingual brain.

Specifically, Paradis 1977 identified five basic patterns of language loss and restitution in bilingual aphasics — synergistic (subdivided into parallel and differential), successive, selective, antagonistic, and mixed. He describes these as follows (1989:117):

> Recovery is said to be parallel when both (or all) languages are similarly impaired and restored at the same rate; differential when impairment is of a different degree in each language relative to premoribd mastery; successive when one language does not begin to reappear until another has been maximally recovered; antagonistic when one language regresses as the other progresses; selective when patients do not regain the use of one or more of their languages; and mixed when patients systematically [but inappropriately] mix or blend features of their languages at any or all levels of linguistic structure.

As of 1989, Paradis had described three more types — alternate antagonistic, differential aphasia, and selective aphasia. An alternate antagonistic pattern is characterized by the patient's temporary and alternating inability to produce one or the other of the two languages. In differential aphasia, the patient exhibits symptoms typical of one type of aphasia in one of the languages and of another type in the other language. (See however a reanalysis of this type in Paradis 1998.) Selective aphasia occurs when a patient has 'obvious impairments in one language without any measurable deficit in the other(s)' (Paradis 1989:117).[9]

In an attempt to account for the observed patterns of language deficit and preservation in bilingual aphasics, Paradis 1987, 1998 has posited four hypotheses, each of which makes different claims about the neural substrates underlying the bilingual's languages. These are the Extended System, Dual System, Tripartite, and Subset Hypotheses. Paradis (1998:47) maintains that, of the four, only the Subset Hypothesis is compatible with all patterns of bilingual aphasia (as well as with 'unilingual phenomena') reported to date. This hypothesis is based upon the premise that 'each language constitutes a subsystem of the larger cognitive system known as language, in the same way that various registers constitute subsystems of the overall language competence of an individual'. And 'each subsystem can be selectively impaired by pathology'.

On the other hand, Paradis frequently takes pains to distinguish between the functional and anatomical organization of language. For example, in discussing selective language impairment in a trilingual patient, he maintains (1987:342) that 'selective impairment does not necessarily suggest different anatomical substrates for the representation of two languages'. To illustrate, he cites a case of selective aphasia in which only one of the patient's three languages exhibited aphasic symptoms postoperatively. This language recovered spontaneously, yet

one of the previously unimpaired languages then became impaired. He observes, 'It is unlikely that the two affected languages exchanged location over this period'.

Green's 'inhibitory control model' 1986, 1993 can account for such a selective type of impairment, for it proposes the following:

> Two classes of resource [are] identified: excitatory resources which can be used to increase the activation level and inhibitory resources which can be used to decrease the activation level. In producing or comprehending speech, resources are used up and unless they are replenished the system will fail. One effect of brain damage, or other stressors, is to reduce the availability of resources. According to the framework, individual performance is constrained by the availability of resources to effect the control of activation levels (1993:262-3).

Paradis similarly accounts for a pattern of language loss such as the one described above using the 'activation threshold hypothesis'. This hypothesis proposes that the ability to perceive or produce a linguistically meaningful unit may be impaired not due to its complete absence, but due to the improper functioning of neural networks responsible for activating traces left (in this case) by linguistic experience. The advantage of Green's and Paradis' hypotheses is that they can account for impaired language behavior in bilinguals, such as inadvertent mixing of the languages, as well as the behavior of normal bilinguals, such as volitional code-switching. Still it must be acknowledged that some aphasias — in any type of language user — are due to a substantial loss of neural tissue. In such cases, regions subserving language may be destroyed to the extent that no amount of activation or resource allocation can compensate.

It should also be noted that some researchers initially proposed that at least one of the bilingual's two languages might be subserved by, or actually located in, the right hemisphere (e.g., Gloning & Gloning 1965; Albert & Obler 1978). Such separation of the two languages would help explain, for example, the observed loss or preservation of (only) one of the languages in some bilingual aphasics. However, such a gross anatomical distinction in the neural representation of the two languages has not been supported by recent studies (e.g., Rapport et al. 1983; McKeever & Hunt 1984; Berthier et al. 1990: Chee et al. 1999). Indeed, most now believe that a bilingual's two languages are subserved by the same hemisphere (usually the left) and that interesting neurologically based features of bilingual language organization will be observed as intra- (rather than inter-) hemispheric differences or similarities.

In light of admitted difficulties associated with 'locating' language in the brains of bilingual aphasics (see, for example, the excellent discussion by Zatorre 1989), it is not surprising that neuroimaging is now being used, with increasing frequency, to help address fundamental questions about the neurological substrates of language in the INTACT bilingual brain.

An already notable neuroimaging study has recently been conducted by Kim et al. 1997. Its objective was to determine if, among bilinguals, age at the on-

set of the acquisition of the two languages affects the cortical representation of those languages. Thus, using fMRI, these researchers compared the extent of spatial separation of the languages in bilinguals who had acquired both languages in infancy (termed 'early bilinguals') and in bilinguals who had acquired their first language in infancy and a second language in adolescence or early adulthood (termed 'late bilinguals'). The regions examined were the 'classic' language areas — Broca's area in the inferior frontal gyrus (Brodmann's area 44 and, for one subject, areas 44 and 46) and Wernicke's area in the superior temporal gyrus (Broadmann's area 22). Spatial separation was operationalized as the center-to-center distance in millimeters (mm) between centroids of activity as measured during linguistic tasks carried out in the subjects' two languages. To minimize artifacts resulting from head movement, yet to engage subjects in a language-based task, the researchers had the subjects use internal speech in each of their two languages to describe, without vocalizing, what they had done at a specified time the previous day.

Results revealed no difference in the distance between the center-of-mass centroids in Wernicke's area for the two languages of the early and late bilinguals, with the mean amount of spatial separation being 1.6 mm for the early bilinguals and 1.9 mm for the late bilinguals. But a substantial difference was observed for the two groups in Broca's area. Here the mean amount of spatial separation was 1.5 mm for the early bilinguals and 7.4 mm for the late bilinguals. These researchers conclude that, at least with respect to Broca's area, the early acquisition of two (native) languages may result in the use of a common language area responsible for phonetic processing and may render the two languages relatively impervious to subsequent neural modification. On the other hand, late acquisition of a (second) language may necessitate the utilization of additional cortical tissue since, presumably, language in the core area cannot be reorganized.[10] These results obtained regardless of the handnesses or gender of the subjects, and across a variety of language pairs examined. (They are also reminiscent of the findings obtained in the electrocortical stimulation study of Ojemann & Whitaker 1978.)

Related results have been obtained from other neuroimaging studies of bilinguals. For example, in their pilot fMRI study of five multilinguals, all of whom were fluent in a native and second language but non-fluent in a third, Yetkin et al. 1996 found that the largest regions of fronto-parietal and frontal lobe activation were associated with speech production in the third (non-fluent) language. And the smallest regions of activation were associated with speech production in the two fluent languages. (For all subjects, the non-fluent language had been used for fewer than five years and was not, at the time of testing, used regularly.) Thus, for the two fluent languages, the regions of activation appeared to be more centralized.

Although not designed to evaluate the extent of cortical involvement in a bilingual's two languages, an fMRI study conducted by Schlosser et al. 1998 also yields indirect support for the notion that a more familiar language results in stronger activation of frontal brain regions than does an unfamiliar one. They provided fourteen subjects with auditorily presented sentences in English (the

subjects' native language) and in Turkish (a language which none of the subjects understood). While the English sentences produced strong left-superior sulcus activation in all subjects, the Turkish sentences evoked no coherent pattern of activation in any of the subjects.

Based upon these studies, it seems that language fluency — as reflected in age of language acquisition, years of language study and/or use, and language familiarity — is a crucial determinant of the neural representation of the languages of a bilingual. This conclusion finds at least indirect support in the work of Perani et al. 1998 who carried out a study, using PET, of high-proficiency early and high-proficiency late bilinguals. They found that, regardless of age of acquisition, all subjects appeared to utilize the same neural substrates, as reflected in left-hemispheric foci of activation, when listening to stories told in their two languages. A similar finding was obtained by Chee et al. in their 1999 fMRI study of the processing, by 24 Mandarin-English bilinguals, of single visually presented words. They conclude (1999:3052) that 'common cortical areas are activated when fluent Mandarin-English bilinguals perform cued word generation. This is true of early, as well as late, onset bilinguals'. Again, while the bilinguals differed in age of L2 acquisition, all used English and Mandarin on a daily basis and all were characterized as fluent in both languages.

Clearly, brain-imaging studies designed to reveal the functional representation of languages in the bilingual brain have a promising future. These should prove especially revealing when their results are combined with data obtained from other approaches such as the study of aphasia in bilinguals.

In 1953, Uriel Weinreich presented a linguistically based model of 'languages in contact' by proposing three ways in which a bilingual's language systems could be related to one another. He classified these as Types A, B, and C. For example, Type A would obtain if the bilingual had two separate representational systems for units in each language, Type B if there were two shared systems, and Type C if one system were subserved by or mediated through another. These types later came to be known as coordinate, compound, and subordinate bilingualism, and numerous studies were conducted to compare the psycholinguistic performance of, for example, coordinate and compound bilinguals. Weinreich's typological constructs now appear naively simplistic. Moreover, the terms 'coordinate', 'compound', and 'subordinate' have fallen out of use, in part because they are difficult to validate empirically (at least as originally formulated). Yet analysis of the organization of the bilingual's two languages is as warranted today as it was nearly fifty years ago. All that is required is a simple emendation of one of the questions underlying Weinreich's work. That is, in addition to asking, 'How are a bilingual's two languages represented as LINGUISTIC systems?' researchers can now ask, 'How are a bilingual's two languages represented as NEURO-FUNCTIONAL and NEUROANATOMICAL systems?' Answers are already appearing on the horizon.

3.5. Y2K and beyond: Other developments

Three decades ago, Roman Jakobson — insightful, creative, and prescient — stated that 'the deepest discernment of the relation between the human organism and its verbal abilities and activities is achieved by the mutual help of NEUROBIOLOGISTS [sic] and linguists in a comparative inquiry' (1971:688). A major objective of the above discussion of new and emerging issues and techniques has been to demonstrate the importance of such 'mutual help'. Thus four particularly promising areas of research have been discussed — areas in which the neurosciences have informed, and are likely to continue to inform, the linguistic sciences. These include maturational effects on language acquisition, language modularity (and connectionism), neuroimaging techniques, and the bilingual brain.

Yet as important as each of these is to the future of linguistics, this is hardly an exhaustive list with which one can march confidently into the new millennium. Other topics which may prove particularly fruitful in the coming years are these: (1) continued study of the role of genetic versus environmental factors in child language acquisition; (2) additional examination of the contribution of the right hemisphere (as well as subcortical and cerebellar structures) to language use; (3) application of techniques involving neurogenesis — the growth of new neurons — in older brains (once thought an impossibility) to human brains; and (4) determination of the extent to which research in Artificial Life (the computational modeling of cognitive processes as biological phenomena) can provide insights relevant to theories of language development and evolution.

4. Conclusion

In the Introduction above, some of history's more blatant misconceptions about the role of the human brain were presented. Given the complexity of the brain's functions and the extremely small scale of its basic building block, the neuron, it is hardly surprising that ancient philosophers and physicians had major misconceptions about what the brain does and how it does it. Indeed, as Crick (1994:3) points out in his book, *The Astonishing Hypothesis*, each of us is 'no more than the behavior of a vast assembly of nerve cells and their associated molecules', a fact that went unrecognized for thousands of years.

Nonetheless one of the ancients did, at least in part, get it right. In a commentary attributed to Hippocrates, glimpses of an early understanding of the function of the brain are clearly revealed:

> The source of our pleasure, merriment, laughter and amusement, as of our grief, pain, anxiety and tears, is none other than the brain. It is specially the organ which enables us to think, see and hear, and to distinguish the ugly and the beautiful, the bad and the good, pleasant and unpleasant (Lloyd 1978:248).

Thus, even more than 2,000 years ago, 'the father of modern medicine' recognized the remarkable function of the 'vast assembly' residing inside the head. It is now axiomatic that without the brain there can be no emotion, thought, or lan-

guage and that, without an UNDERSTANDING of the brain, there can be no complete understanding of emotion, thought, or language.

Also considered above have been selected developments in the neurosciences which have had a significant impact on the linguistic sciences. Information from the neurosciences has been emerging at an ever-accelerating rate, relegating Jakobson's 1973 observation that 'so far, almost nothing is known about the internal network of verbal communication' to the dustbin of history. Thus, although one author states that 'faculty members have long been blissfully ignorant about the folks in the building next door' (Nelson 1998:3), most linguists are not only aware of the folks in the building next door (in this case, the neuroscientists) but are happy to have them as neighbors.

Moreover there is now an increasing awareness of the importance of cross-disciplinary interaction among a variety of fields, as Edward O. Wilson makes clear in his book, *Consilience: The Unity of Knowledge*. Borrowing from William Whewell's 1840 work, *The Philosophy of the Inductive Sciences*, Wilson maintains that intellectual inquiry must be based upon 'consilience' or the 'jumping together' of knowledge across disciplines. He even advocates a grand theory of knowledge which entails no less that the unification of the sciences and humanities.

Whether or not Wilson's 'grand theory' will be realized, it is apparent that, although the Decade of the Brain is drawing to a close, coming decades will witness a plethora of new discoveries and insights from the neurosciences. And some of these discoveries and insights will provide answers to abiding questions about how language is organized and how it functions in the brain. Yet, as this new age of interdisciplinary exploration dawns, the words of the noted author Arthur Koestler (1967:254) come to mind: 'Once a scientist loses his sense of mystery, he can be an excellent technician, but he ceases to be a *savant*.' It is hoped that, even as researchers in the neurosciences and linguistic sciences cast about in seas roiling with new information, hypotheses, models, and theories, they will retain a sense of mystery about the human brain — and about how language at once inhabits, shapes, and reflects our remarkable 'universe within'.

NOTES

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[1] Interestingly, Galen was not only an accomplished physician, but a philosopher and logician who discussed the concepts of ambiguity and fallacy, and who had a theory about spoken and written language (Edlow 1977).

[2] Examination of aphasia in terms of Broca's and Wernicke's aphasia is known as the 'classical view' of aphasia. Yet it has long been known that (1) there are several to many other types of aphasia depending upon one's classification criteria (Doody 1993); (2) pure forms of Broca's and Wernicke's aphasia are relatively rare; and (3) at least for Broca's aphasia, 'the underlying pathology is ... extensive and varied' (Alexander et al. 1989:676). Thus, although this basic dichotomous typology is still widely cited and utilized, its inherent limitations must be acknowledged.

[3] It should be noted that cortical mapping using electrocortical stimulation was not done capriciously. Mapping was originally conducted prior to the excision of areas believed to be causing epileptic seizures, permitting a 'safer and more exact' cortical excision (Penfield & Roberts 1959:107), although its value in mapping the language areas soon became apparent.

[4] Moreover, it has long been recognized that the two hemispheres of the brain are anatomically asymmetical and that, in most individuals, the planum temporale is larger on the left than the right (Geschwind & Levitsky 1968; Witelson 1977; Kertesz & Naeser 1994) — a feature which may be related to left-hemisphere specialization for language.

[5] Structure-dependency, one of the first principles proposed in the UG approach, is based upon an interpretation of how elements of a sentence are moved. For example, to form a passive sentence, the direct object is moved to sentence-initial position (*Jane loves cats* → *Cats are loved by Jane*). This movement necessitates knowledge of the structural relationships among lexical items rather than the sequence in which they occur. For example, there would never be a rule (in English or any other natural language) such as, 'To form the passive, move the n^{th} word in the sentence to sentence-initial position.' It must be noted that movement rules have undergone substantial re-evaluation and reformulation in the past several decades, although this example still sufficies for illustrating the nature of principles in UG.

[6] Magnetic resonance imaging is derived from a technique called nuclear magnetic resonance imaging (NMR) which yielded its developers, Felix Bloch and Edward Purcell, a 1952 Nobel Prize. Less than two decades later, Allan Cormack and Sir Dogfrey Housfield received a Nobel Prize for their work on the CT. Clearly, the development of enhanced *in vivo* imaging techniques represented a major milestone in the neurosciences — one whose importance was appropriately recognized by the scientific community.

[7] In the present discussion, the term 'bilingual' is used to denote a individual who is reasonably fluent in two OR MORE languages. (See Mack 1997 for further definitions pertaining to bilingualism.)

[8] For extensive reviews of the literature also see Paradis 1977, 1989, and Albert & Obler 1978; for selections from primary sources on the topic see Paradis 1983; and for discussion of the limitations of cross-linguistic research in aphasia see Bates et al. 1991.

[9] In fact, Paradis' 1987 *Bilingual Aphasia Test* has been administered in over 60 language pairs to thousands of bilinguals worldwide and is now yielding significant findings about language loss and restitution in bilingual aphasics.

[10] In a seemingly prescient observation about the organization of language in the brains of bilinguals, Pitres (1895:895) states that '*on pouvait supposer que, le pied de la troisième circonvolution frontale contenant la totalité de l'appareil utilizé par l'acquisition de la langue maternelle, le reste de cette circonvulution restait libre pour l'acquisition des autres langues*'. That is, he surmised that a portion of the third frontal convolution, a region in Broca's area, is allocated for the 'mother tongue' (native language), while the remainder is free for the acquisition of other (non-native) languages — a conclusion remarkably similar to that drawn by Kim et al. 1997.

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HUMAN-MACHINE COMMUNICATION BY VOICE

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One way to gain an understanding of natural spoken language is to derive a constructive theory of it by building a language engine. The more nearly this artificial language engine simulates human linguistic behavior, the more of language it may be said to explain. A constructive theory of language must have two important features. It must capture known linguistic structure and it must express this structure in an elegant and computationally tractable mathematical framework.

Complete constructive theories of language do not yet exist. However, interesting ones do exist and there is reason to hope that they will improve. This paper describes the state-of-the-art in automatic speech synthesis and speech recognition and explains some of the mathematical models on which their underlying theories rest.

1. Introduction

The motivation for this article is the need for engineers and linguists to collaborate. In particular, the topic on which the two disciplines have mutual interests is spoken dialog between humans and machines. It is immediately apparent that the construction of machines that produce and understand natural spoken language is a holy grail for electrical and computer engineers. It is further obvious that the science of linguistics has a great deal to say on the subject. Linguistics offers not only technical advice on precisely what human-machine dialog entails, but also theoretical considerations of the architecture of the human language engine. This view of the collaboration might be interpreted as simply a consultation in which engineers have much to learn and little to teach. Fortunately, the collaboration may legitimately be seen as mutually beneficial. The very thought of building a machine capable of speaking and understanding speech is nothing less than a constructive theory of language. The more nearly the attempt succeeds, the more light it sheds on the linguists'central questions.

Indeed, there have been some successful collaborations between linguists and engineers on this very topic. Unfortunately, these collaborations have been fragile and thus have not achieved their promise. Here we explore some of the joint efforts and suggest ways in which they can be less fragile and more effective.

With respect to the problem of human-machine communication by voice, engineering and linguistics make the following contributions. Engineering offers

the mathematics and physics required to make quantitative models of the processes involved in speech communication.

Linguistics provides detailed qualitative descriptions of the structure and usage of language.

While these insights are certainly necessary to a scientific understanding of language, they cannot be applied blindly. Engineers must realize that mathematical models, no matter how elegant and sophisticated they may be, are useful only to the extent that they capture the essential structure of the phenomenon under consideration, in this case, spoken language. On the other hand, the linguist's taxonomy of structures and usages, rules, and examples, no matter how exhaustive, are merely annecdotal evidence and, as such, of limited value unless they can be embedded in a rational computational framework.

These characterizations will, no doubt, be criticized as simplistic and stereotypical.

Linguistics is sometimes rigorous and quantitative. Nor is Engineering always brute force calculation. The best way to see some of the subtleties is to examine some case histories. In particular, it is useful to consider the state-of-the-art in text-to-speech synthesis (TTS) and automatic speech recognition (ASR). As used here, TTS refers to the process of generating an acoustic speech signal without regard for its meaning. The generated speech should be intelligible to a human listener, sound natural, and convey useful information, all despite the fact that the generation process has no means to represent semantics.

Similarly, ASR is intended to refer to the inverse process, that of transcribing speech into text without regard for meaning. It is expected that the accuracy of transcription should be nearly perfect, independent of speaker and topic.

It is not at all certain that these problems, as stated, can be solved. In fact, it is not even clear that, were they solved, the solutions would be of any practical value. The debate, of course, hinges on the absence of semantic processes in both cases. Some research efforts have acknowledged these difficulties and have addressed the more complex problems of speech synthesis from concept and automatic speech understanding. For the purposes of exploring the interaction of engineering and linguistics, it is not necessary to consider these additional complications.

2. Speech Synthesis

The best example of a collaboration of linguistics and engineering is that of speech synthesis from text. The state-of-the-art in TTS is quite advanced. Speech synthesizers can read absolutely any text with a high degree of intelligibility in several different voices. The naturalness of the voices is quite good but would never be mistaken for a human voice by even the most naive of listeners. Strangely enough, TTS has been less of a commercial success than its companion technology (ASR), even though the latter is technically far less proficient.

Speech synthesis is far more intuitively comprehensible than is ASR. The generation of sound was well understood by ancient musicians and the analogy of musical instruments to the vocal apparatus led, as early as the 18th century, to mechanical speaking devices (von Kempelen 1791).

As for translating the written word to a sequence of sounds, anyone taught to read phonetically finds the concept quite natural.

The mechanical embodiment of these ideas is shown in the diagram of Figure 1 (van Santen & Sproat 1998). It is understood that all of the processes indicated in the figure are carried out on a digital computer.

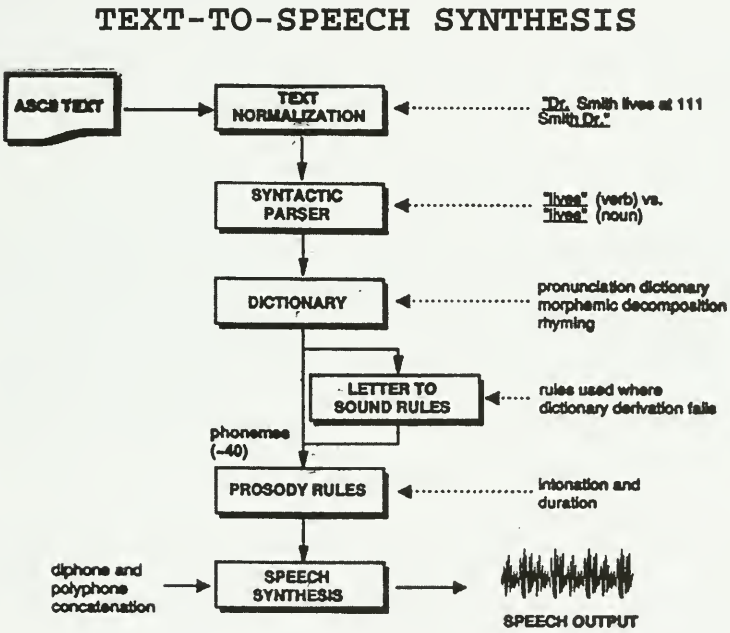


Figure 1.

The first five of the processes account for the transliteration of standard orthography into its phonetic equivalent. These processes taken as a whole represent, very possibly, the best compendium of the linguist's knowledge of phonetics, phonology, phonotactics, morphology, and prosody. The last box represents the engineer's best understanding of the physics of sound generation in the human voice apparatus.

The details of the operation of this system are instructive. The conversion of graphemes to phonemes, although it spans several levels of linguistic structure, is virtually monolithic, namely table look-up. The tables are large pronouncing dictionaries. Thus text normalization is simply a list of abbreviations, acronyms,

counting numbers and non-alphameric symbols along with their usages and pronunciations.

In text normalization as well as lexical access and syntactico-semantic analysis, there are always ambiguities that affect pronunciation. For example, *Dr.* can be pronounced as *doctor* or *drive* (as in an address). The word *bass* will be pronounced differently when it means a fish or a stringed instrument. And, of course, *read* will be pronounced differently when it is present or past tense.

All of these issues are resolved by the same mechanism, concordances based on the information-theoretic property of mutual information. The mutual information between two words is the negative binary logarithm of the ratio of their joint probability to the product of their prior probabilities. Thus when two words are likely to appear together they have high mutual information. The words with which a given word has high mutual information determine its usage, hence its pronunciation and/or its prosodic features. For example, if *Dr.* appears with a numeral it should be pronounced *drive*. If *bank* appears with *river*, it should be unstressed. There are, of course, vast numbers of such ambiguities in natural language. The mutual information coefficients needed to resolve them are computed exhaustively from large textual corpora.

In addition to the primary lexical and syntactico-semantic analysis described above, there is a secondary syntactic analysis required. This is a crude parse used to find phrase boundaries which, in turn, are used to assign pitch contours and accents. Note that a full syntactic parse into parts of speech is not required.

The phonetic and phonological analyses are also largely accomplished by table-look-up. First, however, a morphological analysis must be performed to make the table-look-up more efficient. The rule-based morphological analysis decomposes words into their base forms and their inflections thereby reducing the number of entries needed in the pronouncing dictionary.

Unfortunately, it is not practical to store the pronunciations of all morphemes. To account for this, two alternate methods of phonetic analysis are provided. The first is to use a pronunciation of a morpheme that rhymes with the missing one. The second is a set of letter-to-sound rules. Such rules are not reliable and thus are used only as a last resort.

Once the phonetic pronunciation has been determined from the dictionary, phonological analysis is performed. In order to understand how this is accomplished as a table-look-up, it is first necessary to recall that the acoustic/phonetic units are actually sequences of allophones called polyads. There are about 2500 such units stored as sequences of frames of linear prediction coefficients excised from natural speech (Olive et al. 1998). The phonology is implicit in the selection of the units. That is, the units are selected to give the broadest coverage of the phonology of the entire language. When synthesizing fluent speech, a morpheme is realized by selecting the sequence of polyads that most closely matches its phonological context. The selection of the inventory of polyads is carried out automatically by an optimal algorithm.

Finally, after a sentence or paragraph has been analyzed with respect to phonetics and phonology, the suprasegmental prosodic features are superimposed. That is, each of the frames, i.e. LPC vectors, of each polyad is marked immediately with pitch, intensity, and duration. Acoustic synthesis follows by conventional LPC methods. The parameters of the synthesizer may be adjusted to produce different stereotypical voices.

It is appropriate to comment here about the mathematics of the acoustic synthesis procedure. The method of linear prediction was originally derived for the purpose of analyzing time series such as sunspot activity (Yule 1927). When so used, linear prediction is nothing more than brute-force curve-fitting with no underlying model. However, it can be shown (Wakita 1973) that the abstract mathematics has a very interesting interpretation, namely, it is the solution to the linear wave equation in a hard-walled tube of varying cross-sectional area. Here, then, is an excellent example of mathematical analysis working well in linguistics, because it captures a fundamental property of the phenomenon under consideration.

