THE SUBMORPHEMIC STRUCTURE OF AMHARIC: TOWARD A PHONOSEMANTIC ANALYSIS

BY

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DISSERTATION

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ABSTRACT

Since the emergence of structural linguistics most of the linguistic studies have been conducted with the declared assumption that there is no systematic relationship between sound and meaning until a certain number of sounds are combined and arbitrarily associated with certain meanings to form the basic meaningful units known as morphemes. The pervasiveness and success of this paradigm over the decades has apparently discouraged the search for potential sound-meaning relation below the morpheme presumably because such an association is difficult to establish empirically.

This study represents an attempt to explore and address this nexus based on one African language: Amharic. It addresses the systematic correspondence between sound and meaning that is observable in the Amharic language's lexicon across varieties of roots, which are generally believed to be the basic meaningful units. Contrary to the fundamental assumption that restricts sound-meaning association to the morphemic level, the study shows that roots in the Amharic language exhibit phonetic and semantic relationship with one another. This fact suggests the existence of lower level phonetic and semantic structure that has not been recognized as meaningful, and thus substantiates similar sub-morphemic sound meaning correspondences that have been observed in various languages of the world, including the phonaesthemic analyses of English and other Indo-European languages.

The initial phase of investigation on a comprehensive database of Amharic roots extracted from Kane's (1991) Amharic-English dictionary confirmed that there is a systematic sound-meaning correspondence between roots that share subsets of their consonants to such extent that the shared semantic properties of the roots can be abstracted as the semantic descriptions of the

common sub-morphemic pairs and single consonants. The study was followed by a sound-meaning matching experiment with native speakers based on a series of constructed non-sense words/ roots and the abstracted semantic descriptions of the individual consonants. The findings showed the same results as the initial phase thus confirming those findings:

a. The cross-root semantic relations indicate correspondence in phonetic form and in semantic association between the shared components of the roots.
b. The core meaning of a root can be described as the composition of the associated semantic properties of its consonants.

Statistical analysis of the results of the experiment confirmed that the observed sound-meaning correspondences are not mere coincidences, but systematic relationships that occur at the sub-morphemic level.

To the extent that the statical analyses are correct, this finding is argued to be an important contribution to linguistic theory in general with respect to the redefinition of what constitutes the basic unit of meaning in natural language. It is suggested that form-meaning association in language trickles down to the phoneme level.

Further, with respect to Amharic and potentially other Semitic languages, the finding in this study has necessitated the dichotomization of the concept of root and etymon which is defined as the phonetic and semantic base of related stems. It is argued that this distinction is vital in understanding the morpho-semantic characteristics that occur in Amharic and related languages, and in accounting for certain diachronic phenomena in the language. The practical and theoretical implications of these findings are examined in the study.

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CHAPTER 1:

INTRODUCTION

1.1 Background

This study deals with the phenomenon of non-arbitrary relation between sound and meaning in a natural language, a highly controversial subject in linguistics, commonly known as sound symbolism. The controversy arises from its conflict with the so-called first principle of structural linguistics which asserts that the linguistic sign is arbitrary (De Saussure 1959). There are enough research findings today to affirm that the relationship between sound and meaning in linguistic signs is not so arbitrary. However, as Nuckolls' (1999) remark suggests more work is needed to make a stronger case for the subject beyond challenging the opposite view; " … linguists' claims for sound symbolism are often weak and highly qualified, as when a descriptive report of sound-symbolism patterning merely concludes that the principle of arbitrariness is not absolute" (p. 216). Not long after Nuckolls' remark came Magnus' (2001) Phonosemantic Hypothesis, perhaps the strongest claim in modern linguistics about the role of sound symbolism in the structure and function of language:

(1) The Phonosemantic Hypothesis

> In every language of the world, every word containing a given phoneme has some specific element of meaning which is lacking in words not containing that phoneme. In this sense, we can say that every phoneme is meaning-bearing. The meaning that the phoneme bears is rooted in its articulation (p. 4).

Although her study doesn't have much to ascertain the connection between the symbolism of sounds and their articulatory properties, she was able to demonstrate the significant role of sound-symbolism in shaping monosyllabic/ monomorphemic English words. The universal claim of her hypothesis needs to be tested in as many languages as possible and calls for rigorous empirical testing with data from the genetically and typologically diverse languages of the world.