The method of synthesis described above is, for obvious reasons, called concatenative synthesis. One might be tempted to object that it is not true synthesis, because it is really just a sophisticated recording device which reproduces speech as sequences of brief stored segments. An alternative method called articulatory synthesis addresses this criticism by synthesizing speech directly from the physics of an articulatory model (Figure 2) (Coker 1976) without any prerecording of any kind. Using the very same linguistic analysis as outlined above, as you might guess, the resulting synthetic speech, while intelligible, is of far worse quality than that generated by concatenative methods.

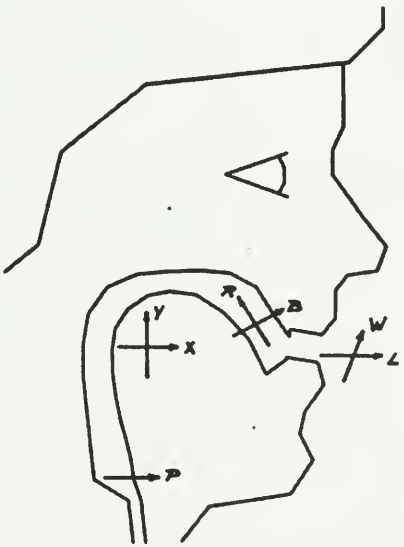


Figure 2.

In summary, then, speech synthesis can be accomplished by a careful, detailed, exhaustive encapsulation of linguistic knowledge in 'dictionaries' of various kinds constructed by well-chosen mathematical analysis. This significant technical accomplishment is the result of an ideal collaboration between engineers and linguists. Based on that joint accomplishment, one may dare to hope that the problem of articulatory synthesis will also be solved.

3. Speech Recognition

The practice of speech recognition does not present so cheerful a picture as does speech synthesis. The state-of-the-art is not nearly as advanced and the interaction of engineering and linguistics not nearly as cooperative. The result is best described as an engineering tour-de-force with a condescending tip of the hat to linguistics. Still, the status quo is instructive.

First, we must admit that for machines, as for people, listening is harder than talking (both literally and figuratively). In the case of synthesis, we need only produce one voice, whereas in recognition we must accept any voice. In the earliest work on recognition of acoustic patterns, little attention was paid to the high degree of variability in the speech signal. In fact, quite the opposite was true. The foundation of ASR, which lies in the seminal work of Visible Speech (Potter, Kopp, & Green 1968), is essentially a catalog of the 'invariant' spectrographic features of speech. The early electronic devices for ASR were based on capturing these 'reliable' features (Dudley & Balashek 1958). However, in the 1960's, the emphasis shifted from cataloging and recognizing invariant features to characterizing speech as a stochastic process and using highly developed mathematical techniques for detection, estimation, and classification to analyze it (Sebestyen 1962). This transformation set up an almost insurmountable barrier between linguists and engineers that stands to this very day. Little information flowed across this barrier in either direction. However, the descriptive aspects of linguistics were accessible to some engineers, while the rigorous mathematics of engineering were of little concern to linguists. Happily this situation is now beginning to change.

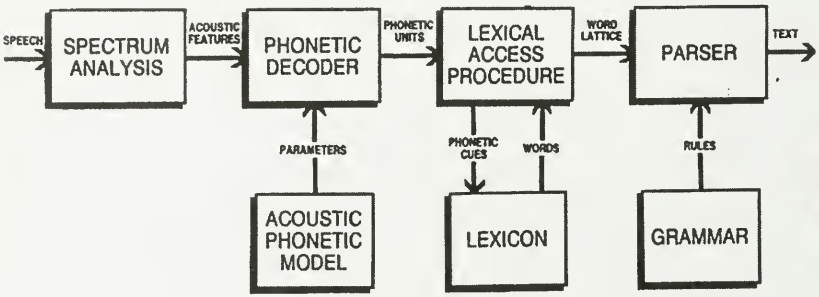


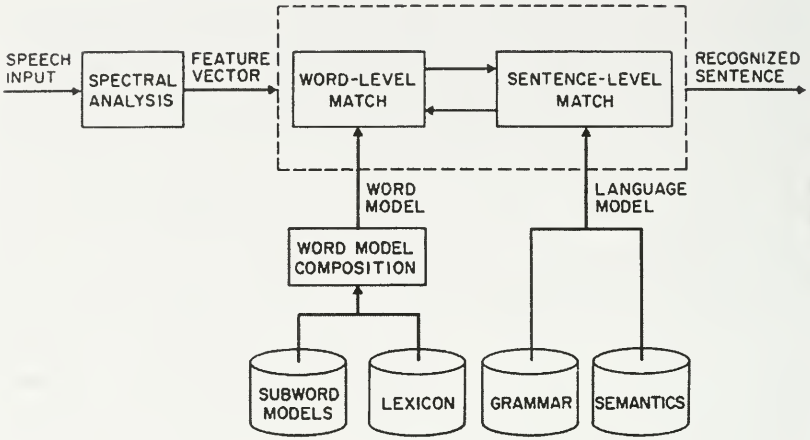
Figure 3.

Skipping over the early history of ASR, let us look at the modern state-of-the-art. Today, large vocabulary recognition of fluent speech is accomplished by systems of the architecture shown in Figure 3. The interesting thing about this diagram is that linguists could have drawn it two or three decades ago. Unfortunately, they had no tools with which to implement it. The earliest attempts at an implementation were based on compiling an exhaustive list of rules for acoustic/phonetics, phonology, phonotactics, morphology, and syntax. These rules were applied by an ad hoc logical mechanism and followed by another ad hoc decision strategy to choose the best transcription for the utterance. The basic strategy is outlined in Newell et al. 1973, but no working version of the proposed system was ever constructed. In the absence of a rational mathematical framework, no amount of linguistic knowledge, regardless how detailed and comprehensive, can enable transcription of fluent speech. The problem is one of combinatorics. A large collection of heterogeneous rules is required. The rules have significant interactions with each other. The number of dependencies amongst the rules grows exponentially with the size of the rule set. No ad hoc procedure can ever be designed to apply and test these rules in an optimal, yet computationally efficient, way. And so, the early programs failed with linguists often blamed.

In the early 1970's, the mathematical technique known as Hidden Markov Modeling was applied to speech recognition (Baker 1975, Jelinek 1976). The mathematics was known a decade earlier but, once again, it is especially appropriate to speech analysis because it naturally captures many aspects of linguistic structure.

Unfortunately, the engineers and mathematicians who applied the methodology to ASR, did so in a very clumsy way which uses the HMM to capture only the statistical structure of the speech signal. The early implementations of the HMM rested on the observation that speech is a quasi-stationary process, i.e., one in which the statistics of the signal are nearly constant over intervals of from tens to hundreds of milliseconds in duration. The hidden states of the HMM were therefore identified with the quasi-stationary regions. In order to force all aspects of linguistic structure to conform to this single notion, the system architecture of Figure 3 was revised as shown in Figure 4, in which all levels of linguistic structure are combined uniformly into a single vast HMM.

In order to accomplish this compilation, one assumes that all phonetic units (phonemes) have three parts, an onset, a steady state or target, and a decay. These are represented by a three-state non-ergodic HMM. It is further assumed that phonology is accounted for by triphonic variation, that is each phonetic unit is influenced only by its immediate predecessor and successor. A different HMM for each phonetic unit is generated for each such phonetic environment. Finally, phonotactic structure is imposed by allowing only those sequences of phonetic units that appear in valid word sequences. A valid word sequence is one whose trigram probability is non-zero.



Overall block diagram of subword unit based continuous speech recognizer.

Figure 4.

The result of these assumptions is a huge HMM with millions of parameters whose values are automatically estimated from hours of unlabeled (i.e., unsegmented) speech of many different speakers. It is another engineering tour-de-force that such a model can be built.

Even more impressive is the fact that the method works vastly better than its early rule-based ancestors. In fact, for vocabularies of tens of thousands of words, fluently read speech of almost any speaker (i.e., native speaker of American English) will be transcribed with 90% accuracy. Considering that the transcription is performed without any knowledge of the meaning of the utterance, this result is remarkable.

4. Conclusion

As noted earlier, this method works because it is based on linguistic structure, albeit highly oversimplified. The lesson that engineers learned from their success was that rudimentary linguistics embedded in a powerful mathematical framework is all that is required. Linguistic subtleties can be safely ignored.

A more interesting implementation of Figure 3 captures a great deal more linguistic reality. Based on the Cave-Neuwirth experiments (Cave & Neuwirth 1980), it uses the more complex HMM shown in Figure 5 (Levinson 1986). This model is ergodic, with each state corresponding to a unique phonetic unit (allophone). Phonotactics is much more faithfully represented by the state transition matrix and segmental duration is explicitly represented by appropriate probability density functions.

Furthermore, the system retains the modularity implicit in the diagram by using separate but mathematically optimal algorithms for lexical access and pars-

ing, the latter based on a formal grammar of English. One encouraging result of this method is that, unlike the system of Figure 4, this system can produce phonetic transcriptions of words not in the lexicon.

Yet, for all its linguistic sophistication, this method yields the same performance as the single HMM technique. True enough, this system is more amenable to the addition of linguistic structure, but its observed behavior is not appreciably better, even though from a psychological and linguistic perspective, it is much more natural.

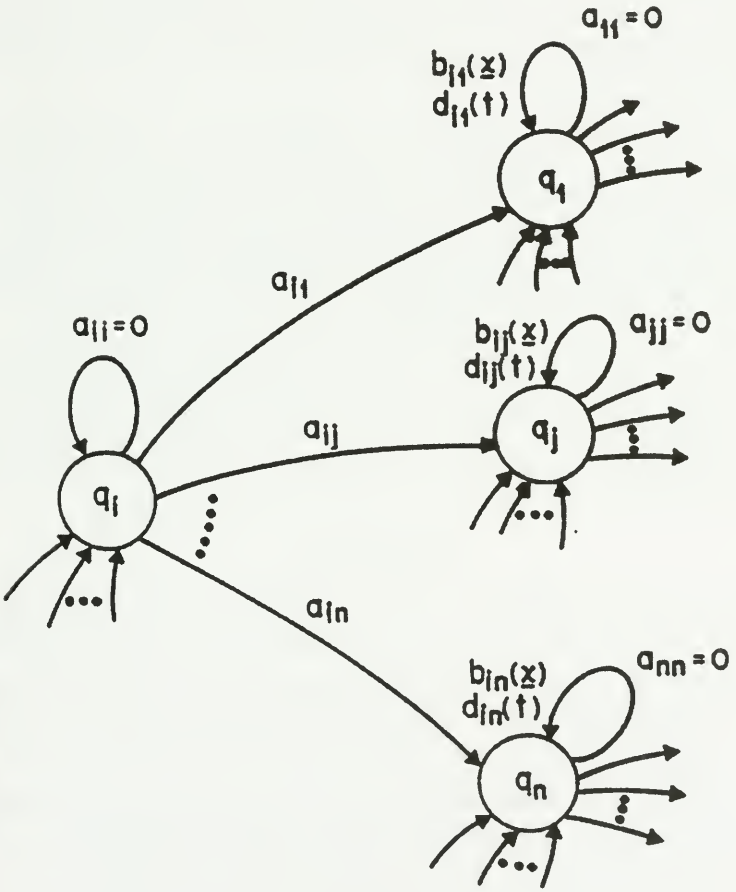


Figure 5.

This disappointing fact is easily explained. Neither system displays anything even remotely approaching human linguistic abilities. There is no morphological

analysis, no prosodic analysis, and syntax is taken to mean only word order. Thus, there is no bridge to semantics, let alone an actual semantic analysis.

Thus there is hope for the future. Good linguistic theories for all the missing structures appropriately represented in a computationally rigorous, but tractable model will lead to the holy grail of automatic speech recognition at human-like levels of performance.

I have tried, over the past many years, to effect this kind of a research effort with little success. The impediments seem to be the following. Engineers are very proud of their recent accomplishments. Most feel that incremental improvements to existing systems will ultimately produce the desired result. I have argued against this sentiment (Levinson 1994) but it is hard to do in the face of the failure on the part of many engineers to recognize how amazing, robust, complex, and versatile natural language truly is.

On the other hand, linguistic theories often seem rather esoteric relative to the practical questions engineers ask. Furthermore, it often appears that linguistic theories stand or fall on the basis of carefully contrived anecdotal examples. As insightful as these may be, an ASR system requires an exhaustive collection of such theories to completely cover all linguistic phenomena. This often requires long and boring labor. Even after all the work is done, some parsimonious representation (probabilistic) must be devised.

And then, supposing progress could be made toward building an ASR machine. Many linguists would argue that such a machine would be a very narrow expression of linguistic theory and would not address the most important questions linguistics poses. I, of course, am a strong advocate of 'constructive' linguistic theories, and it is my fervent hope that some deep and honest introspection can reconcile these differences to the advantage of both disciplines.

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Session III:

Curriculum Design for Linguistic Purposes

Chair: Ladislav Zgusta

Saturday, 31 October 1999
1:00 p.m. - 5:00 p.m.

Studies in the Linguistic Sciences
Volume 28, Number 2 (Fall 1998)

LINGUISTICS IN A COMPUTATIONAL WORLD

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Linguists are talking about computers. What's up with that? What role do computers and computation play in linguistics in 1999? How are we currently using computational tools in linguistic research and in the linguistic curriculum? What about the job market for our students? I'd like to use this paper (a very faithful summary of a talk given at the Symposium *The Linguistic Sciences in a Changing Context* at the University of Illinois's Center for Advanced Study) to take a very brief glance at what's going on, computationally speaking, in the linguistic world. I'll begin with some high-level thoughts about the role of computation in linguistic research, past and present, turn to the job market, and then discuss computation in the classroom, both for general linguistics and for computational and corpus linguistics. I'll use examples from my experience at Boulder, and so the topics will be biased toward my own areas; the reader should of course fill in their own experiences. This paper is meant to start a discussion, not to provide a solution.

1. Computation in linguistic research: The computer as tool

The computer has been most obvious in linguistics in its role as a research tool. This is especially true in phonetics. Instrumental phonetics and laboratory phonology rely heavily on the computer for easy access to waveforms, spectrograms, spectra, and pitch traces, things which until recently had to be done on specialized equipment. The availability of digitized speech corpora has also played a role in laboratory phonology, making it easier to develop and apply theories like TOBI. Such signal analysis software packages are now widely used on PCs, Macs, and UNIX platforms, although no one software tool runs on all three platforms. The computer has also played an obvious role in corpus linguistics. One very successful example of this has been the CHILDES corpus established by Brian MacWhinney (MacWhinney 1995), which has been an essential resource for modern studies in language acquistion.

What future areas of linguistics could be revolutionized by the use of computer tools and corpora? One important role for corpora is in what might be called *interface studies*; research on the interface between linguistic levels. If a corpus is

annotated at multiple linguistic levels, it is easy to ask questions about how a given structure at one level maps to a structure at another level. To this end a lot of recent research in our lab at Boulder has relied on the annotated Switchboard corpus of conversational English telephone conversations (Godfrey et al. 1992). Switchboard is unique first in its breadth: 2400 conversations, 2.4 million words, 200 hours of speech, 500 different speakers. It is particularly interesting, however, in the depth of its annotations; just over half the corpus (1200 conversations) was annotated by the Linguistic Data Consortium and others for:

Sociolinguistic variables (age, sex, and dialect of each speaker)
Speech disfluencies and repairs (Coded by Meteer et al. 1995 using the coding scheme of Shriberg 1994)
Part of speech tags (using the Penn Treebank tagset - LDC)
Dialog acts (using 60 categories such as Question, Statement, Acknowledgement, Backchannel, etc., by Jurafsky et al. 1997)

In addition, selected portions of the Switchboard corpus were coded for more labor-intensive information:

3.5 hours were phonetically hand-transcribed by Steven Greenberg and his team at ICSI/Berkeley (Greenberg et al. 1996).
400 conversations were parsed as part of the Penn Treebank project (Marcus et al. 1993)

The result of this effort has been a number of papers from our lab studying interface effects. For example Gregory & Michaelis 1998 (following Birner & Ward 1998) used the parsed portion of Switchboard to study pragmatic use constraints on syntactic constructions. Because the corpus is parsed, they could automatically select all the instances of topicalization or of left-dislocation to examine for relevant syntactic or pragmatic properties. Jurafsky et al. 1998 and Bell et al. 1999 used the phonetically transcribed portion of Switchboard to study the causes of reduction/lenition in English function words. The rich annotations in the corpus enabled them to show that function words are longer and less reduced when they occur just before disfluencies, when they are less probabilistically predictable, when the speaker is female or elderly, or when they occur turn-initially or turn-finally. Jurafsky et al. 1998b used the dialog-act labels to study the lexical and syntactic properties that characterize specific dialog acts (e.g., the 'micro-grammar' of assessments and of reformulations).

2. Computation in linguistic research: The computer as metaphor.

Computation has also played a less-obvious role in linguistics: as a source of metaphors for processing. Two very salient examples are UNIFICATION and OPTIMALITY THEORY. Unification is the fundamental operation of many modern linguistic theories of syntax and grew out of the convergent ideas of a number of computer scientists and linguistics working in Palo Alto. Martin Kay was working

at Xerox PARC with Ron Kaplan, looking for a way to revise ATN grammars to make them reversible for machine translation. The problem was that the contents of an ATN register could be changed arbitrarily; these changes made reversibility impossible. For example, a parser might place a sentence-initial NP in the subject register, but then move it to the object register after encountering the verb 'be' and a passive participle. Kay began to move toward a view in which registers could not be overwritten, only extended. Essentially he was converging on the idea of logical variables, although without realizing it at the time. Meanwhile, Fernando Pereira and colleagues at SRI International were working on unification in the context of definite clause grammars, a field that arose in computer science out of logic programming. The result of these two computational efforts led to an information-combination operation and to a new way of implementing linguistic knowledge as a set of constraints (Kay 1979, inter alia).

Optimality theory describes the fundamental operation of a recent view of phonology and syntax, and arose from the collaboration of Paul Smolensky (at that time a cognitive scientist/computer scientist) and Alan Prince. Smolensky had been working in the connectionist paradigm, viewing connectionist networks as ways to optimize well-formedness constraints expressed by the network weights. He began looking for an area of cognition that relied on well-formedness; grammar was the obvious candidate. Smolensky and Geraldine Legendre first applied this metaphor in examining how well a linguistic input fit the constraints imposed by a grammar (Legendre, Miyata, Smolensky 1990). Meanwhile, in 1988, Smolensky and Prince appeared together on a panel on 'Connectionism and Psychological Explanation'. Their joint work combined harmony theory and phonology, and was originally called Harmony-theoretic Phonology. At this stage the theory still had numbers (weights) on the constraints. In April of 1991, they replaced the numbers with a ranking scheme. Just as with unification, a new metaphor for the representation of linguistic knowledge arose from the interaction of computation and linguistics

What might the future hold for new computational metaphors in linguistics? A natural candidate for borrowing from computation is learning theory. An important focus of computational models of learning (machine learning) is how to combine bottom-up experiences in the world with top-down learning biases. A simple instance of this process is the PARAMETER SETTING model of learning used in some theories of syntax. Here the learning bias is very strong, and the learner's experience in the world only contributes minimal new information. Outside of linguistics, by contrast, modern theories of learning are based on a weaker learning bias combined with distributional information from the world. Such distributional models have become common in psycholinguistics and computational linguistics, particularly in LEXICAL SEGMENTATION FROM SPEECH (Saffran 1996, Brent & Cartright 1996), GRAMMAR INDUCTION (Stolcke 1994, deMarcken 1997) LEXICAL SEMANTIC LEARNING (Landauer & Dumais 1997, Lund & Burgess 1995), and

PHONOLOGICAL RULE INDUCTION (Gildea & Jurafsky 1996). The learning biases in such systems are varied and come from many sources. Many rely on Minimum Description Length (Brent & Cartright 1996, deMarcken 1997, Stolcke 1994). Woodward & Markman 1991 propose specific word-learning biases. Gildea & Jurafsky 1995, 1996 use phonological Faithfulness. Regier 1997 used non-linguistic (visual) information to bootstrap the learning meanings of spatial prepositions.

Gildea and Jurafsky 1996, for example, studied the problem of phonological rule induction by training a standard automata-induction algorithm to induce the English flapping rule. The algorithm was presented with the surface form of 50,000 words containing a flap, together with the underlying form of each word. They found that the standard algorithm was completely unable to induce the contexts for flapping. They then augmented the learner with a FAITHFULNESS bias that preferred underlying forms to be faithful to surface forms, all things being equal. The addition of this bias enabled the algorithm to successfully induce the English flapping rule.

The Linguistic Job Market

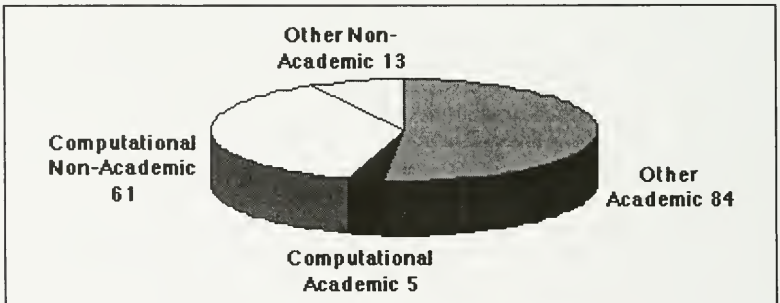


Figure 1: Computation in the Linguistic Job Market

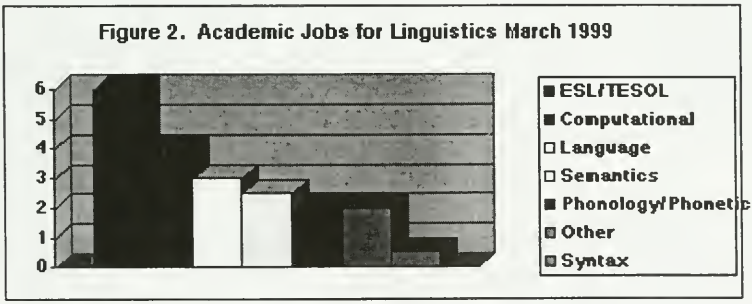
Computation will clearly play an important role in linguistic research. But what about our responsibility to our students? What sort of computational jobs are available to our students, and how should we be preparing them? This section summarizes information on academic and non-academic jobs for linguistic graduates. First, I examined the on-line job listings from the LINGUIST LIST web site (http://www.linguistlist.org) and from LSA's Linguistic Enterprises web site (http://web.gc.cuny.edu/dept/lingu/enter.htm) in October 1998. I divided the jobs into academic/research (requiring Ph.D's; including tenure-track jobs, visiting lectureships, postdocs, and laboratory research jobs) and nonacademic, and into computational (requiring some computational experience more significant than the ability to use a spreadsheet) and non-computational. Figure 1 shows the result:

Over a third of the jobs advertised to linguists required computational skills. A typical Microsoft ad looked for:

> ...a linguist who can take DRT and semantic network outputs from an NL analysis system and provide the automatic inputs to a lower-level text realization component...
>
> Qualifications:
> the analysis of spoken interaction
> interface between linguistic and extralinguistic sources of information
> large-scale knowledge bases such as WordNet
> functional linguistics
> computational linguistics/NLP

A number of jobs looked for computational grammarians or dictionary-developers for foreign languages for speech recognition or grammar-checking.

What of the academic jobs? I looked at the job listings in the March 1999 LSA Bulletin. I coded only tenure-track faculty jobs in linguistics departments in the United States; there were a total of 20 jobs. Again, Figure 2 shows the prevalence of computational jobs.



This large percentage of computational jobs may be temporary, since I had assumed that few linguistics departments currently have computational linguists. In an attempt to check this assumption, I checked the number of departments with a faculty member who is cross-rostered in computer science. This algorithm will produce a conservative estimate, since some computational linguists may not be double-rostered. I found six departments: the Indiana University, the University of Colorado, the University of Delaware, the University of Maryland, the University of Pennsylvania, and the University of Southern California. Since there are also other schools with computational linguists (e.g., Ohio State, UCLA), the number of computational faculty is not insignificant.

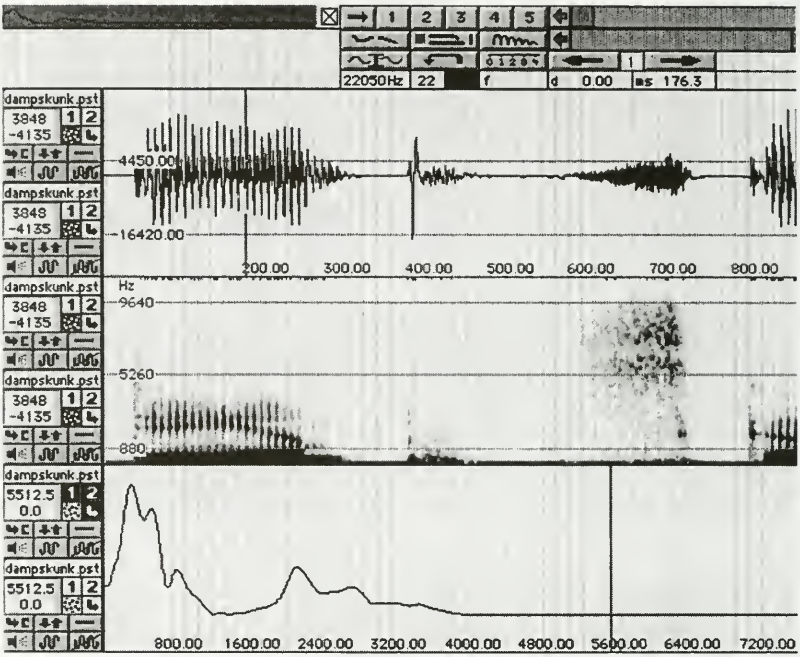


Figure 3. Eric Keller's Signalyze program for the Macintosh, showing a waveform, spectrogram, and spectrum (in the first vowel) of the author saying 'damp skunk' (the final 'unk' is cut off in this picture).

How should we be teaching computation?

If there are computational jobs, and if computation is important in linguistic research, how are we going to add computation to our curriculum? First, computation can be fruitfully used as a pedagogical tool in many linguistics courses that don't focus on computation. Second, we need to add specifically computational linguistics courses to our curriculum.

Let's begin with the first use of computation: as a pedagogical tool. Many linguistic courses have already been transformed through the use of corpora. Many phonetics courses, for example, including our course at Boulder, use Peter Ladefoged's online supplement to *A Course in Phonetics*, which includes Macintosh hypercard stacks for that book as well as the *Sounds of the World's Languages* stacks. This gives students a chance to play sounds from the IPA chart to help them learn them, to practice with performance exercises, and to hear rare phones in their lexical environments. Many phonetics classes also use signal

analysis software as a visualization aid in the acoustics component. We have been using Eric Keller's Signalyze software for lab homework assignments in our undergraduate phonetics class. Using ideas borrowed from John Ohala, we have them record their vowels and plot their own vowel chart, and also have them strip the *s* off of *skunk* to hear (and see) the devoiced *k*, as Figure 3 shows:

Many language acquisition classes, including ours, make use of CHILDES for student homework assignments and projects, as Figure 4 shows.

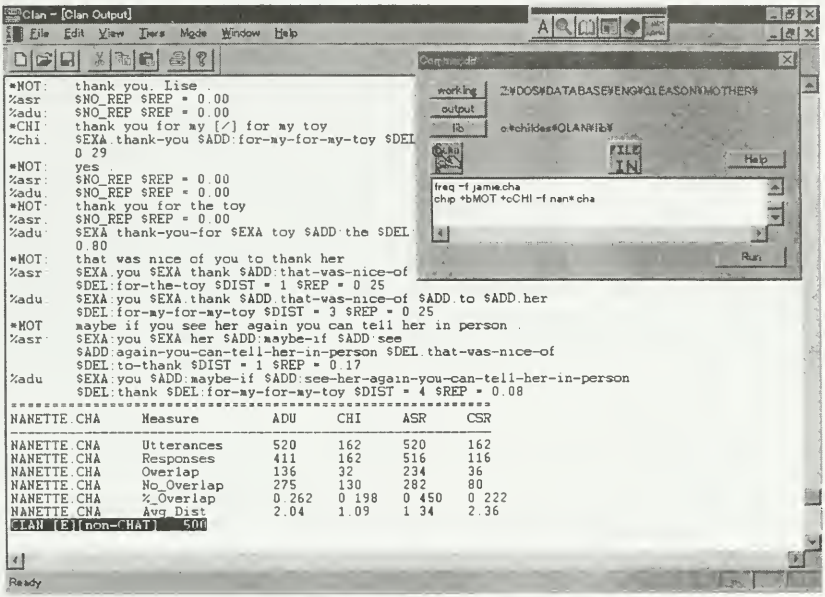


Figure 4. The CLAN program for searching the CHILDES database. This search shows the percentage of repetitions (self- and other-) in child and adult speech in a corpus.

Field methods classes regularly make use of software like SIL's LinguaLinks. We have recently been exploring ways to use web-based dialect vocabulary surveys in our intro sociolinguistics class, and ways to add homework assignments based on parsed corpora to our syntax classes.

Adding computers into the linguistic classroom is definitely not a time-saving device, and is not appropriate for every class. It is important when it can help make a difficult subject (like phonetics) easier to visualize, when it can help beginning students get access to rich data from corpora, and when it can help them exchange data in collaborative classes like Field Methods and sociolinguistics. Another important reason is that the linguistics classroom is an important

place to help overcome the gender gap in computer education, since we have such a good percentage of women students. The American Association of University Women Educational Foundation recently released a report on girls' education, 'Gender Gaps: Where Schools Still Fail Our Children'. They found that in 1996 girls made up only 17% of the high school students who took the Computer Science AP exam, and concluded that:

'While there are more girls taking computer classes, they tend to be in data entry, while boys are more likely to take advanced computer applications that can lead them to careers in technology'

Adding useful and challenging computer homework assignments into the general linguistics curriculum is a way to begin to overcome this gap.

This leads us to the second use of computers in the linguistics curriculum: in computational linguistics courses. Computational linguistics is such a new field that is not completely clear what it constitutes; different departments teach different things. Furthermore there is not yet a standard textbook (although I have high hopes for my about-to-appear textbook with James Martin (*Speech and Language Processing: An Introduction to Natural Language Processing, Computational Linguistics, and Speech Recognition*). Looking at the job market gives us some hint about what's needed:

speech recognition: especially phonetics, statistics, automata theory, programming
information retrieval (Web search engines) data-driven methods, programming
spell-checking and grammar checking – grammar-writing skills, programming
natural language and speech understanding – parsing, discourse and conversation, programming
machine-aided translation – syntax, semantics, use of on-line lexica and thesauri

While most of this is not covered in current courses, there is hope: of the top 20 linguistics departments in the 1995 NRC report, 70% have some sort of computational linguistics course. Most of these cover parsing (top-down, bottom-up, and chart), unification, finite-state automata, and semantic interpretation. The other 30% have a Natural Language Processing course in the Computer Science Department instead. At Boulder we have computational students take a course in Natural Language Processing in the Computer Science Department (taught by James Martin), but that course requires programming ability. This is often true of NLP courses, but should be thought of as a feature, not a flaw. The list above should make it clear that computational linguists must be able to program. Our solution is to use a *Computational Corpus Linguistics* course as the linguistics feeder course in which linguists learn to use corpora, and learn basic programming

techniques using Perl. They are then able to take NLP courses and more advanced corpus, computational, and speech processing classes. This also has the advantage that many students who don't choose computational linguistics as their main area still learn basic programming.

3. Conclusion

Computation will continue to play an important role in linguistics, as a source of new innovations in research metaphors, as a source of new data, as corpora and corpus tools open up new vistas on linguistic phenomena, and as a source of new pedagogical tools. Furthermore, since human-computer interaction via language is the future of computers, our intersection of language and computation will play a more and more central role in our society. It is important for linguistics to invest some time now in deciding how we'd like our curriculum to reflect these changes.

Acknowledgments

Thanks to the Center for Advanced Study and to Adele Goldberg and Jerry Morgan at the University of Illinois at Urbana-Champaign, and to Alan Bell, Michelle Gregory, Lise Menn, and William Raymond for comments on this talk. Thanks to Martin Kay and Paul Smolensky for their time in discussing the history of unification and optimality. Of course any remaining errors are my own.

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LINGUISTICS AND INTERDISCIPLINARY INITIATIVES AT COLORADO: OBSTACLES AND OPPORTUNITIES

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The success of an organization created to further interdisciplinary research, such as Colorado/Boulder's Institute for Cognitive Science, requires more than personal commitment to specific interdisciplinary projects. There must be student, institutional, or external demand for its research, and the people involved must be flexible, willing to work on cross-disciplinary communication, and able to invest their time. Members also need to be perceived as valuable members of their home departments. The structure of the interdisciplinary organization must foster a cooperative culture and allow time for it to emerge. Providing occasions for formal and informal interaction and a fair reward structure are essential; students also need rewards for the extra effort they need to invest in taking nonglamour courses outside their field. Finally, for state institutions, great persistence is likely to be needed in order to overcome obstacles imposed by bureaucratic external governing boards.

Interdisciplinary success begins with personal commitment to specific interdisciplinary projects, so successful projects have to deal with problems that people from different disciplines care about for some reason. But much else beyond that initial personal commitment is needed to sustain interdisciplinary work and make it pay off intellectually. This paper is a reflection on the factors that help or hinder successful interdisciplinary collaboration in research and teaching, based on the experience that the Linguistics Department at the University of Colorado has had over the last decade. Most of the paper will focus on the department's interaction with the Institute for Cognitive Science (ICS) of CU/Boulder. When I speak of an 'institute' below, therefore, I have in mind a structure in which all institute members have their tenure homes in academic departments (linguistics, computer science, psychology, etc.). Their salaries, however, may come through the institute rather than the department.

In preparing this report, I interviewed ICS Director Walter Kintsch, Associate Director Martha Polson, and Bellcore (Bell Research Laboratories) veteran/ICS faculty member Tom Landauer. These conversations indicated considerable consensus, but also revealed several different angles on the issues. Of course, I have also drawn on my own observations and experiences during my eight years at the Aphasia Research Center of Boston University School of Medicine

and my twelve years at Colorado, seven of the last eight of them as department chair. (They gave me some time off for good behavior.)

The presentation below as a list of separate topics is artificial, as each aspect seems to be interwoven with most of the others; under many of the headings there are points that would fit equally well under some other heading. Such resistance to linearization, I suppose, corresponds to my topic itself: how to foster inchoate ideas and help them become thriving research lines.

1. Demand for research and courses

Demand for the output of an interdisciplinary project — such as student demand, institutional demand, or external research funding — is needed for a project to become part of the core of an interdisciplinary program. You need to be able to recognize that there is the potential for such a demand and figure out how to cultivate it. Web pages with guest books seem to be a good way to attract the attention of potential students these days; administrators anxious to leave a mark on the institution can sometimes also be instrumental in obtaining support for a particular type of research.

2. Adaptability

The people involved in an interdisciplinary project have to be flexible enough to abandon the idea of simply 'applying what they know'. Good research partners can't be like the proverbial person with a hammer to whom everything looks like a nail. Therefore, it's important for us to train students to be flexible in their approaches to problems, and to be flexible ourselves. (Example from my own experience in moving from child phonology to neurolinguistics: phonological rules don't work in aphasia like they do in most of child phonology, my original field. Instead, there are statistical tendencies to move towards unmarked syllable structures. If I had had the tools to deal with this fact, perhaps I would have been able to work on aphasic phonology. Instead I had to flex in a different way, and worked on cross-linguistic studies of morphosyntax.) Students shouldn't become 'people with hammers', or even 'people with Swiss Army knives'; instead, they should become capable of adapting existing tools and creating new ones.

3. Communication

Interdisciplinary work runs into problems created by differing jargons and research traditions. Walter Kintsch noted that you may not even realize that your interpretation of what someone means by the same word is a little different from yours. More subtly, communication can be undermined by differing assumptions about values (e.g., the worth of studies using large numbers of subjects vs. case studies, or the value of neural plausibility in a simulation). You need to understand the values of the other field, and you need to learn to communicate the values of your own field, as well as trusting your colleagues to some extent.

Kintsch also noted that having ICS people inside the various departments made major differences in having other members of those departments come to

understand the value of interdisciplinary work. Therefore, you need key people in all the departments if you're trying to build institutional structure; it seems to be the way for departments to learn that other fields may have something to offer them and are worth investing in. (Kintsch recalled that Computer Science at Colorado used to try its own introspection for understanding linguistics and psychology, until they discovered, through their ICS members, that they were reinventing the wheel.)

Communication about what people really do, via key members in the various departments, is also essential in dealing with another perennial problem: a proposal to hire a person who does interdisciplinary research often arouses resistance, for fear of diluting the department's program. The reaction of a department is likely to be the objection that the candidate is 'not a linguist', 'not a computer scientist', etc. Someone in the department has to be able to communicate what the candidate will bring that will strengthen the department as a whole.

4. Personal time/Development time

Investment of time — our most highly-valued good in academia! — has to have a perceived payoff (a low risk-to-benefit-ratio) for both the people who are doing the work and those who are paying them. Enormous patience is required for scheduling meetings and getting people to serve on institute committees. Scheduling interdisciplinary courses, getting courses cross-listed so that they can be counted towards the degrees in the various departments, and getting credit for courses taught outside the instructors' home departments require patience, knowledge of the rules, and the ability to negotiate with the people who have the power to change those rules. An institute also needs to move fairly quickly when opportunities do become available; having goodwill in the overlapping departments and in the administration pays off when there's a chance for a key hire.

It takes time for a cooperative culture to emerge, and for people to see what it's good for. The structure of the interdisciplinary institution has to foster the cooperative culture, and allow time for understanding to develop. Internal informal research presentations with discussants from different disciplines, jointly-taught courses, and jointly-led seminars are specific things that ICS has done to foster the emergence of such a culture.

Payoffs for organizing and attending any of these events may be remote; the people who do the work need recognition, because that may be all they get for a while. Organizers of these events also have to realize that meetings will typically be attended only by subsets of the whole group; there's no point in getting upset over that. That's the personal time risk/benefit equation again.

One thing that makes the university a great incubator is that the people paying us for our work aren't asking for time sheets (at least until we apply for grants). Our output is intellectual substance, crudely measured in publications and successful grant proposals.

5. Distance

Collaboration requires contact, and it's a fact that new collaborations are principally born of conversations during casual contact. Social opportunities provide introductions and attention to each others' work. So interdisciplinary organizations must maximize opportunities for members to have casual contact; the coffee and pastries and beer and munchies at meetings are investments, not frills. Retreats, however, have not seemed to be effective ways to increase new research, at least not in proportion to the time and money that they require.

Committee contact also seem to catalyze project starts; a very important site for engendering new ICS projects has been interdisciplinary student doctoral committees. (One might see students as bees cross-pollinating departments.) However, for such committees to be formed, some nuclear interdisciplinary faculty teams need to exist. Walter Kintsch noted that students won't do interdisciplinary work without that support structure, because there's so much extra to learn (see 8, Curriculum).

Providing central space and facilities devoted to the interdisciplinary group are obvious ways to bridge physical distances, expensive though they are. There is also another kind of price: people housed in interdisciplinary facilities are almost always separated from their departments (it is rare that an institute can share building space with more than one of its overlapping departments). This increases their marginalization in the department. One solution is for institute members to have offices in their home departments, and labs in space dedicated to the institute.

6. Institutional structure

A lot of what an institute does is to obtain and re-distribute wealth. This includes indirect cost returns on federal grants, funding obtained from the university and from outside donors, student research and/or teaching assistants, donated equipment, support for students, library orders, and intangibles like visibility from giving institute lectures and publication in institute working papers. The structure of the institute has to insure a real and perceived fair distribution of payoff for everyone, not just for the people in the richest departments (usually computer science and psychology). Some directors get along with departments and schools, some don't; no one can make everyone happy, but their primary responsibility is to the institute members.

The actual and perceived fairness of the institute director is crucial: the director must not put forth a particular agenda while acting as director. This doesn't mean giving up one's own research, but it does mean recognizing that it doesn't have priority for the institute. The same is true for the executive committee, the curriculum committee, and whatever other decision-making bodies there are. The goal of fostering creativity and hard work entails that there must be a loose, bottom-up structure; an institute has to be a loose coalition of partially overlapping research groups. The individual investigators must have responsibilities and be able to see the rewards of their work.

7. Payoffs

What faculty want is help with research (grants and publications) and help with teaching (assistants). Students want exciting research, money to live on, good job prospects. Smaller amounts of money, like travel funds and student research funds, may be the only reason a lot of graduate students initially participate in institute activities. Departments want new lines and prestige, within the University and outside as well; schools and colleges want outside funds and national visibility. The institute must provide as much of what everybody wants as possible; circle back to items 1, 4, and 6 above. Being occasionally able to fund a new line in a department has been crucial to ICS — either as a 'bridge' (short-term funding then taken over by the department) or as a permanent line (see also 3, Communication). That's the kind of power that can be bought by a sufficient share of the indirect cost return.

8. Curriculum

There have to be non-glamour prerequisites to the exciting courses; programming, phonetics, formal syntax, and statistics are probably candidates for the most-hated requirement, and students need tangible rewards for enrolling in a program that demands so much of them.

Interdisciplinary programs have the same design issues as programs within departments, but they are compounded, because the student needs to master a larger assemblage of research tools, and furthermore to acquire the level of understanding necessary for the adaptability described under 2. above. Curriculum committees have to decide how much coursework and how much research apprenticeship to require; differing institutes have arrived at differing solutions, and probably no solution is perfect or stable.

9. Legislators and taxpayers

Interdisciplinary courses and programs are key mechanisms in training students who are capable of working across discipline boundaries (see 2. Adaptability and 3. Communication). State bureaucracies seem to be in the business of stifling innovation in the name of preventing program proliferation. A change of state government can negate years of patient work. Sorry, I don't know any answer to this one except sheer persistence. Clearly, the bottom line is that success requires commitment, from the university, the interdisciplinary group, and the individual people who are in it.

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LINGUISTICS FOR 'EVERYSTUDENT'

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A key goal of undergraduate teaching in linguistics to to instill in students a sense of just how remarkable human language is. To that end, introductory courses need to be aimed at 'Everystudent' (the ordinary person-on-campus), and by doing so, we increase accordingly our potential for reaching every student. It is argued here that two important 'hooks' into the examination of language for such students are pragmatics/semantics — the interpretation of utterances in context — and sociolinguistics, for these are areas that students live and experience on a daily basis. Similarly, exposing students to the more humanistic side of language and linguistics can pay off, by touching the basis of humanity that we all share.

0. Introduction

The stated topic for this most interesting and revealing symposium was 'The Linguistic Sciences in a Changing Context' and it is of some interest (especially since no other speaker seems to have picked up on it) that instead of referring to 'Linguistics', the organizers saw fit to characterize the field as 'the linguistic *sciences*'. Without wanting to initiate a debate as to whether linguistics is a science or not — I for one think that it is, to some extent (and the extent may be the real cause for debate!) — I feel it is worth noting that 'relevance to wider curricula', the session title for my presentation and the one out of the pre-announced areas of focus for the symposium that my presentation is aimed at, could simply mean looking to ways in which linguistics, as a science, can address an audience of non-scientists.

The issue is not really that simplistic, but my focus for the most part is not on linguistics as a science per se, but rather is oriented more towards linguistics as a humanistic enterprise.

This is altogether appropriate, I would argue, for the key to at least half the battle in understanding language lies in recognizing that language is a social phenomenon, something that exists, so to speak, in the interactions among humans and in the way they define themselves as humans. This is not to deny the psychological and more individual side of language or to ignore the view that treats language as an abstract symbolic system with mathematical properties, but rather to focus on the aspect of language and of linguistics that, I argue, is critical to reaching the larger audience implicit in the declared focus of this session. Moreover, in a changing context in which linguistics, like many fields, is moving

increasingly, it seems, towards formalization and technologicization in its methods and paradigms for inquiry (note the presentations by Dan Jurafsky, Lisa Menn, Steve Levinson, and Molly Mack on computational linguistics and neuroscience), some recognition of the less formal side, and the potential audiences in that camp, is important.

It is appropriate also to consider those on the 'other side of the tracks', since the dual status of linguistics is reflected in its classification in various universities, partly due to linguistics being (as Jerry Morgan noted in his introduction to the symposium) the new kids on the academic block. At some schools (e.g., the University of Washington), linguistics counts administratively as being in the humanities, whereas at others (e.g., the University of California at Berkeley) it is treated as a social science (see Pullum 1985/1991 for some characteristically enlightening observations on this subject). At my university, the schizophrenic status of the field is reflected in the fact that our administrative home is in the humanities but several of our courses are classified curricularly as social sciences. Some of my comments later on address some of the consequences of this classification (and it is certainly a topic for discussion to consider just where the field *should* be classified).

Part of what I am talking about here is 'linguistics for every student', what was given in the conference program as my title, i.e., linguistics for any potential taker, for as many potential takers as possible, but some of my comments address also linguistics for 'Everystudent', what I had originally thought of for my title, representing the ordinary 'person on campus', the regular Jane or Joe who is not likely to ever be a linguistics major but who might take linguistics to fulfill a requirement; the number of 'Everystudents' may not be the same as the total of 'every student' but my claim is that we can orient our linguistics offerings towards this hypothetical 'Everystudent' and in so doing may be able ultimately to attract 'every student' into exposure to linguistics.

1.0 Achieving a basic goal of undergraduate linguistics courses

In any case, I start with my take on what a key goal of an undergraduate program in linguistics ought to be, namely to instill in students some sense of just how remarkable an entity human language is.

One way to achieve that goal is to follow a common cognitive strategy of looking for the familiar in the unfamiliar (the basis of analogy, and the way Wordsworth characterized how humans deal with something new) and thus to approach language through what students already know, whether or not they are aware of it; here, the unfamiliar is linguistics itself, as well as linguistic analysis, whereas the familiar is the students' own usage and linguistic experience.

One area that can be tapped in this way, possibly even towards the beginning of an introductory course is pragmatics, the interpretation of and utterances in context and for that matter, semantics in a general sense, for the distinction that linguists draw between semantics (e.g., formal, truth-conditional semantics) and pragmatics (contextually driven interpretations) are not as clear to students, for

whom all interpretation in their real lives is of sentences in context, not as disembodied units for analysis. Students have experience with this, whether they know it as pragmatics/semantics or not, since everyone uses language and interprets utterances as part of being involved in interactions with other speakers.

Some linguists have recognized the potential for using semantics and pragmatics as a starting point for getting students into the study of language. Janda 1998 outlines how one can and should, in his terms, teach linguistics 'backwards', reversing the usual flow from the lowest level of phonetics to the highest level of meaning; he notes that students have a hard time dealing with language without meaning, i.e., just segmenting words into phones and analyzing the phonological units, and he advocates starting with the level of meaning and 'working backwards', so to speak, down to the level of meaningless sounds. One is reminded here of Roman Jakobson's statement that 'language without meaning is meaningless' (a very meaningful, though on one reading tautologous, statement that only Jakobson could have gotten away with!). Indeed, several instructors in the beginning linguistics class at Ohio State (Linguistics 201: Introduction to Language) start linguistic analysis with morphology, where the manipulation of meaningful units provides students with a concreteness that is not available with segmenting sounds and looking for their distribution. Moreover, a couple of introductory linguistics textbooks take meaning as their point of departure for introducing students to linguistics; Parker 1986 has the following order of presentation of 'core areas' of linguistic analysis: pragmatics, semantics, syntax, morphology, and phonology, and in Jeffries 1998, the order of chapters is 'sounds and meaning; words and meaning; structure and meaning; textual meaning; contextual meaning; and meaning and reality', with each chapter (as well as the title) stressing meaning in language.

Thus drawing students' attention to what makes Speaker B obnoxious in often-discussed exchanges like:

A. *Can you pass the salt?* B. *Yes, but I won't.*

can generally provoke contributions by students of similar experiences of their own. There is also the possibility of drawing on dialogue from movies and plays, and even occasional reflective comments from within the popular media, such as this learned disquisition by Johnny Depp's character in the movie *Donnie Brasco* (where Depp plays an undercover agent who infiltrates organized crime) on the varied meanings of the expression *Forget about it* that his mobster buddies (including the boss, Lefty) use a lot; Depp is talking with two other FBI agents, and though the content is somewhat raw and definitely crude, the scene still makes for an interesting point of departure for discussion of pragmatics — moreover, there are intonational differences (indicated somewhat inadequately with numbers over each syllable, where 1 indicates highest intonational prominence), as well as voice-quality differences (some glottality (indicated by underlining) in the second case, much more in the fourth case, and a drawn-out pronunciation in the third) associated with the different instantiations of *Forget about it*, but such differences provide added fodder for class discussion:

Agent #1: Hey, can I ask you something? What's 'Forget about it'? What is that?

Depp: 'Forget about it', it's like, uh — if you agree with someone, y'know,
like 'Raquel Welch is one great piece of ass,
2 1 3 3 4
forget about it. But then if you disagree, like
3 1 3 4 4
'A Lincoln is better than a Cadillac, *forget about it*,
y'know, but then it's also if something is the greatest thing in the world, like
2 1 2 2 3
'Mingaro's peppers, *forget about it*. Y'know, but it's also like saying 'Go to Hell!', too, like y'know, like uh 'Hey Paulie, you got a one-
2 1 2 2 2
inch pecker' and Paulie says '*Forget about it*!'.

Agent #1: Forget about it. Paulie, forget about it.

Depp: Sometimes it just means, uh, forget about it.

[Laughter]

Agent #1: All right. Thank you very much; I got it.

Depp: Let me tell you something — I don't get this boat for Lefty ...

Agent #1: What?

Agent #2: Forget about it?

Depp: Fuckin' forget about it!

Similarly, sociolinguistics can be tapped, especially with regard to variation and the social value of different variants, since students 'live' sociolinguistics on a daily basis, through their encounters with others, their assessments of the usage of others, their concerns about the impressions they make with their usage, and so on and so forth; even if the students are not aware of what they know in this regard, it can be brought to the surface fairly readily. Regional differences between northern vs. southern Ohio or Appalachian features in pronunciation and morphosyntax and their evaluation in Central Ohio work well at Ohio State University:

(1) a. Northern Ohio (e.g., Cleveland) *bag* vs. Southern Ohio (e.g., Chillicothe) *sack*.

b. Appalachian *needs washed* (vs. *needs to be washed* or *needs washing*), *fish* pronounced as [fiʃ] (vs. [fɪʃ] elsewhere in Ohio).

There are undoubtedly similar features to point to elsewhere in the U.S. that a school's typical student population will relate to (e.g., pronunciations of *Chicago* in Illinois) which mark a person not just as being from somewhere but also as belonging to a particular group (social, ethnic, or the like). I have found that recognizing the role even of vocabulary particular to a given interest group they be-

long to or a job they hold — jargon, that is — can be an eye-opener for many students and such jargon is a type of socially-based variation that is very salient to them.

The main point here is that students experience the subject matter of pragmatics and sociolinguistics on a daily basis, whether they know it or not, and so we can tap that experience and exploit it to draw them into understanding linguistics. Needless to say, that is not the case with a lot of areas of linguistics that are standard fare in introductory linguistics classes, such as doing phonemic analysis or applying tests for constituent structure in syntax!

In fact, this can be a winning strategy in lots of ways. At Ohio State, we have found that focusing several low-level undergraduate courses on sociolinguistics or aspects of linguistics that are highly accessible to ordinary folk has had a dramatic effect on our ability to reach a large number of students (i.e. we have made positive strides forward with enrollments). These courses are listed in (2):

(2) Linguistics 350: Language and Gender
Linguistics 361: Language and Social Identity in the US
Linguistics 365: Language Across Cultures
Linguistics 385: Language Change and Development

The titles are fairly self-evident as to course content, though note that 385 is a low-level historical linguistics class that uses synchronic variation as the basis for understanding the processes of language change. Based on Gregory Ward's presentation, it is clear that a similar strategy is working at Northwestern University too.

In recent years, with declining enrollments in our basic low-level introductory linguistics class, we experimented at Ohio State by offering more sections of these courses, as well as a low-level psycholinguistics course (Linguistics 371: Language and the Mind), which we had the good fortune to be able to cross-list with Psychology, with its seemingly endless supply of majors! Still, the sociolinguistic classes were the heart of the experiment, and a successful experiment it was! Enrollments have become quite healthy, fed by these courses (see Joseph 1996 and Sutton et al. 1996 for some discussion).