The endeavor in this research as a response to that call is to provide empirical support for a moderate version of the phonosemantic hypothesis by demonstrating that in Amharic, a Semitic language of Ethiopia, the portion of the lexicon that is amenable to root-and-pattern morphology[1] exhibits a systematic sub-morphemic sound-meaning relation.

1.2 Statement of the problem

The investigation began with initial observation of two types of semantic affinity among distinct roots in Amharic sharing the same consonants in sequence. The first type is where the different roots are apparently built out of the same consonants only diverging in the vocalization and/or reduplication of the consonants in the morphological pattern they follow in deriving actual words (see **TABLE 1**).

In the traditional analysis the rows of stems in **TABLE 1** are designated different root forms as shown in the four column heads, even though on the surface the stems share the same sets of two consonants. The forms in columns 4 and 5 are differentiated by their pattern of total and partial reduplication, respectively, of the two common consonants. What led to the differentiation of the forms in columns 2 and 3 is the generalization that surface bi-consonantal stems are underlyingly tri-consonantal. This generalization is based on historical accounts of consonant reduction in so-called weak verbs[2] (Bender & Fulass 1978, Podolsky 1980). The /H/ in the representation of

[1] Root-and-pattern morphology is a system of analyzing the word formation process known as internal modification that characterizes Semitic languages. Specifically, a sequence of shared consonants among derivationally related stems is posited as a common base known as root (Moscati 1964, Arad 2005). The root is also assumed to represent a component of lexical meaning shared by the derived stems. Any other feature that accounts for the systematic variation in the derivational paradigms is represented in a form of template. A template, which is commonly known as a pattern, specifies, among other things, the length and duplication of the root consonants and the vowels to be inserted between the consonants.

[2] By the term 'weak verb' is meant any verb that has as its initial, middle or final radical a consonant which, by reason of its feebleness, gives rise to modifications in the paradigm. The weakness in question here consists in the fact that the consonant may coalesce with the vowel preceding it, so as it form a long vowel, suffer assimilation, syncopation, aphaeresis, and apocopation. (Luke, http://www.biblicalstudies.org.uk/pdf/ijt/23_1-2_129.pdf)

those roots stands for an underlying guttural consonant which is recovered from the occurrence of /a/ instead of /ä/ in the stems[3]. The historical reconstruction of the reduced consonant is motivated by the morphological comparison of cognates in related languages like Geez and also by the paradigms[4] of internal derivation and conjugation in Amharic. The reconstruction analysis seems to have added some elegance to the derivation of bi-consonantal stems from the same templates that derive tri-consonantal stems, of course, with the inclusion of some (morpho-) phonological adjustments. However, the introduction of the morphophonemes and the assignment of the bi-consonantal surface forms to different morphological bases rather obscure their semantic relatedness which can be observed on the basis of their shared consonants.

The second type of semantic affinity among different roots is the situation in which the roots share a subset of their consonants (see **TABLE 2**). The groups of stems in **TABLE 2** do not contain derivationally related members except that they share some initial or final sequences of root consonants, yet they exhibit semantic affinity to one another as indicated in the generalized glosses: *sl_* ≈ "submission", *gr_* ≈ "violent force", *_lt'* ≈ "abduction", and *_lm* ≈ "losing charm". To the extent that there are actual bi-consonantal roots from the same pairs of consonants, their semantics more or less fit the generalized glosses of those roots: *sälla* "be sharp, slender"; *gärra* "tame"; *lat'ä* "peel"; *lamä* "be fine grained". Again, the semantic relationship of the forms depends on the shared basic consonants, not on their morphology. This kind of systematic relationship is observable throughout the lexicon where there are sizable sets of stems sharing parts of their root consonants as indicated.

[3] Similarly, in the other so-called hollow/ weak verbs the reconstructed palatal and labial consonants are recovered from the change of the theme vowel /ä/: /e/ = /Y + ä/, /o/ = /W + ä/, where /Y/, and /W/ stand for a palatal and a labial, respectively.

[4] The word "paradigm" is used instead of "pattern" to emphasize the derivational and conjugational properties of the form in which the root takes shape, whereas pattern refers to the shape itself like reduplication of radicals and the intercalation of vowels.