By way of illustrating the success of using sociolinguistics to reach out to nonmajors, I give the following [illegible]

(3) 1994-5: 34 (32/2) sections; 904 students;
summer '95: 6 (4/2) sections; 70 students
1995-6: 40 (36/4) sections; 947 students;
summer '96: 7 (4/3) sections; 91 students
1996-7: 41 (33/8) sections; 1062 students;
summer '97: 8 (4/4) sections; 151 students
1997-8: 47 (33/14) sections; 1399 students;
summer '98: 8 (4/4) sections; 128 students
1998-9: 33 (24/9) sections; 497 students
[NB: this is for autumn/winter quarters only; 3 of these sections are Honors section]

The 1996-7/1997-8 increases are not just due to our offering more sections, since the average per section has also increased dramatically from its 1995-96 low point: 26.5 ('94-5), 23.7 ('95-6), 25.9 ('96-7), 29.7 ('97-8), and in any case, the increase in the number of the sociolinguistically-oriented courses between '96-7 and '97-8 (from 8 to 14) was driven by their sustainability — each extra section was able to meet, and indeed to far exceed, the minimum number of students needed to make the offering viable.

Moreover, it is worth noting that the increase in enrollments spearheaded by the shift in the types of courses we offered at the undergraduate level seems to have helped to buoy up *all* the offerings at that level, for the enrollments in the general survey course are up also.

These numbers speak for themselves and show that there is a way of bringing linguistics to the masses, to Everystudent and to every student, if we find the right 'hook'.

We have to remember too, though, as Richard Janda has reminded me, that 'Everystudent' changes over the years, and thus what may have worked in one period will not always be a salient hook. He has pointed out that the highly successful introductory textbook by Vicki Fromkin and Bob Rodman (Fromkin & Rodman 1974ff.) in its early editions had lots of references to *Alice in Wonderland*, but the authors found that they had to tone down those references in later editions because students simply were not familiar with Lewis Carroll — probably references to Alice in Chains or Alice Cooper would have been more salient than Alice in Wonderland! For instance, in the 1993 edition, the section on 'competence and performance' has a *Far Side* cartoon by Gary Larson and just a few lines about Alice where the same section in the 1974 edition had far more discussion of two passages from *Alice in Wonderland*. Thus, we must always keep in mind that 'Everystudent' is a moving target!

2.0 A further strategy — The human side of historical linguistics

Another angle on making linguistics accessible to 'Everystudent' is to present ways in which linguistics and affiliated areas that have depended on the results and successes of linguistics can tap some basic aspects of 'humanitas' that students can relate to. By this I mean those universals of human experience that fur-

nish excellent material from which we can score linguistic points, either about matters of linguistic analysis or about potential benefits of linguistics.

A good example has been developed in the classroom by an advanced graduate student at Ohio State, Jen Muller; she uses the first quatrain of a sonnet by John Milton written around 1632 to illustrate language change by giving an example of early Modern English that shows differences in vocabulary, morphology, syntax, even spelling, compared with Modern English; interestingly, she has found that the students respond well to the *content*, specifically a 23-year old guy wondering why he hasn't made more of his life and why he doesn't have more direction and maturity; this is thus a timeless theme, and the purely linguistic exercise of comparing the earlier language with a later stage of the language allows the more humanistic point to come through, and at the same time, their interest in the content allows the students to become more engaged in the exercise:

> How soon hath time the suttle theef of youth
> Stolen on his wing my three and twentieth yeer
> My hasting days fly on with full career
> But my late spring no bud or blossom shewth.
> Perhaps my semblance might deceive the truth
> That I to manhood am arrived so near
> And inward ripeness doth much less appear
> That some more timely-happy spirits endu'th.
> Yet be it less or more or soon or slow
> It shall be still in strictest measure eev'n
> To that same lot however mean or high
> Toward which Time leads me and the will of Heaven.
> All is, if I have grace to use it so
> As ever in my great task Master's eye. (John Milton, c. 1632)

There are several similar cases like this, where the content is intrinsically interesting or compelling in some way and the results of linguistics or the application of principles taken from linguistics, e.g., in philological interpretation) can be seen as playing a role in bringing the relevant text to light.

For instance, the Rig Veda, the collection of ancient Hindu sacred hymns composed in the oldest Sanskrit known, whose study by linguists has formed the backbone of comparative Indo-European linguistics, is a wonderfully compelling text, rich with imagery and archaic language that transports one back well beyond the date of 1200 BC conventionally given for its composition; what can be particularly interesting to students in a beginning linguistics class is the recognition that recurring themes of the Rig Veda, as described by Wendy O'Flaherty 1981 in the introduction to her translation of it, sound just like titles from popular books of today: 'conflict within the nuclear family and uneasiness about the mystery of birth from male and female parents; the preciousness of animals ...; the wish for knowledge, inspiration, long life, and immortality' and so on. The more things change, the less things change, a valuable lesson for students and one that comparative linguistics of the 19th century has helped to make accessible to us today.

Another case like this that I am quite fond of, where the results of comparative Indo-European linguistics and philology have yielded similar insights, is Craig Melchert's article about the Hittite king Hattusili facing death (Melchert 1991); Hattusili, a Hittite king of the second millennium BC, apparently was dictating his last will and testament to a scribe, and, suffering an ultimately fatal or nearly fatal episode as he finished the official dictation at the end, began reflecting somewhat incoherently about his impending death, ravings which were dutifully copied down and recorded for posterity by the scribe. Hattusili ends with an exhortation to a woman he has been calling for: 'Protect me on your bosom from the earth', apparently his real last words. Melchert's interpretation of this, in the light of the fact that the Hittites seem to have practiced burial (not cremation), but believed in an afterlife and immortality in divine form for its kings, is that 'Despite ... assurances of happy immortality, however, the dying Hattusili is frightened. He sees only the immediate certainty that he will soon be put down into the cold, dark earth alone, and like many a poor mortal since, he finds this a terrifying prospect'. I find Melchert's closing remark right after this to be especially significant in terms of linking modern-day folks with those that preceded them 3500 years ago, as he says, with real eloquence: '... there seems to be little fundamental difference between us and ancient peoples when it comes to facing death. Hattusili's words speak to us directly across the centuries. His fear is palpable. We not only at once understand but also are moved by his agony and his desperate cry for his loved one's tender comfort. These emotions are neither Hittite nor Indo-European, neither ancient nor modern, but simply human'.

In a similar vein, especially as regards linking folks across centuries, the following passage from Chaucer's *Troilus and Criseyde* gives voice to a question that could easily come up in an introductory linguistics class — one can imagine a student asking whether people *really* spoke as they seem to have in Shakespeare's day! — namely the very real wonderment at the fact that a different form of the language 1000 years before the speaker's time could nonetheless serve its speakers well for 'sondry usages', even though in this case, the speaker's vantage point is not 1998 but rather some 600 years ago:

> Ye knowe ek that in forme of speche is chaunge
> Withinne a thousand yeer, and wordes tho
> That hadden pris, now wonder nyce and straunge
> Us thinketh hem, and yet thei spake hem so,
> And spedde as wel in love as men now do;
> Ek for to wynnen love in sondry ages,
> In sondry londes, sondry ben usages.
>
> (Geoffrey Chaucer, *Troilus and Criseyde* II.22-8)

Pieces like these allow one to make important linguistic points about the nature of data collection from older stages of a language and from ancient languages, about the need to 'decipher' texts, and to allow for change within a given language, but their content speaks to universals of the human experience, expressing timeless feelings that everyone is aware of, and so makes an important nonlinguistic point about the links among peoples at all periods in history.

Moreover, their use in introductory linguistics courses, quite frankly, introduces a 'kinder and gentler' spirit to the linguistics classroom that can provide a useful balance to the rigors of formal linguistic analysis.

3.0 Extending the humanistic strategy

Going further in this direction, since my talk has taken a literary turn, there is an audience of literature-oriented students that linguists can and should talk to within the academy; the antipathy that seems to exist in many language departments between linguists and literature types is unfortunate but real (as William Davies' presentation made clear). My Old Irish class at Harvard 25 years ago is a case in point, with 3 budding Indo-European linguists and 3 Celtic literature students — we sat on opposite sides of the table and at one point one of the literature students said 'If they [i.e., the linguists] ask one more question about a nasalizing relative clause I'll go crazy'; of course, it is *just* as important for literature students to be able to recognize a nasalizing relative clause as it is for linguists, so we were in the same boat, but they saw us as adversaries! It makes one think that literature types are from Venus while linguists are from Mars, with no reconciliation, but I would suggest that there are some real benefits for both sides to be gained from talking to one another!

My other role at Ohio State, besides being in the Linguistics Department, is in the Slavic Languages and Literatures Department, where I hold a 30% appointment. In that department, all beginning graduate students in Russian literature take a proseminar, covering an introduction to Russian linguistics. While the formalism of linguistics may be daunting and off-putting to these generally non-formalistically-inclined students, they can come to appreciate the goals of modern linguistics with the right sorts of prompts from us, e.g., by likening the quest for understanding how language emerges in individuals to other aspects of human development such as walking, and the quest for understanding change in language to an interest in change in other human institutions. Moreover, there are topics that they can relate to, e.g., phonic imagery / verbal art, discourse analysis and literary criticism, use of vernacular in dialogue for special effect, etc. It is useful to note here what William Davies mentioned in his presentation regarding the translation studies program at the University of Iowa and the French linguistics and literature initiative at the University of South Carolina, as well as the existence of works like Traugott & Pratt 1980 that are directly aimed at this audience.

In my own experience, I have found, while lecturing to the group of Russian literature students this year in the linguistics proseminar, that these students responded well to the use of phonic effects in literature, such as the well-known instances from Tennyson:

(4) a. The moan of doves in immemorial elms
And murmuring of innumerable bees (*The Princess* VII.206-7)

b. A gloom monotonously musical
With hum of murmurous bees, ... (*Sense and Conscience* 45-6)

where the preponderance of [m]'s is supposed to iconically summon up the sensory image of the humming of bees; it allows students to ponder the old but important question of the arbitrariness of the linguistic sign, and the role of an author's conscious choices in creating verbal imagery and in stylistics. Such examples can be found in literature in all languages, no doubt — for the Russian students, I included the following from Pushkin's *Evgeny Onegin*:

(5) ʃipen'e penistyx bokalov i
hissing/NOM foamy/GEN.PL wine-glasses/GEN and
punʃa plamen' goluboj
punch/GEN flame/NOM blue/NOM
'The hissing of foamy wine-glasses and the blue flame of punch ...'

where the repeated labials and the sibilants supposedly reinforce the image of bubbling wine.

4.0 Conclusion

By way of conclusion, let me say that I can offer no guarantee that these considerations will have dramatic effects on enrollment or will rescue courses or keep deans off the backs of linguistics department chairs, or whatever, but I see them as part of an orientation that the field *can* take to be inclusive in its reach and to try to bring the results and methods of linguistics to audiences that might otherwise be left behind as the field shifts towards an increasingly formal and technological orientation.

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THE ECOLOGY OF LANGUAGE: NEW IMPERATIVES IN LINGUISTICS CURRICULA

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Language endangerment is undoubtedly among the most current topics in linguistics today. My review of the literature suggests a number of shortcomings in the way linguists have discussed the subject matter and some inadequacies in the kinds of remedies that have been recommended for the problem. I conclude that compared to our counterparts in ecology, who have been concerned with endangered species, we in linguistics have done little basic research about the life of a language and are therefore ill-prepared to recommend adequate solutions to the problem. We should do more research on the subject matter and offer more courses in our curricula to prepare future generations of linguists better for the question of language endangerment.

The 1990s will undoubtedly be remembered in the history of linguistics as the period during which awareness of language endangerment and death increased among linguists. It will also be remembered by the kinds of concerns expressed over this state of affairs; chief among these is linguists' primary focus on loss of diversity — very much in the interest of their profession, based at least on the way Krauss 1992 and Hale 1998 present the subject matter. There have also been several expressions of solicitude about the relevant populations losing their ancestral traditions along with their languages, but concern over loss of linguistic diversity seems to stand out. This response is in contrast with linguists' marginal interest in the balance sheets of costs and benefits from the perspective of former or current speakers of the dead or dying languages, respectively.[1]

Hale 1998 characterizes the primary concern of linguists correctly as 'self-serving.' Over a decade earlier, Fishman 1982 had expressed a similar concern, arguing that language policies in the Western world have promoted shifting to major languages of domination at the expense of minor languages (for the purposes of developing nations that are monolingual). Remarking that there is beauty in diversity, he stated that the loss of languages spoken by smaller communities of speakers is an expensive price for humanity to pay. Interestingly, linguists have seldom criticized themselves for advising Third-World countries, in the 1960s, to promote national official languages (qua languages of wider communication), which would allegedly foster national unity and expedite their development. This was indeed a central concern of the sociology of language then, as expressed by some essays in Fishman 1968.

The 1990s will also be remembered as the period during which most of the literature on language endangerment was written by theoretical and anthropological linguists working on languages spoken in small communities, typically non-Western languages with 'uncommon' structural features and world views, languages which are likely to contribute more to our understanding of linguistic and cultural diversity. The main argument is that if the minor languages may be preserved — regardless of the living conditions of their speakers (I may add) — we can learn more about language typology and inversely about the architecture of Universal Grammar.

Less vocal during this period have been students of the ethnography of communication. This state of affairs reflects scanty ecology-based research on language evolution.[2] It also reflects insufficient understanding of language shift as an adaptive response to changing ecologies, which could explain how in the first place so many languages have become endangered, for instance, during the post-colonial, rather than the colonial, period in North America.[3] The limited literature that is ethnographically informed, such as Dorian 1998 and Hale 1998, is itself still very much dominated by a Western European perspective. Responding to what Dorian identifies as 'ideology of contempt,' this literature attributes the demographic and/or structural attrition of the endangered languages typically to their speakers' loss of pride in their ancestral languages and cultures.

The Western bias can likewise be detected in one of the most common solutions linguists have proposed to halt, or slow down, the erosion of the endangered languages: development of a writing system and of literacy. *Pace* Hinton's 1995 'success story' about California Native American languages, this kind of solution does not help a language thrive. Instead, it helps the language be cherished and be preserved as a fossil, or in the frozen ritualized form of some ancestral ceremonies. A language does not thrive unless there is a requisite socio-economic ecology that nurtures it, making it useful to speakers for their survival. In fact, such an ecology has little to do with size of the population that speaks it, nor with whether the relevant population dominates another or is dominated. There are many cases, especially in rural Africa, where a language spoken by a small ethnic enclave has thrived for as long as the ambient socio-economic or political ecology did not change to the disadvantage of its speakers. Such cases are more common in places where there is no global economic system, which is itself an explanation of why fewer sub-Saharan African than Native American languages have been endangered by European colonial languages. (I return to this question below.)

With respect to domination, aside from the case of the belated endangerment of Native American languages (compared to the earlier losses of African and several European languages to specific European languages in the Americas), note the case of Irish, for example. Although Ireland was colonized by the English long before the Norman Conquest in the 11th century, it is only since the 17th century that the Irish have been shifting to English as their vernacular. In fact, the trend did not become quite pronounced until the 19th century, with changes in

the socio-economic integration of the indigenous population. I return to this aspect of language endangerment below.

Regarding the role of literacy, as Dorian (1998:11) observes, Irish has been losing ground to English despite its rich literature. Note also that the most celebrated dead languages, viz., Hittite, ancient Greek, Latin, and now Sanskrit, all had rich literary traditions.[4] Hinton's 'success story' is thus more or less like protracted death, rather than real language survival. It is in a way ironic that linguists would place so much faith in developing literacy and writing systems when we have professed all along that even in literate societies language is primarily spoken.[5]

The 1990s will also be remembered as a period during which linguists compare poorly with those population geneticists who are concerned with endangered species. The latter have sought solutions by recommending actions on the ecologies that have disadvantaged the endangered species. It would make little sense to release, for instance, bald eagles raised in captivity to an environment that would not be a hospitable niche to them, enabling them to survive or to reproduce themselves. To be sure, if one subscribes to Mufwene's 1999 position that languages are parasitic species — more specifically, of the symbiotic kind — linguists too have been working on the ecologies of the endangered languages, focusing on their host, the speakers. Unfortunately, they have avoided dealing with the larger socio-economic ecologies to which the speakers have been adapting themselves at the expense of their ancestral languages. It is not just a matter of focusing on some ecology, it is also a question of focusing on the relevant ecology.

Interestingly, when one looks at the big picture, quite a number of new language varieties have been emerging while several others — and more, to be sure — have been endangered. Silence on the new varieties, which have contributed to more diversity, also reflects poorly on linguistics, viz., absence of a well-articulated body of knowledge that should enable us to distinguish ecological conditions that are conducive to language endangerment from those that either maintain the status quo or lead to speciation, hence to more linguistic diversity. More generally, from an academic perspective, it is also lack of time depth in the literature on language endangerment that is striking, viz., the absence of an important historical dimension that would prompt us to investigate and isolate more accurately ecological conditions which have disadvantaged some — to be sure, a large proportion of the world's languages — and those conditions which have favored some others.

We have little sense of why multilingualism has produced language attrition in some societies, but has not in some others, for instance, why so many Native American languages are moribund whereas African-American English seems to be thriving, as stigmatized as it is. Nor do we have much sense of how language mixing has become symptomatic of culture loss in some communities, but has not in others (Woodbury 1998). A careful reading of Dorian 1989 would suggest investigating several and diverse situations more closely, so that we may be better

informed on differing outcomes of language competition. I conjecture that in North America Native American languages have belatedly joined the club of several European languages that have lost to English; they are dying not because their speakers have lost pride in them but because, after being integrated, or just involved, in the socio-economic mainstream (more or less like other European Americans who are not of English descent), they have had to adapt to a changing socio-economic ecology in which English is required for their survival.

This contextualization of the general issues should help us also address questions such as why, like Appalachian English, African-American English (including Gullah) is not endangered, at least not yet, whereas Ocracoke English is. Yet all of them are stigmatized, and the stigmatization of Gullah is compounded by the ethnicity of its speakers! Appalachian English is not dying yet because it continues to be isolated from the mainstream of the American population. There have been more emigrations from than immigrations by economically better-off outsiders to where it is spoken. Gullah has survived so far because the affluent Americans, mostly Whites, who have immigrated to the Sea Islands of South Carolina and Georgia have not lived together, nor interacted regularly, with the local African Americans who speak it (Mufwene 1997). The Sea Islands are now as residentially segregated as American cities, where African-American vernacular English thrives. As the situation is presented by Wolfram & Estes 1995, Ocracoke English is endangered just for the opposite reason: its White speakers have been influenced by the more affluent White Americans from the mainland, with whom they interact on a regular basis and intermarry. What is evident in this bigger picture is that even dialects of the same language are sometimes endangered, albeit quite selectively. This should prompt us to better understand the ecology of language endangerment, which should also help us understand why, for instance, Native American languages have not been endangered all at the same rate.

Alas! the 1990s may also be remembered as the decade during which the experts had little that is quite informed to offer on the subject matter of language endangerment. To be sure, there are reports of success stories about language reintroduction or promotion in specific ecological settings with high ideological commitment, such as Israel with Hebrew, Quebec with French, Wales with Welsh. These are isolated cases which reveal not our academic understanding of how language competition is resolved by laws of nature, so to speak, but rather instances of ad-hoc interventions by laypeople against those natural laws. What makes them significant and relevant to our concerns with language endangerment is that they show that restoring or revitalizing a language requires not encouraging speakers to develop (more) pride in their heritage but (re)creating an ecology which is hospitable to it.

Let's face it, the massive loss of languages, as well as the rise of new language varieties, are far from being peculiarities of the 20th century, or of the colonization and domination of the rest of the world by Europe over the past five centuries. If we just reflect more on language evolution in Europe alone, from the perspective of language competition, we may not be surprised to learn that Europe must have had several small languages that succumbed to the spread of

West Germanic and Latin, for example. The Melanesian multilingual situation described by Mühlhäusler 1996, with its multitude of small languages, was probably more typical of pre-medieval Europe than the current situation in which minority languages such as Breton and Gaelic are holding on a thin thread for their lives. English has prevailed in England at the expense of Celtic languages. So have the Romance languages in Western Europe. English itself is a novelty compared to the languages that the Jutes, the Angles, and the Saxons brought to England. It is the outcome of the development of those West Germanic languages into a new one, or rather a set of new dialects, just like the Romance languages are new phenomena compared to Vulgar Latin, from which they developed.

What genetic linguistics has generally not highlighted is an account of the specific ecological conditions under which all these interesting developments have taken place, which would enable us to better understand language evolution, including cases of language endangerment and death today. Language change and language endangerment appear to be different facets of the same more general process, viz., language evolution in an always changing ecology in which every language and every structural feature coexists and competes with others and may be affected by the changing ecological factors (Mufwene 1999).

More or less the same kinds of language evolutions as in England and Romance Europe have taken place in the territories colonized by Europeans over the past five centuries. In especially North America and Australia, as well as New Zealand, European languages, notably English, have won pyrrhic victories over the indigenous languages. While eliminating or just endangering the latter, they have prevailed generally in restructured forms, including not only those kept in the old franchise and recognized as (dialects of) Western languages (e.g., American English, Canadian French (Québécois), Latin American Spanish or Portuguese), but also those disfranchised varieties treated as children out of wedlock, whose genetic status has been more controversial, such as Saramaccan, Jamaican, and Haitian Creoles, and Gullah.[6] The literature on new and indigenized Englishes and on creoles, for instance, has plenty to teach us about language evolution from the point of view of competition and selection, not only on the level of features from the same pools identified socially as languages, but also on the level of languages competing with each other for monopoly over domains of usage.

From an ecological perspective, what is also quite interesting regarding the European colonization of the rest of the world, is the varying ways in which indigenous languages have been affected. While Western languages have endangered each other and indigenous languages in the Americas, in Australia, and in New Zealand, they have failed to do so in Africa and Asia. I surmise that differences in dominant colonization styles, rather than just a matter of colonial attitudes toward the indigenous languages, account for these differences in the linguistic consequences of European colonization. In all European colonies, the same 'ideology of contempt' identified by Dorian 1998 has applied, but only in some kinds of colonies have indigenous languages been endangered by European languages.

Settlement colonies have generally endangered the ancestral languages of the colonized, whereas exploitation colonies have not. There are, of course, some exceptions to this rough observation. For instance, the languages of European settlers in Zimbabwe and South Africa, viz., English in both and Afrikaans in the second, have not endangered the indigenous African languages. The explanation of these cases lies in the refusal of the settlers to assimilate the indigens to the colonial culture and to involve them fully in the same global economic system. Pronounced boundaries between the life styles of the settlers and of the indigens, associated with different languages, have not aroused generalized motivation for the indigens to acquire the settlers' languages, except among the minority who have been prepared to serve at some lower levels of the colonial socio-economic system. As a matter of fact, it is mostly after independence that European colonial languages in Africa have become more competitive in comparison with African lingua francas lexified by indigenous languages. Even so, because the average worker in sub-Saharan Africa has not participated in the global economy in the same way as the average worker in the 20th-century Americas and Australia, and because he or she can function in the socio-economic system without knowledge of the colonial language in his or her polity, European languages have not had the same kind of attraction everywhere. That is, pressure on the indigens to use European colonial languages as lingua francas or, most of all, to shift to them as vernaculars, has not been the same in different parts of the world, not even among the elite who have had a lot to gain from the adoption of the lingua franca or from the shift of vernaculars. In sub-Sahara Africa, the degree of commitment to the European colonial languages among the elite has not been the same, even within the same polity. For instance, there is more commitment to French in Gabon than in the Democratic Republic of Congo, where the vast majority of children of the elite are still reared in the national languages.

The relevance of assimilationist colonial policies to language endangerment applies also to the spread of Arabic in North Africa (since the 7th century), where it has produced the attrition of several indigenous non-Semitic languages such as Berber and Tuareg, and undoubtedly the loss of several minority languages. Although the Arabs settled North Africa by force, they allowed the indigens to assimilate to their culture; in fact they made it possible for the colonized to Arabize by adopting their religion and economic system. In East Africa, the Arabs generally assimilated to the local culture, though they maintained their religion, for which Arabic is required for the Quran, and their economic system, which they were able to conduct in the extant indigenous lingua franca, Swahili. Consistent with such variation in colonization styles, Arabic has been adopted as a religious language everywhere in Islamic Africa, but only in North Africa has it vernacularized among those who are not Arabs by race. It is thus clear what a central role socio-economic integration, rather than pride or literacy, plays in language endangerment. The speciation of Arabic into so many dialects in Africa today is apparently a consequence of speakers of so many different languages shifting to it.

The above divergent linguistic impacts of colonial languages in Africa has led Mazrui & Mazrui 1998 to treat Arabic, justifiably or not, as a language indigenous to Africa, not because it has been in Africa much longer, but because it has replaced several indigenous African languages as a vernacular. Since under both forms of colonization, Arabian and European, the indigenous African languages were kept at the bottom of the ethnographic scale, one can also see that the ideology of contempt, pride, power, literacy, and most of the classic explanations advanced by linguists for language endangerment and loss do not account for these processes. At best, such explanations are a small part of a complex phenomenon.

Such mistaken notions also explain why we have no sure solutions to help endangered languages survive, or thrive again, healthily. Dauenhauer & Dauenhauer 1998 observe at the beginning of their essay that most of what they report are cases of failure rather than of success. One may note without fearing to be seriously mistaken that so far linguists seem to have proposed ways of protracting the deaths of the endangered languages rather than helping them thrive in hospitable ecologies. Other actions must be taken that can create socio-economic ecologies that are more hospitable to them and more adequate research is definitely needed for this.

Let me emphasize that while some language varieties have been dying over the past two thousand years — and undoubtedly over a longer period of time — some new varieties have also been emerging. To be sure, we still cannot determine on structural grounds alone whether the new varieties (such as Saramaccan and Gullah) are languages or dialects of their lexifiers. However, it is worth noting that the Stammbaums of genetic linguistics would have little empirical justification if languages just died out and no new varieties developed from some of the older languages. The genetic speciation which they represent are justified by the emergence of new varieties. Unfortunately, on the balance sheet, the numbers and types of dead and dying varieties in particular geographical areas do not necessarily balance out with those of the new varieties, nor are the dying structural types to be found necessarily in the emerging varieties. Regardless of whether or not deaths and births even out, the bidirectionality of this state of affairs is part of the general process of language evolution, in which some older forms or structures are replaced by new ones, while losses and innovations co-occur in linguistic systems.

If such evolution has not bothered linguists before, from the point of view of linguistic diversity, perhaps we should explain more adequately why loss of some structural peculiarities through the disappearance of some languages today should become such a threat to the linguistic research enterprise and how such languages must be helped to thrive without inhibiting the adaptive responses of their speakers to their changing socio-economic ecologies. It may even be more critical to explain why actions are being taken on the victims rather than on the victimizers and the ecologies that the latter have created. It is also worth explaining why there has been more interest in loss of cultural heritage than in what the concerned populations hoped to gain in shifting to the dominant languages of their new socio-economic ecologies.

At the same time, let me also hasten to explain that I do not hereby argue for no action to be taken about language endangerment. I just wished to point out that wanting to preserve a language just so that linguists may learn more about language diversity without wanting to determine what its speakers have to gain or lose from the status quo, or from the status ad quem, may leave the impression, justified or not, of being a self-serving disposition.