$C^5_1C_2$	R_1R_2H	R_1HR_3	$R_1R_2R_3R_4$	$R_1R_2R_3$	**Shared Meaning**
lm	**lämma** *verdant, productive*	**lamä** *ground fine*	**lämällämä** *verdant, thrive*		***"yielding"***
lg	**lägga** *strain, stretch*	**lagä** *pare, straighten*	**lägällägä** *be tender (plant)*	**läggägä** *fall in strings (viscous liquid)*	***"supple, pliable"***
sl	**sälla** *sharp, have keen edge*	**salä** *sharpen*	**sälässälä** *wear thin, weak*	**sällälä** *become paralyzed, withered*	***"slender"***
sb	**säbba** *be fat*	**sabä** *pull, draw*	**säbässäbä** *assemble, gather*	**säbbäbä** *seek a pretext for bringing up a matter*	***"pull together"***
nk'	**näk'k'a** *wake up*	**nak'ä** *despise*	**näk'ännäk'ä** *shake, rock*		***"shake, commove"***
kl	**källa** *hinder, impede*		**käläkkälä** *prevent, prohibit*	**källälä** *to fence in*	***"retain, restrain"***
zr	**zärra** *scatter, disseminate*		**zäräzzärä** *itemize, outline*	**zärrärä** *stretch out on the ground*	***"unfold, spread"***
t'l	**t'älla** *have distaste or aversion for*	**t'alä** *throw down, drop*	**t'älät't'älä** *dangle, be suspended*	**t'älläl**ä *be clear as sediment settles, spread out*	***"suspend"***
k'r	**k'ärrä** *be left*		**k'äräqqärä** *wedge, chuck*	**k'ärrärä** *become pure due to the precipitation of sediment*	***"sink, subside"***
bz	**bäzza** *proliferate, multiply*		**bäzäbbäzä** *suck, pillage; disband*	**bazzäzä** *wander about, stray*	***"single out"***

TABLE 1: The same pairs of consonants in multiple root patterns

[5] C stands for consonant, H for a reconstructed guttural consonant, and R for radical and it specifies a consonantal position in the root. The subscripted numerals indicate sequence.

Initial pair	Gloss	Final pair	Gloss
sl_	"submission"	_lt'	"abduction"
sällämä	"faint, swoon"	mällät'ä	"remove hair, rub off skin"
sälläk'ä	"weaken, crush, subjugate"	mäsällät'ä	"draw out unsheathe"
sälläbä	"stupefy, enchant, suck up"	sällät'ä	"acculturated, polished, quick"
sällätä	"wither, wilt, become weak, exhausted"	k'ällät'ä	"melt, liquefy"
säläčča	"be tiresome, wearisome"	bällät'ä	"surpass, excel"
sälläkä	"move smoothly and noiselessly"	dällät'ä	"slip, slide, be slippery"
släwälläwä	"limp, break down"	gällät'ä	"bare, expose"
slägälläga	"be foolish, simpleton"	gäšällät'ä	"strip off, rend, skin"
sällät'ä	"become acculturated, polished, be quick"	č'ällät'ä	"to empty liquid"
sälätt'änä	"trained, able efficient, acculturated, refined"	fällät'ä	"split, crack"
gr_	"violent force"	_lm	"losing charm"
gärrämä	"be awe-inspiring, be oppressive "	allämä	"dream, have nightmare"
gorämmäsä	"grow up to be strong young man"	sällämä	"faint, swoon"
gärämmädä	"bite using all one's teeth"	k'ällämä	"sully, taint"
gärässäsä	"uproot, cause to crumble"	tällämä	"plow, infect"
gäräššä	"to return (illness), to get mad again"	wällämä	"twisted, dislocated"
gorrädä	"cut off, chop off"	zällämä	"twisted, dislocated"
gäräddäfä	"grind coarsely"	dällämä	"die out, be lost"
gorrät'ä	"open eyes wide in surprise or fright"	t'ällämä	"sink, go under"
gärräfä	"whip, scourge, lash"	č'ällämä	"get dark"
gorräfä	"fall in torrent, flood"	fällämä	"strike a blow"

TABLE 2: The same pairs of consonants at different edges of roots

1.3 The hypothesis and research questions

The situations presented in **TABLE 1** & **TABLE 2** reveal that lexical items which do not have common synchronic morphological base exhibit close semantic relation based on sharing of some phonemes in sequence. This raises a number of very interesting questions of which the following appear to be central:

a) *Are those sound-meaning relations relics of the past or living features of the language?*
b) *Are there meaningful units and discernible morphology below the root?*
c) *If those facts are indications of sound-symbolism what is the scope of sound-symbolism in the Amharic lexicon and how does it operate?*

Sub-morphemic semantic relations between words of different roots have long been observed within and across some Semitic languages. However, the explanation of the phenomenon was dominated by the diachronic perspective. An instance of the early observation of sub-morphemic

sound-meaning relation between roots is the commonly cited example in Hebrew, where a set of roots that share the initial sequence of consonants /pr/ also share the basic notion of "divide" (see Moscati 1964). Those kinds of examples were used to substantiate the claim that the tri- and quadri-consonantal roots of modern Semitic languages may have evolved from bi-consonantal origins in proto-Semitic via different mechanisms of augmentation (Ehret 1989, Hurwitz 1913, Kuryłowicz 1973, Zaborski 1991). The synchronic relevance of the sound-meaning correlation between roots of Semitic languages has only recently been brought into focus in the works of Bohas (2006) with particular reference to Arabic. He claims that in Arabic and by extension in all Semitic languages, roots sharing two of their consonants in no particular order can exhibit semantic affinity, because the shared pairs of consonants, which he calls etymons[6], are the phonetic and semantic foundations upon which the roots are synchronically built by the grammar of the languages.

The analysis of a comprehensive list of the Amharic lexicon has revealed the prevalence of sound-meaning relations between roots beyond what can be explained merely as historical connection with proto Semitic etymons suggesting that the phenomenon is rather synchronic. To pursue the possibility of synchronic sound symbolism in answering the questions that were raised in this connection the following working hypothesis is put forward:

Hypothesis:

> The consonants and their sequence in the root are the bearers of the core meaning; and the same sequence of consonants bear the same meaning even in different roots.

[6] Bohas used the term etymon to refer to an unordered pair of consonants that carries the core meaning of derivative words not in the sense of historically inherited form or in the sense defined in this study.

1.4 Goals and objectives

In order to test this hypothesis the scope of sound-meaning correlation in the language should be determined for the individual and/or combinations of phonemes over a comprehensive lexicon. Also the findings of such analysis should be tested against native speaker intuitions. To that effect, the present study is conducted with the following three objectives: 1) characterizing the semantics of sample phonemes and combination of phonemes of higher and wider distribution as sub-morphemic units from a synchronic perspective, so as to predict the core semantics of the roots which are built out of those consonants, 2) determining the structural roles of those units in the semantics of the root, and 3) validating the psychological reality of the sound-meaning correlations in the minds of the speakers of the language by administering tests of intuitions for sound-meaning correlations in made-up roots.

1.5 Theoretical framework

This study draws primarily on an electronic database of over 4,800 dictionary entries and their definitions extracted from Thomas Kane's (1990) *Amharic-English Dictionary,* the most comprehensive dictionary of its kind which compiles all the important lexicographical works on Amharic that preceded it. The primary method of investigation is classification of the entries by phonological and semantic similarities to gradually identify sub-morphemic sound-meaning correspondences. The study focuses on the component of Amharic lexicon that is amenable to root-and-pattern morphology, which accounts for the overwhelming majority of the Amharic words in the open class vocabulary. Conducting a study of this nature raises the descriptive and theoretical questions of what constitutes a root in Amharic, and whether it is an adequately viable tool or construct for analyzing and organizing the language's lexicon, especially to reveal the

morphemic and sub-morphemic levels of sound-meaning correspondence. In this section we wish to refine the concept of the root in line with the observations in the current study.

Specifically, in spite of some of the criticisms leveled against the viability of root theory as a grammatical tool (Bat-El 1994, 2003, Benmamoun 1999, 2003, Usshiskin 1999, 2000), the root remains a very systematic and economical tool to organize the lexicon of Semitic languages in general, and Amharic, in particular. However, to apply the root theory as it currently stands one must address two interrelated practical problems: a) the determination of a root as a consonantal representation of semantically related stems, and b) the determination of a unifying meaning for those stems that share a root.