It is also noteworthy that several languages have had different fates in different ecologies. For instance, although rated ethnographically at the bottom of the scale both in Africa and in the New World, transplanted African languages have not thrived in the New World, whereas only a few of them are now being endangered in Africa. Moreover, as suggested above, those African languages that are endangered are not losing to European colonial languages but rather to other African languages, most typically to the new African lingua francas. In this connection, note also that those languages which have survived in ecologies novel to them have done so in different ways. For instance, French has developed into Québécois in Québec, but into Cajun and French Creole in Louisiana; English has developed into so many new varieties in North America.

Equally noteworthy is the fact that some Native American languages have died faster than others, just as some Celtic languages have resisted French and English replacement longer than others. Likewise, it is noteworthy that Yiddish would survive longer in North America than in Israel, while Hebrew has vernacularized in Israel but remains a classical and religious language in North America. All in all, we should pay more attention to what distinguishes one ecology from another relative to both the languages that have thrived in one form or another and to those languages that are endangered. Only after this kind of groundwork can we feel as confident as our population geneticist counterparts in dealing with language endangerment. We could thus decide whether we should let speakers of the endangered languages handle their own matters in the same ways they have so far, or whether we should help the relevant societies in which they evolve create more nurturing ecologies for the relevant languages, without making it more difficult for their speakers to adapt to changing socio-economic conditions.

Undoubtedly, what we have recommended in the present decade reflects the state of our scholarship and the training we have provided in linguistics programs and departments, with only marginal interests in the lives of languages. Surely, there are scholars such as Grenoble & Whaley (1998:22) who can observe that 'Speakers abandon their native tongue in adaptation to an environment where use of that language is no longer advantageous to them'. I am just afraid that we have not learned much about the ecological conditions under which a minority's language may thrive and those under which it may not thrive, nor about the conditions under which advantageous languages endanger other languages, and those under which they do not, nor indeed about those conditions under which languages not so advantageous thrive at the expense of their cohorts in the same polity.

The bottom line is: more research is needed and linguistics curricula should be adapted to respond to these research needs. As we do all this, let us remember that languages are not independent of the speakers who host and speak them, our interest in the continuity of languages should not lose sight of the need for speakers to be well-adapted to the changing socio-economic environments in which they also wish to succeed. To help the endangered languages thrive again, it will take more than teaching pride and other positive attitudes to their speakers.

NOTES

[1] Wolfram & Estes 1995 argue persuasively that linguists should also be concerned about dialect endangerment. This is very much among my concerns, although, in order to cut down on the number of coordinate and disjunctive phrases, I will not mention 'dialect,' except where such mention is absolutely necessary. Almost all the comments I make about language endangerment in this essay also apply to dialect endangerment, where the situations are more or less the same.

[2] I am referring here mostly to language-external ecology (Mufwene 1999), which includes historical and current socio-economic and political conditions in which a language has been spoken. I use *language evolution* here to cover changes not only in the structure of a language but also in its vitality, which may decrease, increase, or remain the same, owing to changes in the ethnographic conditions of its usage.

[3] The colonial period was marked by decreases in the numbers of speakers of several languages, for reasons such as relocation, diseases brought over from the Old World, and warfare, novel ecological factors under which several Native American languages died. However, there was no pressure yet on the indigenous populations to shift to European colonial languages as vernaculars. Native Americans were generally marginal to the novel socio-economic systems that were developing and did not need the European languages even for trade, which was often conducted in contact varieties of their own languages, e.g., Pidgin Delaware and Chinook Jargon. I return to this aspect of language endangerment below.

[4] There are scholars who subscribe to the position that Latin and Ancient Greek are not dead but continue in mutated forms through the Romance languages and Modern Greek, respectively. Note, however, that these modern languages have developed not from the standard varieties of Classical Latin or Greek, which have bequeathed us rich literary legacies, but from their nonstandard and contact varieties, viz., Vulgar Latin and Greek Koiné. Such developments are proof that vitality of the spoken language is an important factor in its continuation or survival.

[5] This observation is not intended to undermine efforts to increase literacy around the world as one of the tools that should enable more people to adapt to changing socio-economic ecologies. However, specific choices made for implementing literacy have often also contributed to language endangerment, generally to the

disadvantage of languages that have not been used for literacy (Dixon 1997). Several countries around the world cannot afford to implement literacy in all their languages. The setup of economic systems around the world has made implementing literacy in all languages an onerous burden for would-be speakers of some of those languages.

[6] An interesting homolog of this in population genetics is speciation, which takes place when part of a species which has relocated develops new characteristics (by loss, addition, of dominance of some traits) in response to its new ecology.

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METATHESIS AND DAHL'S LAW IN EKEGUSII*

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In Ekegusii, a Kenyan Bantu language, certain synchronic data are argued to motivate a diachronic process of metathesis which is shown to affect two consonants, the first of which must be a voiced velar, over an intervening vowel. It is further shown that this process only occurs if there is a labial consonant which follows the voiced velar somewhere in the word. In some cases the voicing of the velar which undergoes metathesis is derived by a historical voicing dissimilation rule known as Dahl's law. However, this process appears to have applied in some reflexes of *kVp, but not others. While it is well known that primary place of articulation considerations often help to determine which consonants can undergo or trigger Dahl's law, it is argued here that to explain which *kVp sequences undergo Dahl's law and which don't, the secondary place of articulation of a consonant can also play a role.

1. Introduction

Ekegusii is a Bantu language (Guthrie E-42) spoken by some one and a half million speakers in and around the city of Kisii in southwestern Kenya. I will present data which I will argue is best accounted for by positing a diachronic process of metathesis. Unlike many instances of metathesis which affect two adjacent sounds, the metathesis in Ekegusii operates over a vowel, i.e., it changes certain C_1VC_2 sequences into C_2VC_1. The description of this process and its relation to other historical sound changes, particularly Dahl's law, will be the central focus of this paper.

2. Background and presentation of data to be accounted for

The classification of Ekegusii according to Guthrie 1967 is given in (1). Its classification according to Ethnologue and Nurse 1979) is given in (2) and (3) respectively. (Subgroup names are in SMALL CAPS.)

(1) GUTHRIE'S ZONE E

NYORO-GANDA: Nyoro (E.11), Tooro (E.12), Nyankore (E.13), Ruciga (E.14),
HAYA-JITA: Kinyambo (E.21), Haya (E.22), Jinja (E.23), Kerewe (E.24), Jita (E.25)
MASAMBA-LUHYA: Masaba, Gisu, Bukusu (E.31), Luhya, Hanga (E.32), Nyore (E.33), Saamia (E.34), Nyuli (E.35)

RAGOLI-KURIA: EKEGUSII (E.42), Logooli (E.41), Kuria (E.43), Zanaki (E.44), Nata (E.45), Sonjo (E.46)
KIKUYU-KAMBA: Kikuyu (E.51), Embu (E.52), Meru (E.53), Tharaka (E.54), Kamba (E.55), Daiso/Segeju (E.56)
CHAGA: Rwo (E.61), Chaga, Hai, Wunjo, Rombo (E.62), Rusha (E.63), Kahe (E.64), Gweno (E.65)
NYIKA-TAITA: Pokomo (E.71), Nyika, Giryama, Kauma, Conyi, Duruma, Rabai (E.72), Digo (E.73), Taita (E.74)

(2) ETHNOLOGUE'S CENTRAL ZONE "E" (follows Guthrie 1971)

KURIA (largely E.40): EKEGUSII, Ikizu, Ikoma, Kabwa, Kuria, Ngurimi, Sikazi, Sonjo, Suba, Ware, Zanaki
KIKUYU-KAMBA (largely E.50): Meru, Mhaiso, Embu, Gikuyu, Kamba
CHAGA (largely E.60): Chaga, Gweno, Kahe, Mosi, Rusha, Rwo
NYIKA (largely E.70): Chonyi, Digo, Duruma, Giryama, Malakote, Pokomo, Sagalla, Taita

(3) LACUSTRINE

LUHYA
N. Luyia: Saamia (E.34), Masaaba (E.31)
S. Luyia: Isuxa, Logooli (E.41)
EAST NYANZA/SUGUTI
SUGUTI: Jita (E.25), Kwaya (E.25), Ruri, Tegi
EAST NYANZA
EKEGUSII (E.42)
Kuria (E.43), Zanaki (E.44), Nata (E.45), Ngurimi, Shashi
INTER-LACUSTRINE
NORTH NYANZA: Ganda (E.15), Soga (E.16), Swere
RUTARA: Nyoro (E.11), Tooro (E.12), Chiga (E.14), Nyankore (E.13), Haya (E.22), Zinza (E.23), Nyambo (E.21), Kerewe (E.24)
WESTERN HIGHLANDS: Rundi (D.62), Rwanda (D.61), Ha (D.66), Vinza (D.65), Hagaza (D.65), Shubi (D.64)

The (phonemic) consonant and vowel inventories of Ekegusii are given in (4) and (5) respectively.

(4)

	t		k
b	d		g
		č	
	s		
m	n		ŋ

(5)

	i	u
	e	o
	ɛ	ɔ
	a	

Synchronically, the three voiced stops [b,d,g] all alternate regularly with [β,r,ɣ] respectively, the former found after a nasal, while the latter are found word-initially or post-vocalically.[1]

(6) a. ɔ́-rɔ́-βéèrè 'breast'
chíí-m-βéèrè 'breasts'

b. ɔ́-kɔ̀-rɔ́ɔ̀t-à 'dream' (v)
chíí-n-dɔ́ɔ̀t-ò 'dream' (n)

c. ó-rò-ɣùùnchárá 'horn'
chíí-ŋ-gùùnchárá 'horns'

The Proto-Bantu segment inventory given by Guthrie 1967 is listed in (7) and (8) for consonants and vowels respectively.[2] (Modern Ekegusii reflexes, where they uniformly differ from the proto-sounds, are shown to the right.)

(7)

*p > ∅	*t	*k
*b	*d	*g
	*c > s	
	*j > č	
	*y	
*m	*n	*ŋ

(8)

*i̱ > i	*u̱ > u
*i > e	*u > o
*e > ɛ	*o > ɔ
*a	

Examples of the historical sound changes are given for vowels and consonants in (9) and (10)) respectively.

(9)

SOUND CHANGE	EXAMPLES
*i̱ > i	éè-n-gì 'fly' < *gi̱; á-mà-rìβà 'pool' < *di̱bà
*i > e	ó-βò-βé 'evil' < *bí; é-ɣè-té 'stick' < *tí
*e > ɛ	ɔ́-kɔ̀-ɣèènd-à 'go' < *gènd; á-mà-βéèrè 'milk' < *béédè
*u̱ > u	rí-βú 'ashes' < *bu̱; ó-kò-rùm-à 'roar' < *du̱m
*u > o	ó-kò-ɣòrò 'foot' < *gùdù; é-ngòmà 'wound' < *gùmà
*o > ɔ	ɔ́-kɔ̀-rɔ́ɔ̀t-à 'dream' < *dóót; rí-rɔ̀βà 'soil' < *dòbà
*a > a	á-mà-rìβà 'pool' < *di̱bà; é-ngòmà 'wound' < *gùmà

(10)

*p > ∅	ɔ́-kɔ̀-ér-á 'be finished' < *péd; á-mà-éémbá 'sorghum' < *pémbá
*t > t	ɔ́-kɔ̀-rɔ́ɔ̀t-à 'dream' < *dóót; é-ɣè-té 'stick' < *tí
*k > k	ó-mò-kérà 'tail' < *kídà; ó-βò-túkó 'night' < *tu̱kù
*b > b/N _	é-m-bèβà 'rat' < *bìbà
*b > β (elsewh.)	á-mà-rìβà 'pool' < *di̱bà; á-mà-βéèrè 'milk' < *béédè
*d > d/N _	éè-n-dà 'stomach' < *dà;
*d > r (elsewh.)	ɔ́-kɔ̀-rɔ́ɔ̀t-à 'dream' < *dóót

*g > g/ N _ éè-n-gì 'fly' < *gi̱;
*g > ɣ (elsewh.) ɔ́-kɔ̀-ɣɛ̀ɛ̀nd-à 'go' < *gènd
*c > s éè-n-sé 'country' > *cí; ó-kò-βís-á 'hide' > *bi̱c
*j > č ó-rò-čárá 'fingernail' < *jádá; ó-mò-čì 'village' < *jì
*y > y / N_ ó-kò-nyw-à 'drink' < *nyú; é-n-yàmà 'meat' > *yàmà
*y > ∅ (elsewh.) ó-ˈmw-ááná 'child' < *yánà; ó-yò-ítá 'kill' > *yít
*m > m ó-kò-rùm-à 'roar' < *du̱m; é-ngòmà 'wound' < *gùmà
*n > n ó-kò-βún-á 'break' < *bu̱n; ó-ɣò-káàn-à 'deny' <*káán
*ŋ > ŋ é-ŋɔ̀ɔ̀mbɛ̀ 'cow' < *ŋòmbè

Let us now consider the forms for which I will argue that metathesis has applied historically. All the forms thus far discovered which exhibit this are given in (11).

(11) a. ó-kò-βàɣà 'divide' < *gàb-a
~ ?ó-kò-ɣàβà
b. mà-rɔ̀ɣɔ̀ɔ̀βà 'evening' < *gòdòbà
~ ?mà-ɣɔ̀rɔ̀ɔβà
c. é-kì-ɔ́ɣé 'eyelash' < *kópé
d. rí-ˈúɣá 'bone' < *ku̱pà

In (11a-b) the initial *gVC sequence has become CVɣ in an apparent metathesizing of the two consonants over the intervening vowel. I note here that while all three of my consultants use the forms whose roots begin with β and r, respectively, two of the three state that they have heard the form where the root begins with a ɣ and find it acceptable. Both felt this might be a dialectal difference.[3] In (11c-d) the *kVp sequence has become Vɣ. (There is no variant pronunciation of these forms.) I will show below that some type of metathesis must be involved with these forms as well, since*k has k and ɣ reflexes in Ekegusii, but not ∅, and *p deletes in this environment.

3. Motivating metathesis

Let us first consider the forms in (11a-b). The first thing which should be pointed out is that Ekegusii is the only Bantu language of which I am aware where these forms exhibit a diachronic metathesis with respect to the Proto-Bantu forms. Given this fact and the variable pronunciation of (11a-b) we infer that in historical terms, this process is probably a relatively recent one. The following show the reflexes of these Proto-Bantu forms in languages fairly closely related to Ekegusii. None of them exhibit the metathesis evident in the forms in (11).[4]

(12)*gàb 'divide'

a. gaβ Nyoro (E.11), Nyankore (E.13)
b. ɣay Kikuyu (E.51)
c. gaβǫr Logori (E.41)
d. gab Luganda (E.15) 'give away, divide' (Murphy 1972)
e. kaβ Bukusu (E.31) (Mutonyi p.c.)
f. gabanya Kirundi (D.62) (Stevick 1965)

g. ɣaβ   Kikuria (E.43) (Muniko 1996)

(13) *gòdòbà 'evening'

a. umu-goroβa   Kirundi (D.62)
b. iŋ-goloβe   Luhya (E.32a)(< *-gòdòbè)
c. eggulo   Luganda (E.15) (<*gùdò)
d. aa-kolooβa   Bukusu (E.31) (Mutonyi p.c.)
e. omo-goro:ba   Kikuria (E.43) (Muniko 1996)

In (11a-b) the root-initial voiced velar of the proto-form has apparently metathesized with the following *b or *d over an intervening vowel. It is clear, however, that not all *gVb and *gVd forms have reflexes exhibiting metathesis. Ekegusii forms with a root-initial *g* which do not metathesize with a following *b* or *r* (< *d) are shown in (14a-c):

(14) a. é-n-gùβà   'shield' *gụ̀bà
é-n-gòβɔ̀   'cloth' *gùbò
é-n-gùβó   'hippo' *gụ̀bú
b. έ-n-gɔ̀rí   'string' *gòdị̀
číí-n-gùrù   'strength' *gụ̀dụ̀
é-n-gùrúè   'pig' *gụ̀dụ́
c. ìɣɔ̀rɔ̀   'yesterday' *gòdò
ó-kò-ɣòrò   'foot' *gùdù
ó-kò-ɣòrà   'buy' *gùdà

One obvious difference between (11a) and (14a) is that the reflex of root-initial *g in (11a) is preceded by a vowel whereas in a) it is preceded by a consonant. (11b) is distinguished from the forms in (14b) in the same way. It is less clear how to distinguish (11b) from the forms in (14c) where no metathesis occurs, especially as we compare (11b) *mà-rɔ̀ɣɔ̀ɔ̀βà* (< *gòdòbà) to *ìɣɔ̀rɔ̀* 'yesterday' (< *gòdò). The generalization about what distinguishes (11a-b) from the forms in (14a-c) seems to be that the forms in (11a-b) have a *g which is 1: preceded by a V, and 2: followed later in the word by a *b, as illustrated schematically below.

(15)
$$\underset{1}{V}\ \underset{2}{g}\ \underset{3}{V}\ \underset{4}{\begin{Bmatrix} Cxb \\ b \end{Bmatrix}} \implies 1432$$

We refine the formalization of this below.

Let us now turn to the forms in (11c-d), repeated below.[5]

(16) c. é-kì-ɔ́ɣέ   'eyelash' < *kópé
d. rí-ˈúɣá   'bone' < *kụ́pà

The Proto-Bantu words have the form *kV_1pV_2 which is realized in modern Ekegusii as V_1ɣV_2. Again, closely related languages show no metathesis of the reflexes of these two proto-forms.

(17) *kópé 'eyelash'

a.	ŋ-gɔβɛ	Kamba (E.55)
b.	o̩lo̩-gɔhɛ	Logooli (E.41)
c.	lu-koβe	Giryama (E.71)
d.	lu-gohe	Sukuma (F.21)
e.	ŋ-gohe	Taita (E.14d)
f.	oru-kohi	Nyoro (E.11) (<*kópi̩)
g.	or-gohe	Nyankore (E.13) (<*kópi̩)
h.	olu-góye	Jita (E.25) (Downing 1989)
i.	ru-kobe	Kikuyu (E.51) 'eyelid' (Benson 1964)
j.	eki-kowe	Luganda(E.15) 'eyelid'
k.	iki-gohe	Kirundi(D.62) 'eyelid'
l.	ẹkẹ-gɔhɛ	Logoori(E.41) 'eyebrow'
m.	oro-koβe	Kikuria (E.43) (Muniko 1996)

(18)*ku̩pà 'bone'

a.	i-fwao	Hai (E.62)
b.	i-gufa	Nyoro (E.11)
c.	i-guha	Sukuma (F.21)
d.	li-gufwa	Jita (E.25) (Downing 1989)
e.	i̩-gufa	Kirundi (D.62) (Stevick 1965)
f.	m-fuβa	Digo (E.73), Segeju (E.56) (Hinnebusch & Nurse 1993)
g.	iri-ɣuha	Kikuria (E.43) (Muniko 1996)

(Note that k → f/ _ u̩ is a regular historical process in Hai, Digo and Segeju.)

Let us begin by considering the reflexes of *p in Ekegusii. There is ample evidence that the modern Ekegusii reflex of *p is ∅ in nearly every environment. We see examples of this below, both in cases where *p is stem-initial (19a) and stem-final (19b).[6]

(19) a.	ɔ́-kɔ̀-ér-á	'to be finished'	*péd-a
	á-mà-ɛ́ɛ́mbá	'sorghum'	*pémbá
	á-ˈmá-írá	'pus'	*pi̩dà
	rîî-úró	'foam'	*pu̩dù
	é-ùnkɔ̀	'mole'	*pùkò
	ó-mò-ùkɔ̀	'blind person'	*pòku̩
	rîî-ótɛ́	'wound'	*púté
	ó-ɣò-àk-à	'to rub'	*pàk-a
	ó-gò-ìk-à	'arrive'	*pi̩k-a
	ó-gò-ét-á	'pass'	*pít-a
b.	ɔ́-kɔ̀-bɔ́-á	'bind'	*bóp-a
	ó-mò-kìà	'vein'	*ki̩pà
	ɔ́-ɣɔ̀-kɛ́ɛ̀-à	'be small'	*kéép-a
	ɔ́-kɔ̀-rɛ̀ɛ̀-à	'be deep'	*dèèp-a
	ó-gò-túùà	'be blunt'	*tu̩u̩p-a
	ó-kò-ìòrà	'take off fire'	*yi̩pud-a

Before a sequence of *iV or *i̯V, *p becomes a voiced palatal fricative as seen in (20). (Cf. Digo *igi-su*, Giryama *ki-šu* for 'knife' and Nyankore *-sy-*, Rundi *-šy-* for 'be burnt'.)

(20)	a.	ó-kò-žy-á	'be burnt'	*pí-a
	b.	ó-mò-žyó	'knife'	*pi̯ú

In these forms I assume that *i glided before a following vowel and that the *p became ž before y.

After a nasal, *p sometimes became *b and sometimes deleted.

(21)	a.	ɛ́ɛ̀-m-bɛ́ɔ́	'wind'	*ny-pépò
	b.	é-ǃny-íɣó	'kidney'	*ny-pi̯gù
		é-ny-ìɪmbɔ́	'stick'	*ny-pi̯mbò

I would like to propose that the difference between the retention versus the deletion of the bilabial stop is conditioned by the following vowel. In a variety of related languages where the reflex of *p is generally ∅, it mutates rather than deletes before *i̯ (and *u̯). This is true, e.g., in Meru, Hai, and Sagala among others (Guthrie 1967). To account for (21b) I assume that in Ekegusii *p became ž before both y (cf. (20a)) and i̯. Subsequently, ž lost its frication after a nasal, nž becoming ny (and then perhaps [ñ]). (E.g., *ny-pi̯gù 'kidney' > nžíɣó > nyíɣó.) Remaining ž's disappeared, except before a glide, as attested synchroncially in (20). (E.g., *pi̯k-a 'arrive' > žík-á > ík-a; but *pí-a 'burn' > py-á > žy-a.) In the case of (21a), like many neighboring languages, Ekegusii *mp sequences become mb (Cf. Logoori, Hanga, Kamba among others; Guthrie 1967)). Of course, given the above proposal, this post-nasal voicing neutralization would occur after *p > z.[7]

There is a single somewhat anomalous case where *p appears to have a ɣ reflex in modern Ekegusii.

(22)	ó-mw-ìɪɣwà	'nephew'	*yi̯púá

After the process which turns the *u to w (conditioned by the following vowel), the form in (22) could be accounted for by a rule which changes *p to g (> ɣ) before w, as given below.[8]

(23) *p → g / __ w

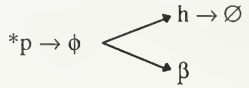
In other related languages, the presence of a derived glide also conditions a different reflex of *p than the one normally found elsewhere. For instance, Kikruia is similar to Ekegusii in that *p is realized as h, however in this form the velar is found, *umwiiɣwa*. In Logoori, the reflex of *p is generally h, however before a glide we find ɸ (*yi̯púá > *ọmwi̯ɸwa* 'uncle'). However one ultimately formalizes this process, it doesn't seem possible to formulate it such that it would account for a change from *p to ɣ in the forms in (11c-d). First, this wouldn't account for the absence of the root-initial velar, and second, it does not seem possible to formulate a trigger for this change in (11c-d) while still accounting for the deletion of *p in similar environments, as seen in (19b).

Let us now briefly consider the fate of *p in closely related languages. These are given below.

(24)	a.	Nyankore (E.13)	h
		Luganda (E.15)	w,y [9]
	b.	Kerewe (E.24)	h
		Jita (E.25)	h
	c.	Hanga (E.32)	h
	d.	Logoori (E.41)	h
		EKEGUSII *(E.42)*	∅
		Kikuria (E.43)	h
		Nata (E.45)	h
	e.	Kikuyu (E.51)	h
		Embu (E.52)	β
		Meru (E.53)	∅
		Kamba (E.55)	β
		Daiso (E.56)	∅
	f.	Rwo (E.61)	∅
		Hai (E.62)	∅
		Kahe (E.64)	ɓ
		Gweno (E.65)	∅
	g.	Pokomo (E.71)	ɸ
		Giryama (E.72)	h
		Kauma (E.72)	β
		Taita (E.74)	∅
		Sagala (E.74)	∅

A possible scenario of historical changes of *p which would account for the vast majority of these reflexes is given in (25).

(25)



Whatever the exact changes were, it seems quite likely that *p eventually became some sort of fricative, ultimately h, as a shared innovation involving Ekegusii and closely related languages. This was then followed by a wholesale loss of that fricative in Ekegusii. It is unclear whether the loss of the fricative in Meru, Daiso and others was a shared innovation or (and perhaps more likely) whether this happened independently in several languages. To conclude this point, if the change from *p to h is a shared innovation with closely related languages, but metathesis is not (as it is found only in Ekegusii), then we hypothesize that *p > h preceded metathesis. We return to this below.

Let us now turn to the realization of *k in (11c-d). Since we have fairly good evidence of some type of metathesis process operating in (11a-b), let us consider the possibility that some type of metathesis process involving *k is also

at work in (11c-d). Ordering h (< *p) deletion sequentially with some sort of metathesis yields two possibilities, both yielding the same output, as outlined below.

(26)	*kópé	*kʊ́pà	Proto-form
	kɔ́pé	kúpá	Vowel and Tonal (V&T) changes
	kɔ́hé	kúhá	*p > h
	kɔ́ɛ́	kúá	h > ∅
	ɔ́kɛ́	úká	Metathesis of k and V
(27)	*kópé	*kʊ́pà	Proto-form
	kɔ́pé	kúpá	V&T-changes
	kɔ́hé	kúhá	*p > h
	hɔ́kɛ́	húká	Metathesis of h and k
	ɔ́kɛ́	úká	h > ∅

In order to achieve the attested VCV output of (11c-d), in) the metathesis process would need to affect the *k* and the following ɔ or *u*, while in) it would affect the two consonants (over an intervening vowel), as it seems to do in (11a-b).

4. Dahl's law

The first thing we note about the scenario presented in (27) is that both orderings yield a form in which the velar is voiceless, whereas in the modern Ekegusii form it is voiced. That there is no general process which would voice a velar between vowels can be seen in the following.

(28)	ó-kò-rók-á	'to vomit'	*rúk-a
	éè-n-čóké	'bee'	*júkì
	ó-βò-tàkà	'poverty'	*tàkà

How, then, did the velar become voiced? The analysis we will pursue here is that the voicing is a result of a well known voicing process which occurred in certain Bantu languages (confined to the northwest corner of the Bantu speaking area) known as Dahl's law. Dahl's law is the name of a dissimilatory process which, in its most general form, voices the first of two voiceless obstruents (which, of course, are always separated by an intervening vowel). According to Guthrie 1967, languages which show some effects of Dahl's law are found within his Zone's E20-E50, F20 and G60.