1.5.1 Root vs etymon

In Semitic linguistics it is a long established practice to analyze words into consonantal roots and prosodic templates to represent the semantic and grammatical relationship between lexical items. In fact, root-and-pattern morphology is considered as the characteristic feature of the Semitic languages (Moscati 1964, Ullendorff 1977). Example (16) below illustrates the application of root-and-pattern analysis in Amharic.

(2) Root-and pattern analysis in Amharic

Root: $<C_1,C_2,C_3> = <b,r,k'>$

	Template	**Actual form**	**Gloss**
a)	$C_1äC_2C_2äC_3ä$	bärräk'ä	"lighten; thunder" (verb)
b)	$C_1C_2äC_3$	mä-bräk'	"lightening, thunder"
c)	$C_1aC_2C_2äC_3ä$	barräk'ä	"go off accidentally (gun)"
d)	$C_1C_2äC_3äC_2C_2äC_3ä$	t-bräk'ärräk'ä	"glitter, dazzle"
e)	$C_1C_2C_3$	brk'	"scarce, rare, precious"

The actual forms (2)a–e represent some of the instances of mapping of the root *brk'* to the corresponding templates. The root essentially represents all the impressions from lightning and thunder, with light and sound being the salient semantic properties.

The term "root" is ambiguous in that it has diachronic and synchronic dimensions which are not neatly separated (Podolsky 1980, Whatmough 1941). Strictly speaking, from the diachronic perspective the root is the phonetic and semantic basis of related lexical items the phonetic and semantic divergence of which can be explained by the logic of phonetic and semantic change in the evolution of a language or a family of languages. Whereas, from the synchronic perspective the root is more of a morphological base for related lexical items the phonetic and semantic divergence of which can be explained as the grammatical function of the templates in a single language. The blurring of the boundary between the diachronic and the synchronic analyses of the root can be observed in example (2) above.

To the extent that the semantic divergence can be explained as metaphorical extension of the light and/or sound of lightning/ thunder, **brk'* can be reconstructed as the diachronic root or phonetic and semantic base of all the forms at a point in the development of the language. However, the semantic divergence from "lightning/thunder" to "glitter, dazzle" or "scarce, rare, precious" cannot be explained as the grammatical functions of the templates for the synchronic morphological analysis. In other words, it cannot be generalized that the variations of the templates have systematically resulted in the semantic divergence in the actual forms in a way that can apply to other roots. Nonetheless, *brk'* is still considered a synchronic root for all the actual forms relying on the diachronic development of its semantics.

A diachronic analysis of the root is given in example (3) below. The root **ʔrg* can be reconstructed with the generalized semantics of "rise, grow up" to represent the history of the

lexical items (3)a-d before their split. The hardening of /r/ in (3)b, the total palatalization of /g/ in (3)c, and the labialization of /r/ in (3)d are the phonetic changes that resulted in the divergence of the single base. The semantic changes are not expected to systematically correspond to the phonetic changes. On the other hand, those phonetic changes cannot be systematically incorporated into regular patterns of derivation or no morphophonological process can be induced to account for the variations as synchronic relations.

(3) Diachronic development of a root

Diachronic Root: <C_1,C_2,C_3> = <*ʔ,r,g*> "rise, grow up"

	Sync. root	**Template**	**Actual form**	**Gloss**
a)	<*ʔ,r,g*>	C_1äC_2C_2äC_3ä	ʔarrägä	"rise, ascend, climb"
b)	<*ʔ,d,g*>	C_1äC_2C_2äC_3ä	ʔaddägä	"grow up, develop"
c)	<*ʔ,r,j*>	C_1äC_2äC_3C_3ä	ʔaräjjä	"grow older, age"
d)	<*ʔ,r^w,g*>	C_1äC_2äC_3-e	ʔar^{w}äg-e/ ʔarog-e	"old, obsolete"

Despite those differences, the two perspectives are often confused even in purely synchronic considerations. More cautious scholars use qualified terms such as "morphological base" to refer to the synchronic sense of the root (Bender & Fulass 1978, Goldenberg 1994, Whatmough 1941), emphasizing the fact that the stems into which the ordered sets of consonants are mapped should not only be semantically, but also morphologically related.

To avoid the ambiguity just referenced and yet reserve the term "root" for the morphological base in accordance with the tradition of root-and-pattern morphology, the present study uses the term "etymon" to refer to the phonetic and semantic base of related stems. If the distinction between the root and the etymon is to be maintained, the former would be a specific, synchronic, and morphological concept and the latter a generic, historical, and phono-semantic one.

The question that arises at this juncture is whether the distinction suggested here is a necessary one from both a descriptive and theoretical perspectives. This study would like to

argue that it is necessary for an accurate understanding of the phono-semantic relations between lexical items in Amharic and related Semitic languages.

The etymon can be viewed as a deeper level phono-semantic relation between lexical items without being constrained by morphological conditions. The root transforms phono-semantic bases into morphological bases. Morphologically unrelated lexical items may have a common phono-semantic base at the level of the etymon. Therefore, the differential aspect of the root appears to be the encoding of distinctive morphological information to the purely phono-semantic bases – the etymons. For some tangible pieces of evidence on how the root encodes morphological information to the phono-semantic base we need to look at the residual elements left behind besides the prosodic templates in the process of extracting the root consonants between closely related lexical items.

As can be observed from **TABLE 3** the outputs of stem derivation often contain consonantal elements that are neither parts of the primary consonantal base of the input nor that of the derivational paradigms. In diachronic terms those elements are known to be augments to the input set of consonants. Families of derived stems which would otherwise have the same basic consonants differ with each other by the presence/absence of those augments.

Therefore, it seems reasonable to envisage some intermediate process of root formation out of the primary consonantal bases before the application of derivational patterns. It seems that it is in this process that the primary consonantal base – the etymon – encodes morphological information to become multiple roots. Let us now consider what this augmentation process looks like.

Base	Actual form	Semantics	Template	Residue
dbl	däbbälä	"add, lump together"	$C_1äC_2C_2äC_3ä$	None
	däbb^{w}älä	"grow round"	$C_1äC_2C_2{}^{w}äC_3ä$	Labialization
	t-db^{w}äläbb^{w}älä	"become round"	$t\text{-}C_1C_2äC_3äC_2C_2äC_3ä$	Reduplication
	t-n-däballälä	"roll around"	$t\text{-}n\text{-}C_1äC_2aC_3C_3äC_3ä$	/n-/ + Reduplication
k'rt'	k'ärrät'	"cut, shape"	$C_1äC_2C_2äC_3ä$	None
	k'^{w}ärrät'ä	"cut"	$C_1{}^{w}äC_2C_2äC_3ä$	Labialization
	k'ärät'tät'ä	"cut around the edge"	$C_1äC_2aC_3C_3äC_3ä$	Reduplication
	a-n-k'ä rač'č'ä	"grit teeth, crunch"	$a\text{-}n\text{-}C_1äC_2aC_3C_3ä$	/n-/ + Palatalization
k't'r	k'ät't'ärä	"delimit; appoint"	$C_1äC_2C_2äC_3ä$	None
	k'^{w}ät't'ärä	"count"	$C_1{}^{w}äC_2C_2äC_3ä$	Labialization
	t-k'^{w}ät'at't'ärä	"control"	$t\text{-}n\text{-}C_1äC_2aC_3C_3äC_3ä$	Labialization + Reduplication
t'mr	t'ämmärä	"put, twist together"	$C_1äC_2C_2äC_3ä$	None
	č'ämmärä	"add"	$C_1äC_2C_2äC_3ä$	Palatalization
	t'ämärrärä	"tight; dry"	$C_1äC_2äC_3C_3äC_3ä$	Reduplication
slb	sälläbä	"enchant, take away"	$C_1äC_2C_2äC_3ä$	None
	šälläbä	"doze off"	$C_1äC_2C_2äC_3ä$	Palatalization
t'nk'	č'nnäk'ä	"distress, oppress"	$C_1äC_2C_2äC_3ä$	Palatalization
	t-t'änäk'k'äk'	"wary, cautious"	$t\text{-}C_1äC_2aC_3C_3äC_3ä$	Reduplication

TABLE 3: Extraction of the phono-semantic base

1.5.2 Root formation by augmentation

The augmentatives that extend phono-semantic bases into distinct morphological bases in Amharic are 1) identical/ duplicate consonants represented in roots as distinct radicals, 2) secondary features that are imposed on some radicals or blended with the vowels, and 3) affix-like additions.