Bennett 1967, Davy & Nurse 1982 and others have clearly demonstrated that languages vary a great deal as to which particular consonants undergo the rule, which consonants trigger the rule, and how the rule effects multiple targets within the same word. Languages also differ as to whether there is any evidence that the rule is operative synchronically. According to Guthrie 1967, languages in which *p, *t, and *k were historically affected include Logooli (E.41), Luyha (E.32), Kerebe (E.24) and Sukuma (F.21). In other languages, a smaller subset of sounds was affected. Only *p and *t are affected in Hehe (G.62), only *p is affected in Kinga (G.65), and only *k is affected in Kikuyu (E.51) and Embu

(E.52). In Ekegusii, there is robust evidence that Dahl's law affected *k diachronically.

(29)	ɔ́-kɔ̀-ɣɛ̀s-à	'harvest'	*kèc-a
	ó-kɔ̀-ɣɔ̀t-à	'be old'	*kòt-a
	ó-kɔ̀-ɣwáàt-à	'hold'	*kụ́át-a 'sieze'
	á-mà-ɣɔ́kɔ́	'crust'	*kókò
	ó-mò-ɣáàkà	'old man'	*kàaka 'grandfather'

That this voicing process was triggered by a following voiceless consonant and did not apply across the board historically to root-initial velars can be seen below.

(30)	ó-βɔ̀-kímá	'porridge'	*kị́mà
	rîi-kóβù	'navel'	*kúbụ̀
	ɔ́-βɔ̀-kɔ́ɔmbɛ́	'hoe'	*kómbè
	ó-ɣò-kám-á	'to milk'	*kám-a

This process is still quite productive in the synchronic phonology of Ekegusii as exemplified by the class 15 prefix /ko-/ in the forms below.

(31) a.	ɔ́-kɔ̀-rɔ́ɔ̀t-à	'dream' (v)
	ó-kò-ɣòrò	'foot'
	ó-kò-nyw-à	'drink'
b.	ó-ɣò-káàn-à	'deny'
	ó-ɣò-túùà	'be blunt'
	ɔ́-ɣɔ̀-sɛ̀kà	'laugh'

Dahl's law did not affect *p, *t or *c in Ekegusii, as seen below.

(32) a.	ó-ɣò-àk-à	'rub'	*pàk-a
	ó-gò-ìk-à	'arrive'	*pị̀k-a
	ó-gò-ét-á	'pass'	*pít-a
b.	ó-ɣò-tákúnà	'chew'	*tákun
	ó-ɣò-twéèkà	'put up'	*túík-a
	ó-bò-tàkà	'soil'	*tàkà
c.	ó-ɣò-sɛ̀kà	'laugh'	*cèk-a

Assuming, then, that *k became voiced through Dahl's law in (11b-c), let us reconsider the historical derivations in) and) with an eye to ordering Dahl's law among the other historical processes. In order to insure that the *k of c-d) is voiced, Dahl's law must apply before both *h-Deletion and Metathesis. If *h-Deletion applied before Dahl's law, the trigger of Dahl's law would be lost.

(33)	*kópé	*kụ́pà	Proto-form
	kɔ́pɛ́	kúpá	V&T-changes
	kɔ́hɛ́	kúhá	*p > h
	kɔ́ɛ́	kúá	h > ∅
	—	—	Dahl's law
	*ɔ́kɛ́	*úká	Metathesis of k and V

If metathesis applied before Dahl's law, it would be the h (< *p) (instead of the *k) which was the target of voicing.

(34)	*kópé	*kṵ́pà	Proto-form
	kɔ́pé	kúpá	V&T-changes
	kɔ́hé	kúhá	*p > h
	hɔ́ké	húká	Metathesis of h and k
	ɦɔ́ké	ɦúká	Dahl's law[10]
	*ɔ́ké	*úká	h/ɦ > ∅

That Dahl's law must apply before both *h-Deletion and Metathesis, then, accords with the fact that both h-Deletion and Metathesis seem to be relatively recent innovations, not being shared with related languages, whereas Dahl's law is a shared innovation of quite a number of languages. Let us now consider the ordering of *p > h. As this was a shared innovation, let us assume that it is ordered before metathesis (as well as h-deletion, of course). The remaining question is how it is ordered with respect to Dahl's law. Both possible ordering yield the same output as shown below.

(35)	*kópé	*kṵ́pà	Proto-form
	kɔ́pé	kúpá	V&T-changes
	kɔ́hé	kúhá	*p > h
	ɣɔ́hɛ	ɣúhá	Dahl's law

(36)	*kópé	*kṵ́pà	Proto-form
	kɔ́pé	kúpá	V&T-changes
	ɣɔ́pé	ɣúpá	Dahl's law
	ɣɔ́hé	ɣúhá	*p > h

After the application of Dahl's law and *p > h, metathesis and *h-deletion will apply. The correct modern-day forms can be generated with either ordering, although what metathesizes is different in each case as shown below.

(37)	ɣɔ́hé	ɣúhá	Result of Dahl's law and *p > h
	hɔ́ɣé	húɣá	Metathesis of g and h
	ɔ́ɣɛ	´úɣá	*h > ∅

(38)	ɣɔ́hé	ɣúhá	Result of Dahl's law and *p > h
	ɣɔ́é	ɣúá	*h > ∅
	ɔ́ɣɛ	´úɣá	Metathesis of g and following V

There are two reasons to think that the best analysis is the one in (37). First, metathesis of two consonants over a vowel parallels what is going on in (11a,b) where no CV metathesis analysis is possible. The second reason is the existence of forms such as the one in (39), where *g does not metathesize with a following V.

(39)	ó-kò-ɣwà	'fall'	*gù-a

5. Providing a formal account

We note here that not all *k ... p sequences metathesize. Those that do not are listed in).[11]

(40)	a.	ó-mò-kìà	'vein'	*kɻ̀pà
	b.	ɔ́-ɣɔ̀-kɛ́ɛ̀-à	'be small'	*kéép-a

These forms, where the root-initial *k does not get voiced, contrast minimally with the forms in (11c-d) where we assume Dahl's law has applied, and therefore preclude an analysis where, e.g., every *kVp undergoes Dahl's law becoming gVp which would feed p > h and metathesis yielding hVg which becomes Vg after h-deletion. Such a scenario is not possible due to the fact that the initial voiceless velar undergoes Dahl's law in (11c-d), but not in (40a-b). How can this be accounted for?

I will now present and evaluate four possible analyses which account for the differing behavior of (11c-d) with respect to (40a-b), ultimately adopting the final one. I will suggest that it is the quality of the vowel between the two consonants (specifically roundness) which plays a role in differing behavior of the two sets of forms.

First, one could assume that *p (> h) did not trigger Dahl's law in Ekegusii at all (i.e., Dahl's law would only be triggered by the reflexes of *t, *k and *c). This would directly account for the forms in (40). However, another explanation for the voicing of *k in (11c-d) would then have to be found. Yet it is unclear how this could be accomplished short of combining the voicing *k in these cases with the already unusual metathesis process. The likelihood and phonetic plausibility of this scenario must be compared with alternatives to be presented below.

The second and third possible analyses directly exploit the difference in the vowels which occur in (11c-d) as opposed to those in (40). Specifically, the former are back rounded vowels while the latter are front unrounded vowels. In the second possible analysis, *p triggers Dahl's law only when the intervening vowel is a rounded (or alternatively back) vowel. This would explain why *k voices in (11c-d), but not in (40). Metathesis would then only apply when *ɣ* (as opposed to *k*) is the first consonant.

(41)	*kópé	*kúpà	*kɻ̀pà	*kéép-a	Proto-form
	kɔ́pé	kúpá	kìpà	kɛ́ɛ̀pà	V&T-changes
	kɔ́hé	kúhá	kìhà	kɛ́ɛ̀hà	*p > h
	ɣɔ́hé	ɣúhá	—	—	Dahl's law
	hɔ́ɣé	húɣá	—	—	Metathesis
	ɔ́ɣé	úɣá	kìà	kɛ́ɛ̀à	h-deletion

However, we must now ask whether it is possible to maintain this second hypothesis on comparative grounds. Are there other languages affected by Dahl's law where under certain circumstances *p (or a reflex) is not an automatic trigger? Let us consider three languages in this regard (as described by Guthrie 1967-70:1) Logoori (E.41) where *p, *t, and *k are targets, 2) Kikuyu (E.51)

where, like Ekegusii *k is the only target, and 3) Hanga (E.32) where *p and *k are targets.

In Logoori we find that *p triggers Dahl's law for *p, *t, and *k, as shown in).

(42)	a.	βẹh	'wipe'	*píp
	b.	ọβọ-dɔhẹ	'mud'	*tòpè
	c.	ọlọ-gɔhɛ	'eyelash'	*kópé

In Kikuyu, we find that while *k voices when the following consonant is *t, *c or *k, it fails to voice before *p.[12]

(43)	a.	mọ-ɣatɛ	'bread'	*kàté
		ɣeek	'put across'	*kíík
		ɣɛð	'harvest'	*kèc
	b.	mọ-kiha	'vein'	*kị̀pà
		kụhẹ	'short'	*kṵ́pí

In Hanga, we find that *p triggers Dahl's law for *p, but not for *k.

(44)	a.	olu-βaha	'wing'	*pàpá
	b.	ikwaha	'armpit'	*kú-ápà

We see, then, that while *p behaves regularly with the other voiceless obstruents in triggering Dahl's law in some languages (e.g., Logoori), there are certainly cases where *p acts exceptionally in not triggering Dahl's law, in contrast to the other voiceless obstruents which do trigger it (e.g., Kikuyu). In the one case where *p sometimes triggers this process and sometimes does not, the determining factor is the place of articulation of the target consonant, and not the intervening vowel. Thus, while this second analysis, where Dahl's law applies over certain vowels, but not others, makes the correct predictions in Ekegusii, it finds no precedent elsewhere in Bantu.

This brings us to the third possible analysis, in which the backness (or roundness) of the vowel does not figure in triggering Dahl's law directly, but rather figures in the process in which h (< *p) is deleted. Specifically, one way to account for the facts is to assume that not all h's were deleted simultaneously, but rather that h's were deleted in two stages. The first, preceding both Dahl's law and metathesis, would only delete h's after front (or alternatively unrounded) vowels. The second rule, following Dahl's law and metathesis, would delete all remaining h's. This is illustrated below.[13]

(45)	*kópé	*kṵ́pà	*kị̀pà	*kéép-a	Proto-form
	kɔ́pé	kúpá	kìpà	kéɛ̀pà	V&T-changes
	kɔ́hé	kúhá	kìhà	kéɛ̀hà	*p > h
	—	—	kìà	kéɛ̀à	Post-front V h-del
	ɣɔ́hé	ɣúhá	—	—	Dahl's law
	hɔ́ɣé	húɣá	—	—	Metathesis
	ɔ́ɣé	úɣá	—	—	h-deletion

It should be pointed out here that it is unclear in Ekegusii, as it is in other Bantu languages, exactly how Dahl's law developed historically. The process is uncommon enough that it certainly seems like a shared historical innovation in the Bantu languages which exhibit it. What seems less clear, however, is what form the process originally took. It is quite possible, for instance, that Dahl's law originally involved only a single trigger and target (e.g., *k ... *k) and that as time went on this was generalized in different ways in the various daughter languages. In the case of Ekegusii it is possible that the voicing of *k before *k (and perhaps before *t and *c, as well) happened before Post front V h-deletion (or even concurrently with it). Thus, the above scenario does not depend on every subpart of Dahl's law applying after Post front V h-deletion, but only the process in which h (<*p) comes to act as a trigger.

Under the assumptions of the second and third analyses, the sounds undergoing metathesis are a root-initial ɣ and an h. Let us now attempt to combine the formulation of this process with the one taking place in a) where ɣ is metathesized with b over an intervening vowel. The forms in (11a, c, d) could be accounted for by an SPE style rule such as the following:

(46) V ɣ V {β, h} → 1 4 3 2
1 2 3 4

Let us review the various parts of this rule. That metathesis only occurs when the first C is preceded by a vowel is demonstrated by the forms in). That the first consonant is ɣ, and not (for example), any velar, can be seen by considering the following.

(47)	rîi-kóβù	'navel'	*kúbù
	é-rì-kòβè	'vegetable'	*kùbì

That the trigger cannot be any consonant, but rather must be either β or h, can be seen by examining the following.

(48)	ó-kò-gèèndà	'go'	*gènd
	ó-kò-gòrà	'buy'	*gùd
	ó-mò-gànò	'story'	*gàn
	ó-bò-gìmà	'life'	*gì̩mà
	ó-kò-gòrò	'foot, leg'	*gùdù
	á-mà-gútá	'oil'	*gú̩tà
	ó-kò-gàčà	'keep'	
	ó-kò-gànyà	'wait'	
	ó-kò-gòòkà	'be happy'	
	ó-kò-gósóryà	'play'	

(For evidence that metathesis did not apply to all instances of *k changed to ɣ by Dahl's law, see (29).)

Characterizing β and h to the exclusion of the other consonants is not a trivial matter. What distinguishes β and h articulatorily from the other Ekegusii consonants is that no part of the tongue is used in their articulation. In terms of

boiling this down to SPE features, we could employ [coronal, -high]. We can therefore revise (46) into (49).

(49) V ɣ V [-cor] → 1 4 3 2
[-hi]
1 2 3 4

In terms of more modern notions of feature geometry (Clements 1985, Clements 1989, Clements & Hume 1995), it seems difficult to characterize β and h as a natural class, as β involves the use of the LABIAL articulator, while h is characterized by the lack of any PLACE node. This, then, is perhaps a drawback of this analysis.

In a fourth possible analysis, the roundedness of the vowels preceding h in (11c-d) spread onto the h, making it phonologically rounded, as illustrated in (50).[14] In this case, roundedness would be executed by a LABIAL node, making β and h^w (ʍ) a natural class.

(50) V h
\ /
LAB

Metathesis, then, could be said to operate on a ɣ and a following non-nasal consonant with a LABIAL node.[15]

(51) LAB
|
V ɣ V C
|
[-nas]
1 2 3 4 → 1 4 3 2

Under this analysis, which posits an intermediate stage with two variants of h (determined by the roundness of the previous vowel), there would actually be no need for two h-deletion rules, something which had to be employed in the third analysis to explain why Dahl's law was triggered in some kVh forms, but not others. In this fourth analysis we can assume that only obstruents with a PLACE node (i.e., labialized h's, but not plain h's) triggered Dahl's law.

(52) Dahl's law

k → ɣ / __ V C
[-vd]
|
PLACE

This is illustrated below.

(53)	*kópé	*kúpà	*kp̀à	*kéép-a	Proto-form
	kópé	kúpá	kìpà	kéɛ̀pà	V&T-changes
	kóhé	kúhá	kìhà	kéɛ̀hà	*p > h
	kóh^{w}é	kúh^{w}á	—	—	h-labialization
	ɣóh^{w}é	ɣúh^{w}á	—	—	Dahl's law

hʷɔɣɛ́	hʷúɣá	—	—	Metathesis
ɔɣɛ́	úɣá	kìà	kɛ́ɛ̀à	h-deletion

I note here that the place of articulation requirement on the trigger in Dahl's law is not unusual, as we noted earlier that Dahl's law often has strict place requirements on the trigger and/or the target obstruents. It bears pointing out again here that Dahl's law could have actually begun to operate prior to the *p > h and h-labialization rules. For instance, it is possible that prior to these two processes, Dahl's law was in force, but, as in closely related Kikuria and Kikuyu, was triggered only by non-labials (i.e., *t, *c, and *k). This would explain why the k in the Ekegusii forms in (53) did not voice when Dahl's law was originally introduced. Working under this assumption, I would claim that at some point after *p > h, Dahl's law became synchronically one of k becoming voiced when followed by a voiceless C with a place node, accounting for the fact that the labialized h triggered the rule, but the plain h did not.

It seems, then, that the rule as formulated in (51) successfully accounts for three of the four cases of metathesis (11a,c,d). What of (11b) *mà-rɔ̀gɔ̀ɔ̀bà* 'evening' (< *gòdòbà)? In this case the non-metathesized alternate pronunciation is *mà-gɔ̀rɔ̀ɔ̀bà*. As mentioned earlier what seems to distinguish this form from the ones in which no metathesis occurs in (15b), repeated below as (54) is that a labial follows in the word in the former, but not in the latter.

(54)			
	ìɣɔ̀rɔ̀	'yesterday'	*gòdò
	ó-kò-ɣòrò	'foot'	*gùdù
	ó-kò-ɣòrà	'buy'	*gùdà

One possibility here would be to formulate the metathesis rule such that a ɣ metathesizes with the following consonant, as long as there is a LABIAL under C-PLACE (cf. Clements 1989, Clements & Hume 1995) in the word, i.e., as long as there is a following consonant with a labial gesture, whether this gesture be the primary (i.e., β) or secondary (i.e., hʷ) place of articulation. It would not be sufficient to include simply LABIAL, as the presence of a rounded vowel does not trigger the metathesis (cf. (54)). This is illustrated in (55).

(55)

DORS		C-LAB	
|		|	
V	ɣ	V	C
1	2	3	4 → 1 4 3 2

To account for the fact that metathesis occurred obligatorily in (11c-d), but optionally in (11a-b), we assume that the rule was originally triggered (obligatorily) only by a voiceless consonant.

(56)

DORS	C-LAB	
|	|	
V	ɣ V	C
	[-vd]	
1	2 3	4 → 1 4 3 2

For some dialects (including those spoken by my consultants) the [voicing] specification was lost as well as the requirement that the consonantal labiality be on the immediately following consonant.

6. Summary and conclusion

In this paper, I have presented synchronic data from Ekegusii which I have argued are best accounted for by positing a fairly recent diachronic process of metathesis which affected a velar and a following consonant. This is of comparative and theoretical interest, as metathesis is a fairly uncommon occurrence cross-linguistically in general and in Bantu in particular. The uncommonness is further compounded by the fact that the process is not a local one, but affects nonadjacent segments, and does not appear to be motivated by prosodic considerations (e.g., as a strategy for "repairing" ill-formed syllables created by some other process).[16] In the course of formalizing this process, we examined the developments in *p and *k in the history of Ekegusii as well as the diachronic application of Dahl's law. While it is well known that place of articulation often plays a role in determining which obstruents trigger and/or undergo this process, I have suggested that the presence of a secondary articulation may also play a role. In particular, in order to explain why Dahl's law was triggered in certain reflexes of *kVp, but not others, I suggested that in the course of *p changing to h, rounding was maintained after rounded vowels, and only laryngeals with a secondary place node (LABIAL in this case) could act as triggers of Dahl's law.[17]

NOTES

* I would like to thank my language consultants, Robert Ndemo Achenchi, Pam Otwori Achenchi, and Jason Okindo from whom all the Ekegusii data was elicited. Additionally, in preparing this paper I benefited from discussions with Derek Nurse, Thilo Schadeberg, Larry Hyman, Aaron Broadwell, and John Justeson. Any errors or inconsistencies are entirely my own.

[1] As is the case in all Bantu languages, Ekegusii nouns are divides into various classes, which are often comprised of a singular and plural pair. The morphological marker of the class is prefixed onto the root. Ekegusii is part of the group of Bantu languages which also have a 'preprefix' or 'initial vowel'. Thus the complete morphological structure of the words to be presented is: Preprefix-Class Prefix-Root. In the interest of space, the numerical designation of the class marker will be omitted (as they have no bearing on the analysis presented), but hyphens will consistently be used to indicate these morpheme boundaries. (In the case of the noun in (6b), the -o is a deverbal nominalizing suffix.)

[2] All Proto Bantu forms and sounds given in this paper are taken from among the starred "comparative" forms in Guthrie 1976-71.

[3] Derek Nurse (p.c.) informs me that the Gusii speaker he is currently working with also uses *ó-kò-βàɣà* and *mà-rɔ̀ɣɔ̀ɔ̀βà* (the metathesized forms), but has heard *ó-kò-ɣàβà* and *mà-ɣɔ̀rɔ̀ɔβà* (the unmetathesized forms) used. For (11c-d) only *é-kì-ɔ́ɣɛ́* and *rí-ˈúɣá* are possible.

[4] All forms from other languages are taken from Guthrie 1967-70 unless otherwise noted.

[5] In Kikuria, a very closely related language, the verb 'build' has two possible pronunciations: *gahaacha* and *-hagaacha* (Muniko et al. 1996). It is not entirely clear whether these represent differing dialects of Kikuria, or whether they might be in free variation for some speakers. The Ekegusii infinitival form for this word is *oko-agaacha*. It seems quite possible based on these forms that the proto form for 'build' for Proto-Ekegusii/ Kikuria might be *kapaac. If so, then this form would be an additional example of the type of metathesis witnessed in forms (11c-d). Why it is that this form would have a variable pronunciation in Kikuria in contrast to the cognates for (11c-d) which do not remains a mystery.

[6] I simply note here, but do not have an explanation for the apparent metathesizing of the two vowels in 'blind person'. I.e. from *pòkù we would expect the reflex to be *ɔ̀kù* not *ùkɔ̀*.

[7] Interestingly, this change from *mp to ny (before j) does not appear to occur in any of the closely related languages. E.g., In Logoori the reflex of *ny-pígù 'kidney' is *ẹmpịgọ*. A different possibility for explaining the forms in (21b) would be to assume that these stems were originally in some other noun class of the shape CV. The *p would eventually delete, leaving vowel-initial stems. If these stems subsequently found their way into class 9, where the subject marker is a palatal nasal, the current synchronic forms would be explained straightforwardly. In the case of *pìmbò 'stick', this scenario seems possible as some related languages (e.g. Nyooro, Nyankore) have this stem in class 11/10. After the class 11 marker *ro-* (<*du) the reflex would be *imbɔ*, which might then eventually replace the root in the class 10 form. Unfortunately, this scenario seems less likely for *pígù 'kidney' which seems to always occur in 9/10 in closely related languages.

[8] It should be noted that the process in (23) in all likelihood affected some subsequent development of *p, e.g. ɸ or h. These intermediate changes are discussed further below in the text.

[9] Disregarding complications that arise if *p is found after a nasal or *j, it becomes y before i, and w elsewhere. (When not morpheme peripheral, *p becomes s before *j (Hyman p.c.).)

[10] Perhaps Dahl's law would simply not apply here to create a voiced laryngeal of which there is no language internal or comparative evidence. This does not seem to be at all crucial as the next rule eliminates the laryngeal altogether.

[11] Additionally, no heteromorphemic *k...p sequences undergo metathesis (something which would have given rise to synchronic alternations). E.g. *ó-kò-ár-á* 'to scratch' (< ú-ku-pád-a), *ó-gò-ét-á* 'to pass' (< ú-ku-pít-a).

[12] This is also true in Kikuria.

[13] Another variation of the development in (45) would be that *p > ɸ, after which ɸ deletes only after front V's. Dahl's law would then be triggered by ɸ Subsequently ɸ > h, followed by metathesis and h-deletion.

[14] Thilo Schadeberg has suggested to me that rather than positing a rule which changes all *p's to h, followed by a rounding process, one could alternatively assume that when *p (or ɸ) became a laryngeal it simply retained its labialness (manifested as rounding) after rounded vowels and immediately or subsequently lost it after unrounded vowels. In either case what is crucial for my argument is that a distinction arose between a labialized and nonlabialized h.

[15] One issue which arises here is the phonological structure of NC sequences. No metathesis occurs between a velar and a following prenasalized labial. E.g., *ó-mò-gàámbì* 'leader', *é-gàámbo* 'conversation'. If NC is represented as two segments, then the rule in (51) will suffice. If NC is represented as a single complex segment, then further specification of the trigger C in (51) will be necessary (e.g. that it is [+continuant] or [-nasal]).

[16] One process (both diachronically and synchronically) within Bantu dubbed "imbrication" (Bastin 1983) is often analyzed as a kind of metathesis, but in that case the metathesizing elements are strictly adjacent. E.g., Ekegusii /tu-a-ka-berek-an-ire/ 'we just carried each other' → *twakaberekaine*, where the final V_1C_1-$V_2C_2V_3$ becomes $V_1V_2C_1V_3$, the C_1 and V_2 having been permuted.

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LANGUAGE MAINTENANCE AND LANGUAGE SHIFT IN BURKINA FASO: THE CASE OF THE KOROMBA

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The abundant literature published since the appearance of Fishman's *Language Loyalty in the United States* 1966 is primarily European and North American in perspective. Most studies have dealt with binary language contact situations (mainstream language vs. non-mainstream language) and with communities already having a long tradition of literacy. Very few have been devoted thus far to African communities. This paper offers a survey of the situation of language maintenance and shift in the multilingual and multiethnic setting of Burkina Faso (West Africa) and studies the particular case of a shifting community: the Koromba. It is shown that the language configuration in Burkina Faso today is the result of a long period of contact between people differing in language and customs. Language shift mainly occurred in communities with a centralized socio-political system, whereas language maintenance has prevailed in those communities with strong decentralized tendencies. The more detailed study of the Koromba shows that language maintenance and shift are permanently at work in Burkina Faso. The factors that determine maintenance or shift, although varying from one community to another, are primarily internal. More than numbers, territory seems to play a key role in language maintenance in communities with an oral tradition.

0. Introduction

Language maintenance and language shift, as contact phenomena, have received a considerable amount of attention since the publication of Fishman's 1966 pioneering work *Language Loyalty in the United States*. Studies on this topic have taken different perspectives (sociological and linguistic), and have mostly focused on European and North American settings. The contact situations that have been dealt with are essentially binary: mainstream language vs. non-mainstream language, English vs. Gaelic, indigenous or immigrant languages (Dorian 1973, 1981, 1989, Hoffman et al. 1972, Gal 1978, among others). Moreover, 'the negative side of the maintenance/shift continuum', as Fishman (1991: 397) rightly observes, has been 'over-attended', whereas the positive side (language maintenance) has been 'down-played'. The general picture that emerges from the literature is, therefore, that of the 'big fish swallowing the small fish' (Pandharipande 1992). It would seem that language contact is ineluctably detrimental to immigrants and minority languages. Another observation that can be made about the literature is that most

language communities that have been investigated thus far are communities that already have a long tradition of literacy.