1.5.2.1 Identity/ duplication

Extraction of the consonants out of stem forms before affixation gives some distinct and unique sequences of bi-, tri- and quadri-radicals such as /zk'/; /drb/; /fngl/, as well as some sequences that contain some identical radicals such as: /ll/ "loose", /fss/ "spill", /k'k'l/ "boil", /zk'zk'/ "turn upside down, /drbb/ "fill to brim", and /brk'rk'/ "sparkle, glitter". For those sequences with identical radicals, where there are corresponding roots containing only the distinct radicals, the roots in the set show a tendency of sharing some basic semantic properties.

Although some of the roots with identical radicals are commonly described in the literature as having reduplicated radicals, no formal synchronic analysis has been offered to account for their formation, except for the surface quinqui-consonantal sequences which are assumed to be derived from tri-consonantal roots by duplicating the final two consonants, a process labeled as Bi-consonantal Reduplication (BCR) by Unseth (2002).

As the BCR process crucially depends on tri-radical base with distinct radicals, Unseth (2002) explains the inapplicability of BCR on $C_1C_2C_2$ and $C_1C_2C_1C_2$ type forms by analyzing them as reduplicated versions of C_1C_2 bases. He further strengthens his reduction account of reduplicated radicals by demonstrating the conformity of $C_1C_2C_3C_3$ forms with their distinct tri-consonantal bases as they derive their BCR stems as in *t'mzz > t'mzmz* 'sinuous, winding'. The reduction analysis is maintained even in situations where no actual forms of the non-reduplicated roots exist as in ***k'ämmädä** > t-k'mädämmädä* "writhe, wiggle", or where there is no transparent semantic relationships between a reduplicated form and its non-reduplicated counterpart as in *č'äbbärä* "be dry and wrinkly" > *t-č'bäräbbärä* "be blinded by light or by a swindler".

Most of the formal pieces of evidence seem to favor the reduction of duplicate literals/consonants of derived stems to represent their bases as constituting consonants of unique identity in fixed number and sequence. The semantic relation between those kinds of stems is mostly not as obscure as often suggested: sound symbolic semantics of intensity and durativity can be generalized for the reduplication as a pattern, and some kind of core semantics can be abstracted for the sets of corresponding forms. For instance, for forms derived from sequences *kl "*hinder", *kll "*prevent", and *klkl "*fence", it is not difficult to observe a sense of "restricting; forbidding", notwithstanding, the contextual factors in the semantic divergence of the actual forms. Also a system of semantic connection can be abstracted from the corresponding forms.

However, to the best of our knowledge at least in Amharic and other Ethio-Semitic languages, there is no published research that has attempted to study the relationship between forms like *kl*, *kll*, and *klkl* so as to derive them from a non-duplicating base.

The major problem in accounting for the relationship between the reduplicative and the non-reduplicative sequences in terms of the traditional root-and-pattern morphology is that all related sequences in a set can have parallel derivational patterns instead of having complementary patterns for a single root, as shown below. With their columns of derived stems the consonantal bases can stand independently of each other.

(4) Forms of the same basic consonants contrasting along derivational paradigms

Root:	**<k,l>**	**<k,l,l>**	**<k,l,k,l>**
Gloss:	"hinder"	"prevent"	"fence"
Perfective:	källa	källälä	käläkkälä
Imperfective:	-käla-	-källl-	-käläkkl-
Infinitive:	m-klat	m-källäl	m-kälkäl
Agentive:	käl-i	källal-i	kälkal-i
Resultative:	*kl	klll	klkl
Manneristic:	a-kkälal	a-kkälaläl	a-kkälakäl

Another important fact about the root forming reduplication is that it is not as creative as stem forming (or derivational) reduplication in producing new forms. Speakers can derive verb forms on the go in the multiple derivational paradigms as in (4) from existing bi-consonantal bases, but they cannot form corresponding roots of the kind shown in (5) out of the same bases.