Research dealing with Third World countries, and especially sub-Saharan African countries, is rather scarce. Tabouret-Keller 1968, Sedlak 1974, Heine 1977, and Brenzinger 1992a, 1992b are the most significant studies that we are aware of. Given that language is human-specific, we can assume that language contact, and its subsequent outcomes (language maintenance, transitional or stable multilingualism, or language shift) are present all over the world and at all stages of human history. At all times and in all parts of the world, people from different linguistic backgrounds have, at some point, come into contact, and interacted with one another, through peaceful migration and trade, or by war, conquest, and annexation. If people are different in language, culture, and customs, we can then expect language behavior, attitudes towards language, and the very factors of maintenance or shift to differ from one area to the other, and from one language community to the other. Broadening the empirical basis of our investigations is therefore a necessity if we are to gain a deeper insight into the phenomena and to build an integrated theory of language maintenance and language shift that really has both a DESCRIPTIVE ADEQUACY and an EXPLANATORY CAPACITY.

Although it focuses on the Koromba, a language community that is undergoing language shift, this article also explores the situation of language maintenance and shift in Burkina. The objectives are to show that language maintenance and shift are at work in any given multilingual setting, to assess the extent to which the Koromba have undergone language shift, and to identify the specific factors of maintenance or shift in a community of oral tradition. Is the language shift of the Koromba reversible or should we expect their language to disappear in the near future?

The paper first provides a sociolinguistic profile of Burkina Faso so as to give a general picture of the language configuration and the setting of Koronfe in the country. Before introducing the specific case of the Koromba, an attempt is made to assess the overall situation of language maintenance and language shift in the multilingual and multi-ethnic context of Burkina Faso.

1. Sociolinguistic profile of Burkina Faso

Located on the west coast of Africa, Burkina Faso covers 105, 000 square miles (about the size of the state of Illinois) with a population of 10 million people in 1996. Burkina Faso is bounded by the Republic of Mali in the west and north, the Republic of Niger in the east, Togo, Benin, Ghana, and Ivory Coast in the south. Burkina Faso acceded to political independence in 1960, after nearly a century of French colonial rule. French, the official language, is spoken by less than 10% of the population. The largest majority of the population (88.68%) lives in rural areas and the economy of the country is still largely based on traditional farming.

Fig. 1: Burkina Faso in southern West Africa

1.1 The number of languages

The national language survey that was conducted between 1979 and 1981 has led to the identification of 59 'ethnic languages'[1] spoken in Burkina Faso. The term 'ethnic language' here accounts for the coincidence between 'language' and 'ethnic group' or 'nationality'. In other words, the 59 languages are primarily spoken by 59 different ethnic groups, regardless of their demographic weight or genetic relationship. Each ethnic group or nationality in Burkina Faso distinguishes itself from the others on the basis of its language and culture, its territory, and its socio-political organization. Table 1 captures this reality.

Table 1: People, language/culture, and territory

People*	Territory	Language/Culture
Gulmance/Gulmanceba	Gulmu	Gulmancema
Jootõe/Joore	Joojãnleen	Joowe(le)
Kasm/Kasna	Kasongo	Kas(m
Moaaga/Moose	Moogo	Moore
Pullo/Fulbe	Pulaari	Fulfulde
Sameni/Samaa	Samoko	Samoe
Samo/Samoya	Samot	Samoma
San/Sanan	Sampy	San

*The names of the people are given in the singular/plural forms.

The 'territory' factor, as well as the type of social organization, as it will be shown, have an important bearing on language maintenance and language shift in Burkina Faso.

1.2 The demographic weight of the languages

The number of native speakers varies considerably from one language to the other. For instance, languages such as Sillanka, Jelkunan, Byal, and others are spoken by no more than a thousand people in just one or two tiny villages. On the other hand, a language such as Moore has more than 4 million native speakers. Following the number of their native speakers, it is possible to range the languages of Burkina Faso into 3 categories as in Table 2:

Table 2: The categories of languages

Categories	Number of speakers	Number of Languages	Percentage
A	1,000,000 or more	1	1.69%
B	100,000 to 800,000	12	20.33%
C	Less than 100,000	46	77.96%

Of the 59 languages spoken in Burkina Faso, 46 languages have less than 100,000 speakers, 12 have more than 100,000 but less than 900,000 speakers, and only one language has more than one million speakers. In terms of their demographic weight, most of the languages of Burkina Faso (77.96%) are smaller than Ferguson's 1966 'minor language'.[2]

The 1985 general census of the population included the following question: 'Quelle langue parlez-vous couramment dans votre ménage?', that is, 'What language do you speak at home?' From the answers to this question, the demographic weight of the languages was established as in Table 3. The population was then estimated at 7,909,425 people.

Although census data ought to be taken with caution, the figures in the Table above offer an image that is close to reality. These figures are important not for their mathematical precision, but for the scale of greatness that they establish between the languages. Interestingly, it shows that French, Jula, and other foreign languages (in bold) are predominantly spoken in urban areas, whereas national languages are mostly spoken in rural areas.

1.3 Geographic distribution of the languages

Based on the spatial configuration of the languages, two main regions can be distinguished in Burkina Faso: the eastern region which covers 29 provinces, and the western region with 16 provinces. From now on, I will refer to them as the East and the West. 41 languages are located in the 16 provinces of the West and only 18 in the 29 provinces of the East. The West, therefore, has a more complex language configuration than the East. In the West, there is an average of 3 languages per province, whereas in the East, the same language may cover several provinces. The language configuration also has an important implication for language contact, for multilingualism, and for language maintenance and shift in Burkina Faso.

Table 3: Demographic sizes of the languages

	Number of speakers	%	rural	%	urban	%
National Languages	7,909,425	99.73%	7,014, 829	88.68	894, 596	11.31
1. Moore	3,997,741	50.54	3,446, 287	86.20	551, 454	13.79
2. Fulfulde	769,490	9.72	739, 770	96.13	29,720	3.86
3.Gulmma	445,635	5.63	440,092	98.75	15,543	3.48
4. Bisa	283,892	3.58	262,708	92.53	21,184	7.46
5. Dagara	245,452	3.10	236,612	96.39	8,840	3.60
6. Jula	209,197	2.64	99,499	**47.56**	109, 698	**52.43**
7. Lyele	192,123	2.42	178,849	93.O9	12,274	6.38
8. San	186,337	2.35	161,318	86.57	25,019	13.42
9. Bobo	178,469	2.25	142,882	80.05	35, 587	19.94
10.Bwamu	170,320	2.15	164,260	96.44	6,060	3.55
11. Lobiri	150,143	1.89	144,715	96.38	12,274	8.17
12. Marka	134,654	1.70	122,519	90.98	12,135	9.01
13. Senufo	113,347	1.43	110,037	97.07	3,310	2.92
14. Other NL[3]	449,322	5.68	425,283	94.64	24,039	5.35
15. Nuni	94,039	1.18	91,583	97.38	2,476	2.63
16. Tamasheq	73,528	0.92	72,265	98.28	1,263	1.71
17. Kassena	71,457	0.90	58,032	81.21	13,425	18.78
18. Cerma	45,442	0.57	34,550	76.03	10,892	23.96
19. FAL	28,247	0.35	14,498	**51.32**	13,749	**48.67**
20. Dogon	26,315	0.33	24,934	94.75	1,381	5.24
21. French	23,970	0.30	5,115	**21.33**	18,855	**78.66**
22. Siamou	14,553	0.18	13,007	89.37	1,546	10.62
23. Wunye	13,855	0.17	12,804	92.41	1,051	7.58
24. Kusa'al	11,108	0.14	11,045	99.43	63	0.56
25. Sisala	7,664	0.09	7,619	99.41	45	0.58
26. Other FL	3,063	0.03	1,334	**45.55**	1,729	**56.44**
27. Minianka	1,628	0.02	1,416	86.97	212	13.02

NL = national language FAL= foreign African language
FL = Foreign language.

It is also interesting to know that the 18 languages in the East are spoken by 69.19% of the population, whereas the 41 languages in the West are spoken by only 30.80% of the same population. Moore alone is spoken by half of the population of Burkina Faso, and the 58 remaining languages by the other half of the population.

Based on the Table 3, I have determined that 90.11% of the population of Burkina Faso actually speak only 14 languages, whereas the other 45 languages are spoken by only 9.89% of the population.

The imbalanced distribution of the languages in the West and in the East is not random. This situation, I believe, has its origin in the history of settlement and in the nature of the socio-political organizations that developed in each region.

1.4 Classification of the languages

Most of the languages spoken in Burkina Faso belong to three major families: the Gur or Voltaic languages (about 60%), the Manden languages (about 20%), and the West-Atlantic languages represented by Fulfulde.

In addition to these, we have the Nilo-Saharan languages that are represented by Zarma, Kaadkiini, and Songokiini, the Chamito-Semitic languages with two sub-families: the Chadic languages (Hausa), and the Berber languages represented by Keltamaasaq. Finally, there are isolated languages such as Seme, a Kru language,[4] and Dogon.

1.5 Status and functions of the languages

The Constitution of Burkina Faso (1991) recognizes French as the official language. All the 59 local languages are 'national languages'. This recognition, however, does not give them any specific function beyond the fact that they are used primarily for in-group communication. The 'Commission Nationale des Langues Voltaïques' (a National Bureau of Languages) and its 'Secrétariat Permanent' (Permanent Secretariat) were created in 1969. The objectives of the Commission are: to promote national languages, to suggest, encourage, and coordinate the study of national languages, and to elaborate and regulate proper usage of spelling systems.

The creation of the National Bureau of Languages made it possible for each language group to have its own 'Sous-Commission Nationale' (National Subcommission) if they so desire. There are twenty 'Sous-Commissions Nationales' today, and all the languages involved are used on national radio and for literacy campaign for adults. Fewer languages are used on national television. In 1997, there were about 60 newspapers and periodicals in 14 national languages.

1.6 Multilingualism

The situation of multilingualism varies from one region to another because it depends on the language configuration of the region. The West displays a greater rate of multilingualism than the East.

The density of the language configuration in the West brings people from various linguistic and ethnic backgrounds to resort to Jula as a lingua franca. In the East, it can be observed that multilingualism is related either to a person's mobility or to the power relationship between the language groups in contact. In the East, the bilingual person is either a person who has traveled (outside his habitual language environment), or a person who belongs to a minor language group. It is the language of the major group that usually serves as mainstream language. Knowledge of the mainstream language is vital for linguistic minorities, unless they choose to stay in their territory. Members of the dominant languages will

learn the language of the minor group only when they move into the territory of that minor group where they find themselves in a minority position.

The outstanding pattern of multilingualism in Burkina Faso can be formulated as follows: **L1 + {Lm, Jula}**. This means that the bilingual person speaks the mainstream/major language (**Lm**) or a lingua franca (**Jula**) in addition to his first or ethnic language (**L1**). Actually, the pattern is **L1 + Lm** in the East and **L1 + Jula** in the West. L1 in the East is any minor language and Lm a major language such as Moore, Gulmancema, Fulfulde, and so on. In the West, L1 is any of the 40 languages and Jula is the link-language for all. In both regions, L1 generally occupies the family or in-group domain, whereas Lm or Jula is used for mainstream (out-group) interactions.

It can be said that multilingualism is on the increase in Burkina Faso because of the linguistic diversity and, most importantly, because of the increasing mobility of the population. Linguistic minorities, in particular, have developed a stable multilingualism as a normal way of life.

1.7 Literacy

It is fairly wellknown that literacy plays an important role in language maintenance. Communities that have a long tradition of literacy also have a greater resistance to linguistic assimilation than those having only an oral tradition.

The rates of schooling in Burkina Faso are still very low. According to the National Institute for Statistics and Demography (1993:23), the illiteracy rate in Burkina Faso was 92.20% in 1991. Even though government agencies and non-governmental organizations have been conducting literacy campaigns for decades, all the languages of Burkina Faso are still unwritten oral languages.

1.8 Conclusion

Burkina Faso is a country where 'people differing in language are in contact with each other' (Fishman 1964). It offers an interesting setting for the investigation of language maintenance and language shift. The linguistic and the socio-economic environment in this country is significantly different from that of the western industrialized world, where most investigations on language maintenance and shift have been conducted thus far. From both theoretical and methodological considerations, studies of language maintenance and shift in the setting of Burkina Faso not only broaden the empirical basis of the field but also can give us a new insight into language contact phenomena.

2. Language maintenance and language shift in Burkina Faso

In keeping with the language configuration, the contact situations in Burkina Faso also vary from one region to the other, from the East to the West. As mentioned earlier, this divergence is not random but finds its justification in the history of land occupation by the various ethnic groups and in the socio-political organization that prevails in each region. Based on my knowledge of the language situation of Burkina Faso and on the scarce existing literature, I will explore, in this section, the general situation of language maintenance and language

shift as the result of the contact between people differing in language and customs. Today's developing societal multilingualism is the result of that language contact, which has been conducive to language maintenance, partial language shift, or language death. Since the contact situation varies from one region to the other, I will, for the sake of clarity, consider the East and the West separately.

2.1 Language shift in the East

I pointed out in section 1.2 above that 69.19% of the population of Burkina Faso live in the East and speak 18 languages. It is also in the eastern provinces that centralized institutional and political systems emerged in pre-colonial days. These are the Moose Empire, the Kingdom of the Gulmanceba, and the Emirate of the Fulbe. For this reason, I assume that language maintenance and shift occurred chiefly in the East and in a more spectacular way than in the West. The West is inhabited by a mosaic of small ethnic groups living in what European anthropologists (e.g., Hébert 1976, and Savonnet-Guyot 1986) have called 'fragmentary', 'acephalous', 'anarchical' or 'stateless' societies.

In the middle of the 15th century, according to historians, a horse-riding people from Gambaga in northern Ghana came to invade the territory that is now called the Moogo, that is, the country of the Moose. This group was the Dagomba. After the invasion and settlement by the Dagomba, the building of centralized institutional and political systems (the Moose Empire, the Kingdom of the Gulmanceba, and the Emirate of the Fulbe) induced language maintenance and language shift among the indigenous populations. I will first consider some of the cases of language shift that have been triggered by the contact with the Moose, the Fulbe, and the Touaregs.

2.1.1 The assimilation of indigenous populations by the Moose

Historians generally agree that the ethnic group of the Moose has emerged from the fusion of the Dagomba invaders with several indigenous ethnic groups, namely the Ninisi (plural of Niniga),[5] the Yõnyõose (plural of Yõnyõaaga), the Silmi-Moose (plural of Silmi-moaaga), and the Yarse (plural of Yarga), among others.

A. THE NINSI AND THE YÕNYÕOSE

The prevailing view in the literature considers the Ninsi and the Yõnyõose as the first occupants of the land before the invasion of the Dagomba. They were distinct populations having their own languages, their own territory, and their own socio-political organization. According to Halpougdou (1992:209-11):

> Les Ninsi, comme les Yõnyõose, avaient leur moyen propre d'expression avant l'arrivée des Dagomba, selon tous les informateurs que nous avons pu rencontrer. Mais personne n'a pu fournir d'éléments linguistiques précis à ce sujet. Pour Lazare Ilboudo 'les Ninsi étaient des forgerons et avaient une langue qui leur était propre.' Mais lui-même ne sait pas une seule parole de cette langue. De même, Joseph Rouamba est persuadé que 'les Yõnyõose avaient leur

langue à eux. C'est le Moore de ceux qui sont venus de Gambaga qu'ils ont adopté aujourd'hui.

[According to my consultants (Lazarus Ilboudo and Joseph Rouamba), The Ninsi as well as the Yõnyõose used to have a language of their own before the arrival of the Dagomba. None of them, however, was able to bring precise linguistic evidence to support their claim. For Lazarus Ilboudo, 'the Ninsi were blacksmiths and were speaking a language of their own', but he does not know a single word of that language. Similarly, Joseph Rouamba is convinced that 'the Yõnyõose used to have their own language. Later on, they have adopted the variety of Moore spoken by those who came from Gambaga] (my translation).

The Ninisi and the Yõnyõose are now completely assimilated to the Moose, and no-one knows what their languages looked like. The terms nininga/nininsi and yõnyõaaga/yõnyõose could be remnants of their languages. Morphologically, these terms can be analyzed as follows:

	Singular	**Plural**
1	/nin + ga/ [nínà]	/nin + si/ [nínsì]
2	/nini + ga/ [níníà]	/nini + si/ [nínísì]
3	/ninin + ga/ [nínígà]	/ninin + si/ [níníns̀ì]
4	/yõnyõ + ga/ [yõywã: á]	/yõnyõ +se/ [yõyõ:sé]

In the singular and plural forms, we have the roots: **nin-**, **nini-**, **ninin-**, and **yõnyõ-** that are meaningless and rather unusual in Moore. **-ga** and **-se/-si** are the singular and plural class suffixes.

Similarly, *Sàpòné* is a place name that is said to have a Nininga origin. In terms of its morphological structure, *sàpòné* is a 'possible' word in Moore only if it is analyzed as *sà+pòné*. In this case, we have the root *sà-* that means 'rain', but the second part, *-pòné*, would be meaningless in Moore. There is no other possible way to analyze *sàpòné*, or the other terms above (*ninga/ninsi*, *niniga/ninisi*, *nininga/nininsi*, and *yõnyõaaga/yõnyõose*).

B. THE YARSE

The Yarse (pl. of Yarga) are found all over the Moogo. It is now well established that they have a Manden origin. The Yarse are generally adepts of Islam and their main occupation today is trade and farming. Even though they remain conscious of their origin, the Yarse are now linguistically assimilated to the Moose. One linguistic peculiarity of the Yarse (as well as the Yaadse in the Yatenga) is that they do not make the distinction between informal/formal use of the personal pronouns *fóo/yãmba*. They invariably use the informal *fóo* in all of their interactions, regardless of the social rank of their interlocutor. In the Yatenga province, I have identified a few place names which constitute evidence that the Yarse used to speak a Manden language that is related to Bamanankan spoken in Mali.

C. THE ASSIMILATION OF THE MARANSE

The Maranse people call themselves Kaado (Singular) and Kaadeno (Plural). They are now scattered in the provinces of Lorum, Yatenga, and Sanmatenga, where they are renowned fabric dyers. The Maranse offer us another case of linguistic assimilation by the Moose. The Maranse have largely adopted Moore as their first language. Their language, which they call Kaadkiini, is still spoken, but mostly by elderly people. It is a language that belongs to the Nilo-Saharan family.

D. THE EMERGENCE OF A NEW ETHNIC GROUP: THE SILMI-MOOSE

Intermarriage and economic alliances between the Fulbe and the Moose have not only been conducive of language shift among some of the Fulbe, but have led to the emergence of a new ethnic group: the Silmi-Moose (pl. of Silmi-Mooaga). The term literally means 'Fulbe turned into Moose'. Linguistically, the Silmi-Moose are assimilated to the Moose but socially and culturally, they are more closely related to the Fulbe.

E. TWO ENDANGERED LANGUAGES: DOGON AND KORONFE

Marcel Griaule is undoubtedly the most famous of the anthropologists who devoted years of research on the Dogon, an ancient population found in the region of Bandiagara, Mali. The Dogon are also found in Burkina Faso, where they are called Kibsi (pl. of Kibga) by the Moose, and Haabe by the Fulbe. The Dogon, according to the information given to us by the Moose, the Sillanko, and the Koromba, were the first inhabitants of the Yatenga, the Lorum, the Baam, and the Sanmatenga provinces. Today, most of the Dogon population have been linguistically assimilated to either the Moose or to the Koromba. Their language is still spoken by the elders in a few villages around Tou, in the north of the administrative Department of Thiou in the province of Yatenga.

The great majority of the Koromba (pl. of Koromdo) in the Yatenga, the Lorum, and the Zõndoma provinces have abandoned their language in favor of Moore. I examine their case in some more detail in the second section.

2.1.2 The assimilation of indigenous populations by the Fulbe

We also know from history that the Liptaako and the Yaaga regions were inhabited by the Gulmanceba (pl. of Gulmance) prior to the arrival of the Fulbe from Macina, Mali in the 17th century. After a period of peaceful coexistence, the Fulbe, led by Ibrahim Seydou and supported by the King of Sokoto[6] and the Moose King of Boulsa (in the Province of Namentenga), came to wage a war against the Gulmanceba, who were repelled towards the East and the South-East. Ibrahim Seydou then established an Emirate in 1810 (Guissou 1998). The foundation of the Fulbe Emirate of the Liptaako resulted in the assimilation of some of the indigenous populations, such as the Gulmanceba.

During my field research, I have identified many place names which have a Gulmance origin. For instance, Dori, the capital city of the province of Seeno, has a Gulmance origin. The Gulmance population who remained in the Seeno and the Yaaga provinces has been linguistically assimilated by the Fulbe. The linguistic assimilation included other indigenous people who were captured and enslaved.

The terms Macube (plural of Macudo) or Rimaybe (plural of Rimayjo) refer to these assimilated indigenous populations. The Macube or Rimaybe speak Fulfulde as their first language, but they do not have the same social status as the Fulbe.

2.1.3 The assimilation of indigenous populations by the Keltamaashaq

The Touaregs, also called Tamashek, Tamaashaq or Keltamaashaq are found in the north of the province of Udalan. The Touaregs have a Berber origin, and their language belongs to the Berber branch of the Hamito-Semitic family.

Like the Fulbe, the Touaregs have captured and enslaved indigenous people who now form the group of the Bellabe (pl. of Bellajo).[7] The Bellabe, who are the equivalent of the Rimaybe in the Fulbe community, have no idea of their original language(s). They have adopted the language of their former masters with whom they continue to live. The Bellabe do not have the same social status as the Keltamaasaq.

Except for the Ninisi, the Yõnyõose, and the Yarse, all the other cases that I have reported here are cases of partial language shift. Almost every language group in the East has experienced partial language shift. This includes the Moose, who constitute the dominant group in Burkina Faso. In a recent study, Gomgnimbou 1998 reported that some of the Kasna population in the areas of Tiébélé and Po have a Moaaga origin. They are the descendants of former Moose migrants from Ouagadougou and Loumbila. They are now linguistically assimilated to the Kasna. Partial language shift may cause the shrinking of a language, but in no way its death. The Gulmanceba in the Seeno and the Yaaga, for instance, have shifted to Fulfulde, but Gulmancema is still well alive and is spoken by nearly 700,000 people in the provinces of Gulmu, Komanjaari, Tapoa, and Yãnyã.

2.2 Language maintenance in the East

Language maintenance has been down-played in the literature, and understandably so if we consider that shift is more spectacular than maintenance. Language maintenance, for most people, is taken for granted. It becomes interesting only when a language survives in a contact situation where it is normally expected to disappear.

The coexistence of 'major' languages with tiny minor languages, (for example Sillanka, Songokiini, Byari, Moba, Kusa'al) in the East implies that some of the indigenous populations have successfully resisted linguistic assimilation by the dominant groups. As I pointed out in 1.5, above, linguistic minorities in the eastern provinces are typically bilingual, as opposed to members of the largest linguistic communities. The stable bilingualism the minority groups have developed can be seen as a strategy of survival. Bilingualism does not seem to impair their attachment to their ethnic language, which they systematically use in the family domain as well as in in-group interactions. The learning of the dominant languages[8] is simply motivated by the need for mainstream interactions and for mobility in the wider society. The Sillanko, who probably constitute the smallest ethnic group in Burkina Faso, provide us with the most striking case of language

maintenance in the East. In 1989, their language was spoken by only 780 people,[9] and most of them (88.1%) were trilingual.[10]

Two main factors can explain the language maintenance of linguistic minorities. The first factor is internal and has to do with their strong attachment to their ethnic language. Linguistic minorities feel that language is the first and most important element that gives a certain substance to their identity as a people. To lose one's language, in their view, is equivalent to losing one's substance and to becoming worthless. Many Sillanko I interviewed made the following observation: 'A person who is right does not abandon the language that he has suckled!' This observation implies that language loyalty is a moral duty. The territory factor is the second most important factor of language maintenance for linguistic minorities. Regardless of its demographic weight, each language group in Burkina Faso has its territory that is recognized and respected by the others. The territory of the Sillanko, for instance, is restricted to their village (Bãgkeemde) and to their farming lands. The neighboring Moose, who constitute the dominant group in this region scrupulously respect the territory of the Sillanko. It is taboo for the chief of the Moose to pass through the territory of the Sillanko, as this could be regarded as a voluntary intrusion.

2.3 Language maintenance and language shift in the West

Although it has a more complex language configuration, the West presents an interestingly different situation. There are fewer cases of language shift, and these cases follow a different pattern than those in the East.

2.3.1 Language maintenance

The 41 languages in the West are spoken by only 30.81% of the population of Burkina Faso. The number of speakers of these languages varies from about 1,000 (for example Jelkunan, Wara, Natioro) to 300,000 people (for example Dagara, Jula, San, Bobo). The average number of speakers for each language represents only 0.75% of the population of the country. In spite of the density of the language configuration, the West shows fewer cases of language shift, and there are three main explanations for this situation.

First, there is the absence of a clearly dominating language. Second, and most important, there is no centralized socio-political system comparable to the one found in the East. Hagberg (1998:31) observes that 'a common characteristic of the autochthonous groups is that socio-political authority has traditionally not transcended the village. These groups demonstrate strong decentralized tendencies and appear to have remained relatively independent, even in times of outside influence of more or less hegemonic states.' This observation is confirmed by Kone (1988:1), the President of the Sous-Commission Nationale du Cerma, who also remarks that 'l'organisation sociale de ces populations comportait des traits structurels communs ou du moins fréquents tels que absence de gouvernement central et autonomie villageoise ... [the social organization of these populations included common structural features such as the absence of central government and autonomy of the villages...]'. Finally there is Jula, the lingua franca in the West, that serves as a link language between the various ethnic groups.

In precolonial days, the West was shared by the Jula Kingdom of Kong (Ivory Coast) and by the Kingdom of the Kenedugu (Mali). These are the 'outside influence of more or less hegemonic states' that Hagberg referred to. Given its peripheral position, however, the central authority of Kong (and Sikasso as well) was unable to exert a direct and permanent control over the West. As a consequence, the mosaic of people who inhabit the region were able to keep a relative autonomy. Whereas the indigenous populations in the East were directly and constantly in contact with the power system (the emperor and his representatives at various levels: the kingdom, the canton, the village, or the district), those in the West were less dependent and could organize their social life as they wished within their territories. A general context such as this is more favorable to language maintenance than to language shift. The few cases of language shift that we encounter in the West have a quite different pattern from those in the East.

2.3.2 Language shift in the West

To my knowledge, only the Cefo (Tyéfo) and the Komono (Cesa) in the province of Comoe and the Fulbe in the province of the Kossi are communities experiencing language shift. A fourth case of language shift in the West could be related to the urban phenomenon of Bobo-Dioulasso, the largest city in the West.

A. THE CEFO

The term Cefo designates both the people and their language, which is a Gur language. During the field research I conducted among the Cefo, it was noticeable that language shift was in progress in this community. The ethnic language was still spoken in a few villages (Dramandougou and Degue-Degue, for instance), but mostly by adults and elderly people. The community as a whole is shifting to Jula, the lingua franca of the region.

Language shift among the Cefo started with their violent contact with the troops of Samory Toure in 1897 (Kambou-Ferrand 1993:230): 'La marée samorienne provoqua en quelques semaines dans ces régions, et pour longtemps, un chaos indescriptible, inscrivant dans le paysage une sorte d'image biblique de fin du monde [It only took a couple of weeks for the troops of Samory to create an indescribable chaos, and to instill a biblical vision of the end of the world]'. According to Kambou-Ferrand 1993, most of the Cefo adults who engaged in the battle against the troops of Samory were exterminated.

B. THE KOMONO OR CESA

The Cesa constitute a linguistic minority found in the south-east of the province of Comoé. The weak demographic weight of the Komono today is the result of their long contact with the Jula of Kong whose cultural, economical, and political supremacy is unquestionable. Kambou-Ferrand (1993:323) speaks of a 'cultural genocide' of the Komono due to their contact with the Jula of Kong:

> Les observateurs sont toujours surpris par la faiblesse numérique des groupes ethniques qui occupent la zone comprise entre les fleuves Comoé et Bougouriba. Contrairement aux Tyéfo, cependant, la fai-

blesse démographique des Komono ne serait pas imputable à l'invasion samorienne; il n'y eut pas ici de grandes batailles et de massacres. La disparition progressive de ce peuple semble plutôt procéder d'un génocide culturel, provoqué par son contact prolongé avec les Dioula de Kong. L'acculturation profonde qui en résulta s'accompagna de la 'disparition' de l'ethnie.

[Observers are always surprised by the low number of people of the ethnic groups that are located between the Comoe and the Bougouriba Rivers. Contrary to the Tyefo, however, the weak demographic weight of the Komono is not the consequence of the invasion of the troops of Samory. No big battles or massacre took place here. The progressive disappearance of this people rather seems to stem from a cultural genocide due to the long period of contact they had with the Dioula of Kong. The profound acculturation that followed this contact went along with the disappearance of the ethnic group] (my translation).

C. THE FULBE

An important community of Fulbe moved from Macina and came to settle in the province of the Kossi, and created the independent principalities of Barani and Dokuy in the 18th and 19th centuries, respectively (Kambou-Ferrand 1993: 173). In spite of their military, political, and economic predominance over the Bwaba, the major ethnic group in the Kossi, the Fulbe have adopted Bwamu, the language of the Bwaba. Moreover, those Fulbe who left Macina in order to escape forced conversion to Islam and who now live in the area of Dokuy have not only shifted to Bwamu, but have also adopted the culture of the Bwaba. They are known as the 'Boofwa', that is, 'Fulbe turned into Bwaba', like the Silmi-Moose 'Fulbe turned into Moose'.

D. THE MELTING POT OF BOBO-DIOULASSO

Bobo-Dioulasso (originally called Sya), the largest town in the West, has been and still is an important center of trade. For this reason, it has attracted people of various ethnic groups from the different parts of Burkina Faso. Economic activities and social mobility require the mastering of Jula, the lingua franca, by these migrants. In the long run, the lingua franca starts to invade and then to take over the family domain, so that the ethnic languages are no longer transmitted to the children: there is an inter-generation language shift among the migrants. Language shift is even faster when the parents do not have the same first language. A child born to parents who speak different ethnic languages has little chance of learning his/her parents' languages because Jula, in such a case, already serves as a link language for the parents. As time goes on, Jula is acquiring native speakers, whereas the ethnic languages are falling into obsolescence.

Following Prost 1968, Sommer 1993 reports Natioro, Wara, and Jelkunan (Blé) as moribund languages. These languages were still very much alive in 1988 when I conducted field research on them. There was nothing that showed that these languages were endangered. Like the other linguistic minorities that I know

of, the Natioro, the Wara, and the Jelkunan are all bilingual. Generally, they use their ethnic languages in the family domain and within the group, and resort to Jula for mainstream interactions.

The presence of the lingua franca, the territory factor, and the socio-political organization of the different groups have influenced language maintenance in the West of Burkina Faso. The relative complexity of the language situation in the West can be seen as the result of language maintenance.

The number factor, although it is important, does not seem to be decisive in language maintenance and shift. In the Sanmatenga province, as mentioned earlier, the 780 Sillanko have successfully resisted to linguistic assimilation, whereas the Koromba have shifted to Moore in spite of their demographic weight, a hundred times superior to that of the Sillanko. It is the case of the Koromba that we are now going to look at in some more detail.

3. The case of the Koromba

The Koromba are undergoing language shift. This section analyzes the ongoing sociolinguistic situation of that community so as to assess the extent to which this group has actually shifted to the dominant language (Moore), and to identify the specific factors that are responsible of the language shift.

3.1 The people

The Koromba are called Flse (pl. of Flga) or Yõnyõose by the Moose, and Haabe by the Fulbe. They call themselves Koromba (pl. of Koromdo). Their language is Koronfe and their territory is the Lorum. The Koromba people live in the provinces of Yatenga, Zondoma, Lorum, and Soum, which are all located in the north of Burkina Faso.

The Koromba are considered to be the first occupants of the land. According to their tradition, the Koromba descended to earth in a metallic box, for one version, or by a thread, for the other version. There is a third version in which some of Koromba claim that Egypt is the point of departure of their long migration, which ended in the Lorum.[11]

The Koromba are farmers and cattle-breeders. Their traditional religion is animism but more and more Koromba are becoming converts to Islam or Christianity.

3.2 The language of the Koromba

According to Manessy 1969, Koronfe is a Gur language related to the Gurunsi languages. The same author in 1979 distinguishes Kurumfe and Gurunsi, and both are classified as 'langues voltaïques'. More investigation is probably still needed for a proper classification of Koronfe.

3.3 The questionnaire survey for data collection

The data that are analyzed here were collected through a questionnaire survey conducted in 17 Koromba villages located in the provinces of Lorum, Yatenga, and Zondoma. In each of the villages that were selected on the basis of their geo-

graphic position, 1/10th of the population aged 12 and over, or a total of 537 individuals, were interviewed.

The questionnaire was structured in three main parts. In the first part we wanted to know the characteristics of the subject, such as sex, age, religion, marital status, schooling, main occupation, and mobility. In the second part, we wanted to know whether the subjects' first language was transmitted to the younger generation or whether there was already an inter-generation language shift. It was therefore important to know the first language spoken by the parents of the respondent and then to compare it with the first language of the respondent himself or herself. In the second part, we also considered the language repertoire of the respondents. The third part of the questionnaire was devoted to actual language use of the respondents in different domains, namely the home, the marketplace, and ritual ceremonies. These three domains were the only relevant domains to be taken into consideration.

As we were conducting the questionnaire survey, which lasted 4 weeks, we had the opportunity to observe the interactions of the Koromba in different situations: in their homes, in the marketplace, within the group, and with people from different ethnic groups, such as the Moose and the Fulbe. These observations were to confirm or to falsify the results of the questionnaire survey.

3.4 Data analysis and results of the study

This section analyzes the data that have been collected. It first presents the characteristics of the subjects and their language repertoire. Language maintenance and shift among the Koromba is determined through the comparison of the first language of the respondents with that of their parents. This comparison shows whether or not Koronfe is regularity transmitted to the younger generation. The domains of language use reveal areas where language shift is advanced, and areas of resistance to linguistic assimilation. Finally, the factors of maintenance and shift will be examined.

3.4.1 Characteristic of the subjects

Of the 537 subjects, 281 were males and 256 females. As Table 4 shows, three age groups were distinguished: the young, the middle-aged, and the elderly.

Table 4: The age groups

Age groups	Males	Females	
12 - 20	126	87	**213**
21 - 40	88	123	**211**
41 and over	67	46	**113**
Total	**281**	**256**	**537**

All the Koromba that we interviewed were farmers. Only 5 children had attended primary school. Most Koromba practice animism, the traditional religion. Only a few of them are Christians or Muslims.

3.4.2 Language repertoire of the Koromba community

Table 5 presents all the languages spoken by the 537 Koromba we interviewed. It actually represents the language repertoire of the Koromba community as a whole.

Table 5: Language repertoire of the Koromba:

Language	L1	%	L2	%	L3	%	L4	%
Moore	384	71.37%	139	25.83%	-	-	-	-
Koronfe	153	28.43%	64	11.89%	-	-	-	-
Fulfulde	-	-	23	4.28%	67	12.47%	-	-
Jula	-	-	18	3.35%	6	1.11%	9	1.69%
French	-	-	4	0.74%	2	0.37%	-	-
Agni	-	-	1	0.18%	-	-	-	-
Arabic	-	-	1	0.18%	-	-	-	-
Baule	-	-	-	-	1	0.18%	-	-
Sillanka	-	-	-	-	1	0.18%	-	-

The Table shows that 71.37% of the 537 subjects who responded to the questionnaire speak Moore as their first language (L1), whereas only 28.43% speak Koronfe as their first language. Moore is also the most important second language (L2), since it is spoken by 25.83% of the subjects, whereas Koronfe comes in second position with only 64 speakers. It can be assumed that Moore has a greater influence on the Koromba than Fulfulde, which is spoken by only 23 persons as a second language.

The mobility of the subjects shows through what can be seen as 'foreign languages', that is, Jula, Agni, Baule. Indeed, the speakers of these languages had traveled and lived in the Ivory Coast for a few years. The mobility, however, is weak and concerns only the male population: only 22 male adults (7.82%) had traveled and lived abroad. Only 6 people claim to 'understand' some French: a sixty-five year old man who served in the French army during the Second World War, and 5 other male adults who attended primary school. None of the children I interviewed was attending school.

3.4.3 The demographic weight of the languages

The demographic weight of the languages that make up the repertoire of the Koromba is assessed through the total number of speakers (regardless of the degree of proficiency) of a given language in that repertoire. Table 6 confirms the predominance of Moore, Koronfe, and Fulfulde, which are the main languages spoken in the three provinces. Moreover, it shows that Moore is spoken as first or second language by 523 (97.21%) of the 537 subjects, whereas Koronfe is spoken by only 217 (40.33%) people as a first or second language. This is already an indication of an advanced language shift among the Koromba.

Table 6: Language repertoire and demographic weight

Language	Number of speakers	Percentage	Spoken as
Moore	523	97.21%	L1 or L2

Koronfe	217	40.33%	L1 or L2
Fulfulde	91	16.91%	L2 or L3
Jula	33	6.13%	L2, L3 or L4
French	6	1.11%	L2 or L3
Agni	1	0.18%	L2
Arabic	1	0.18%	L2
Baule	1	0.18%	L3
Sillanka	1	0.18%	L3

3.4.4 The first language of the parents

Table 7 shows that most parents have different ethnic languages. Koronfe is spoken as L1 by 63.80% of the fathers, but only by 40.48% of the mothers. Inversely, Moore is spoken as L1 by 59.51% of the mothers, but by only 36.19% of the fathers.

Table 7: The first language of the parents

Language	Father	%	Mother	%
Moore	194	36.19 %	269	59.51%
Koronfe	342	63.80 %	183	40.48[12]

It can be assumed that the 194 fathers who speak Moore as L1 have already shifted to that language. The majority of mothers (269) speak Moore as first language because they are either Moose or have already shifted to Moore. Intermarriage between Koromba men and Moose women is common, and it is difficult to imagine a Koromdo young man taking a Moaaga young girl as a spouse unless he is already a fluent speaker of Moore. Intermarriage appears here as being the most evident factor of language shift among the Koromba.

3.4.5 The first language of the respondents

The comparison of the first language of the respondents and that of their parents indicates the degree of transmission of the ethnic language and simultaneously reveals the degree of language maintenance and language shift among the Koromba. The comparison shows that even though Koronfe is spoken by 525 parents (342 fathers and 183 mothers), most of their children (71.50%) now speak Moore as their first language (L1'). Only 28.49% of the children continue to use Koronfe as L1. Language shift among the Koromba is therefore at an advanced stage and is due to a severe impairment in the transmission of L1.

Table 8: Degree of language shift among the Koromba

L1	L1'
Koronfe	Moore
153 (**28.49%**) ---------	384 (**71.50%**)

3.4.6 The domains of language use among the Koromba

Moore, Koronfe, Fulfulde, and Jula are the main languages spoken by the Koromba interviewed. The question now is to find out how these languages are actually used: 'who speaks what, to whom, under which circumstances, and for what purpose?' To answer that question, I have considered three domains of language use by the Koromba: the home/family, the marketplace, and rituals ceremonies. These are the most relevant and the most important domains of language use for the Koromba. Table 9 offers a synoptic view of language use in these three domains.

Table 9: Domains of language use among the Koromba.

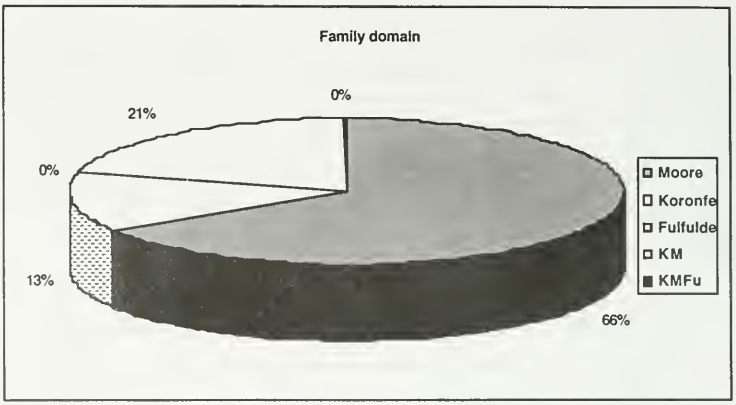
Language	Family	Marketplace	Ritual ceremonies
Moore	355	71	86
Koronfe	69	5	180
Fulfulde	1	-	-
KM	112	6	-
MFu	-	7	-
KMFu	1	138	-
NR	-	309	271

KM=Koronfe+Moore; MFu=Moore+Fulfulde;
KMFu=Koronfe+Moore+Fulfulde; NR=No response.

As Table 9 shows, Moore prevails in the family/home domain, whereas Koronfe is predominantly used for ritual celebrations (the religious domain). Moore has also started to invade the religious domain, where it is used by 86 subjects (32.33%). As one could expect, the 3 most important languages of the region (Moore, Koronfe, and Fulfulde) are all used in the marketplace. However, most subjects (309) did not respond to the question related to their language use in the marketplace because there was none in their village.

3.4.7 The family domain

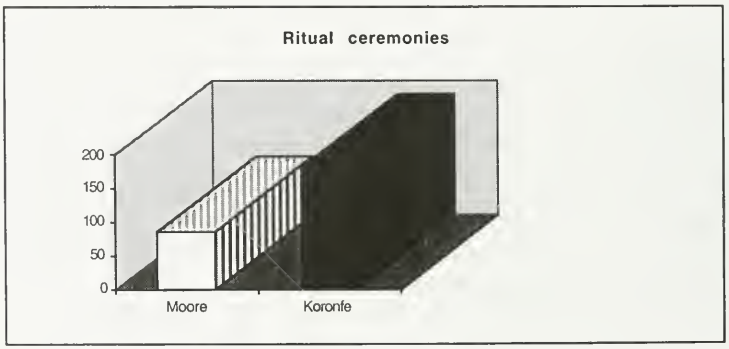
In the domain theory, the family/home domain plays an important role in language maintenance. It is the family domain which generally offers the greatest resistance to language shift. In the chart below, we can distinguish two situations of language use in the family/home setting: the use of just one language (either Moore or Koronfe), and the combination of the two languages (Moore and Koronfe). In the first situation, the use of Moore in the family domain is more important (66%) than the use of Koronfe (13%). In the second situation, it appears that 21% of the respondents use both Moore and Koronfe. Only 2 persons claim to speak Fulfulde or combine Koronfe, Moore, and Fulfulde altogether. In the chart of the family domain, these two persons show as 0%.



There is no doubt that language shift is at an advanced stage in the Koromba community where Moore is replacing Koronfe in the family/home domain, which is the domain of intimacy.

3.4.8 Ritual ceremonies

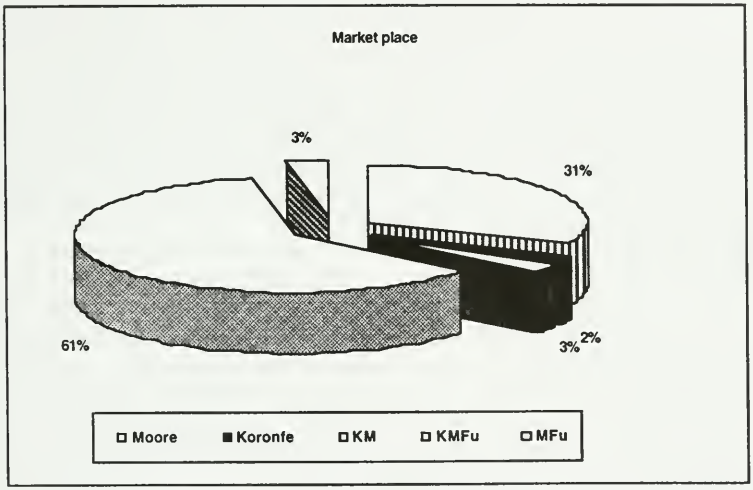
Besides the family/home domain, religion is another important factor of language maintenance. The ritual ceremonies of the Koromba are generally conducted by adult men rather than by women and youngsters. 266 male adults responded to the question related to the ritual celebrations. The chart below shows that Koronfe and Moore are the only two languages used for ritual ceremonies. Even though language shift seems to be at an advanced stage, Koronfe is the language used most in the religious domain. 180 Koromba (67.66%) conduct ritual ceremonies in Koronfe, whereas only 86 persons (32.33%) claim to use Moore in that domain. The predominance of Koronfe in the ritual ceremonies confirms the fact that religion is also an important factor of language maintenance. It is to be noticed, however, that Moore has started to invade that domain too.



3.4.9 The marketplace

The marketplace is an interesting setting for the observation of multilingualism because it is the place of interaction between people from different linguistic backgrounds. Moore, Fulfulde, and Koronfe, the main languages of the region, are also the main languages used in the marketplace.

Although most of the interviewees did not respond to the question related to their language use in the marketplace, the greatest tendency (61%) is to use Moore, Fulfulde, and Koronfe (KMFu) in the marketplace. The fact that 71 Koromba (31%) use only Moore simply means that this language is preponderant in the region.



3.4.10 Factors of language shift

The comparison of the first language of the parents and that of their children clearly shows that Koronfe is not being transmitted to the younger generation. In the family domain, Moore is replacing Koronfe. The use of Koromba is prevalent only in the ritual ceremonies, although Moore is also present. All these facts show that language shift among the Koromba is not only real, but is also at an advanced stage. The question that arises now is: what are the specific factors that have triggered that language shift?

3.4.10.1 Historical factors of language shift

As I pointed out in section 2.1., the invasion of the Dagomba and the subsequent establishment of centralized political systems (the Moose empire, the kingdom of the Gulmanceba, and the Fulbe emirate) have induced language shift and/or the assimilation of some of the indigenous populations. This seems to be the case of the Koromba that we are dealing with here. The Lorum, that is, the homeland of the Koromba, is now located within the Moose Empire. In most of the Koromba villages that I visited during field research, I was surprised to find that the chief of the village is a Moaaga, whereas the chief of the land is a Koromdo. The fact that

the chieftaincy of the land as a function is assumed by a Koromdo is an evident recognition that the Koromba were the first occupants of the land. The historical factors that induced language shift among the Koromba are primarily the military and political supremacy of the Moose. The demographic size of the Moose has increased with time and was not present at the start.

3.4.10.2 Internal factors of language shift among the Koromba

The internal factors of language shift among the Koromba are the most important. From what I observed and heard from the elders, the Koromba, and especially the youngsters, make a correlation between the 'monolingual speaker of Koronfe' and 'backwardness' or 'ignorance'. They seem to have a rather low image of their ethnic group and of their language and this probably explains their eagerness not only to learn Moore but also to adopt some of the cultural features of the Moose. Many Koromba, for instance, have adopted the facial scarification and the patronymics of the Moose. The rather low self-image they have corresponds to a certain desire to identify with the Moose. Intermarriage with the Moose is not only frequent but is also perceived as desirable. The Koromba are traditionally animists. To a certain extent, it seems that their adoption of Islam or Christianity is also a result of the influence of the Moose.

3.4.10.3 Factors of maintenance

The fact that language shift is at an advanced stage does not imply that the group has totally surrended. Resistance to assimilation is still felt in the community and is especially strong among the elders. Resistance to linguistic and cultural assimilation takes the forms of language taboos. One of these taboos concerns the Ayo, the supreme chief of the Koromba. Once the Ayo takes office, he no longer speaks a language other than Koronfe. When I visited the Ayo of Tulfe and that of Pobe Mengao, they pretended that they could not speak Moore and had to resort to a translator. The other language taboos relate to religion. In all the Koromba villages that I visited, it was forbidden to speak Moore in the sacred places that shelter the shrines or the tombs of the ancestors. The fact that Moore and Moore alone is forbidden indicates that the Koromba are conscious that Moore is the threat to the survival of their language.

Another important factor that will contribute to the maintenance of Koronfe stems from the creation of the 'Commission Nationale des Langues Voltaïques'. The Koromba elite are presently on the move to get the creation of a 'Sous-Commission Nationale du Koronfe', that is, a National Subcommission for Koronfe. That Subcommission is likely to contribute to the promotion of Koronfe through its study and its use for adult literacy efforts. Thus, the Koronfe Sub-commission can be a factor that not only enhances resistance to assimilation, but can also reverse the current trend toward language shift.

Similar language taboos are found in other linguistic minorities of the East, such as the Sillanko and the Samoya. They have sacred places and rituals where the use of Moore is formally prohibited.

4. Conclusion

Paulston (1994:9) observes that 'ethnic groups within a modern nation-state, given opportunity and incentive, typically shift to the language of the dominant group'. In this study, several cases of language shift have been reported that indeed support Paulston's observation. The language shift of the indigenous populations in the East, in particular, occurred either in already existing nation-states (the Moose empire, the kingdom of the Gulmanceba) or in the process of their creation (the Fulbe emirate of the Liptaako). Politics, the military, trade, and religion, are the main decisive elements in the processes of language shift reported here.

The examination of the particular case of the Koromba confirms that this community is shifting to Moore, the dominant language.

The language repertoire of the Koromba truly shows the language configuration of the 3 provinces in which they live. Moore, Koronfe, and Fulfulde are indeed the major languages in these provinces. The mobility of the Koromba, a rather weak mobility, shows through the presence of Jula, Agni, and Baule in their language repertoire. These languages were acquired during the time of their migration in the Ivory Coast. Moore has the strongest demographic weight with 384 speakers against only 153 speakers of Koronfe. Even though 525 fathers and mothers have claimed to speak Koronfe as their native language, most of their children (71.50%) consider Moore as their first language, and only 28.49% continue to speak Koronfe as their first language. Clearly, this shows that the transmission of the native language (Koronfe) to the younger generation is seriously impaired and that language shift is nearly complete. Language shift has probably already started with the 463 parents (194 fathers and 269 mothers) who adopted Moore as their first language.

The factors of the language shift among the Koromba are external and internal. The external factors, as it was shown, are mainly historical. They originated in the contact of the Koromba with the Moose intruders and in the relationship that developed between the two groups, a relationship in which the political, economical, and military predominance of the Moose is unquestionable. The demographic size of the Moose is far greater than that of the Koromba. Although it is important in some cases, the number factor has little relevance in the case under consideration. It is not always a decisive factor in language maintenance or shift. In spite of their very limited number, the Sillanko have resisted linguistic assimilation, whereas the Koromba, with wider territory and a population size that is far more important than the Sillanko, have massively shifted to the language of the dominant group. The Sillanko have a strong attachment to their language. They would spontaneously use it, unless the context imposes the use of a different language. On the contrary, the Koromba, as a group, do not seem to hold their language in much esteem, since it has been stigmatized. It is then true that language maintenance and language shift depend heavily on the attitude the group has towards its own language.

The internal factors play the most important role in the group's choice to either maintain its language or to shift to the language of the group it wishes to

identify with. The internal factors here have to do with the self-image the Koromba have toward their own group and their own language. From their language behavior, their attitudes toward their own language, and their inclination for exogamy, I am inclined to believe that the Koromba are eager to identify with the Moose. Except for the language taboos that I have mentioned, there is nothing or very little in their language behavior that shows that they value their language as a means of self-identification. The efficiency of the language taboos are uncertain, because they are not strictly respected by the younger generation.

According to Fennel (1980:39), 'a shrinking linguistic minority can be saved from extinction only by itself; and on condition that it acquires the will to save itself, and is not prevented from taking appropriate measures but assisted in doing so'. I have recently been approached by some Koromba elite who wanted to create the 'Sous-Commission Nationale du Koronfe' (National Subcommission for Koronfe). The Koromba's desire to create that commission is, I believe, a manifestation of their will to save their language. At any rate, the Subcommission offers a better chance for the survival of Koronfe than the language taboos. Learning to read and write in Koronfe is likely to reduce the current trend toward shift, and to restore the prestige of Koronfe within the community. This is possible if the government's decentralization policy is implemented with a grass roots language policy.

NOTES

[1] Several of my colleagues claim the existence of 62 or even 72 national languages in Burkina Faso without giving any information about the additional languages. For that reason, I will stick to the 59 languages that have been identified through the language survey which I conducted nationwide between 1979 and 1981.

[2] According to Ferguson 1966, 'a minor language is a language which has one or more of the following characteristics:

a) it is spoken as a native language by no more than 25% of the population and by either more than 5% or more than 100,000 people,

b) it is used as medium of instruction above the first years of primary school, having textbooks other than primers published in it'.

[3] 'Other national languages' represent a group of 35 individual languages with an average number of speakers of 12,837 people each.

[4] Kru languages are normally found in the southern region of the Ivory Coast. The presence of a Kru language in Burkina Faso is therefore quite surprising.

[5] The singular and the plural forms have different pronunciations: [ninia], [niniga] or [nina] for the singular, and [ninisi], [nininsi] or [ninsi] for the plural.

[6] The King of Sokoto in question was Ousmane Dan Fodio, a Pullo who founded the theocratic Empire in northern Nigeria.

[7] The terms Bellajo and Bellabe are Fulfulde.

[8] It is common for members of linguistic minorities to be fluent speakers of 3 languages or more.

[9] According to the 1989 census of the administrative Department of Pensa.

[10] Cf. Kedrebeogo 1995.

[11] This claim of the Koromba of Windigi (in the province of Lorum) is quite surprising because these illiterate peasants have no way of knowing about the existence of a country called Egypt. Further in-depth research is necessary to find out if this claim is to be taken seriously or not.

[12] Eighty four (84) subjects did not respond to the question related to the first language of their parents who died before they were grown up.

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