(5) Roots in some perfective paradigms

	Base	**Basic Perf.**	**Template**	**Redup. Perf.**	**Template**	**Gloss**
a)	bl	bälla	$C_1äC_2C_2a$	bälalla	$C_1äC_2aC_2C_2a$	"eat"
b)	fk'	fak'ä	$C_1aC_2ä$	fafak'ä	$C_1aC_1aC_2ä$	"rub"
c)	st'	sat't'ä	$C_1äC_2C_2ä$	sat'at't'ä	$C_1äC_1aC_2C_2ä$	"give"
d)	zr	z^wärä	$C_1aC_2ä$	$z^waz^warä$	$C_1{}^waC_1{}^waC_2ä$	"scatter"

If all the formal and semantic relationship between bi-consonantals and their reduplicating counterparts cannot be represented by a common morphological base, it should somehow be framed as a phono-semantic relation between different morphological bases. It is this relation that can serve as the basis for the introduction of a sub-morphemic level of representation where the etymon is the foundation of lexical formation.

The augmentation of an etymon by a duplicate of one or more of its consonants represents the process of formation of the basic morphological unit, i.e., the root, from its phono-semantic base, the etymon. For the non-reduplicating roots a vacuous formation can be induced. It is also important to note here that reduplication itself is vacuous in the sense that the repetition of a consonant, the value of which is calculated in the formation of the etymon, does not make phono-semantic contribution other than a morphological one generalized as intensity or durativity. It should be stated as a phono-semantic principle that all the consonants of an etymon must be unique to have their distinct semantic contribution. In other words, etymons cannot be contrasted based on a reduplicating consonant.

The reduction analysis also leads to recognition of uni-consonantal etymons which commonly occur in reduplicated form. In fact, almost all of the Amharic consonants form uni-consonantal etymons that take all kinds of augments to form multiple roots. Verbs like *lalla* "be loose", *sassa* "be thin", $g^{w}agg^{w}a$ "be eager", $m^{w}amm^{w}a$ "dissolve", etc. are examples of formations from augmented uni-consonantal etymons. The labialization of the consonant in the last two examples is instance of augmentation by a glide which is discussed in the following section.

1.5.2.2 The glide features as augments

Augmentation of etymons by glide features may not be easily detectable in situations where the augmented consonants absorb those features to appear as single phonemes of the language as the examples bellow suggest. In a set of phonetically and semantically minimally differentiated roots a subset may constitute pairs of roots marked by the presence of alveolar or velar consonants on the one hand, and corresponding (alveo-) palatal and labialized velar consonants on the other.

(6) Root differentiation by glide features

	Root	**Gloss**	**Root+Glide**	**Gloss**
a)	k't'r	"appoint; fix"	k'^{w}t'r	"reckon; regard"
b)	nk'r	"dip out"	nk'^{w}r	"peck, poke"
c)	t'k'm	"stitch"	t'k'^{w}m	"point, pock"
d)	gdl	"kill, eliminate"	g^{w}dl	"miss, diminish"
e)	glb	"strip off, blow off"	g^{w}lb	"shell, husk"
f)	dgm	"repeat"	dg^{w}m	"add, subsidize"
g)	krf	"scale off"	k^{w}rf	"foam"
h)	lkf	"contaminate"	lk^{w}f	"strike gently"
i)	mkr	"ponder, reflect"	m^{w}kr	"experiment, try"
j)	brk'	"lightening"	b^{w}rk'	"gambol"
k)	sfn	"prevail"	šfn	"vile, cover"
l)	t'mr	"put/twist together"	č'mr	"add, augment"
m)	frd	"dispense justice; separate"	frj	"categorize"
n)	dn	"recuperate"	dň	"restore order"

Given the striking phonetic and semantic similarities of the pairs in the sets and the considerable number of pairs, the relationship between the roots in (6) cannot be simply viewed as chance similarity or as being artifacts of some diachronic sound change. Even though the formal similarity could be described as the addition of the secondary glide features of palatalization and labialization to the first set of the pair, root-and-pattern morphology cannot account for the semantic similarities between the pairs, for there is not any applicable process of derivation that

can bring an additional feature onto a base. The most plausible way of representing the formal and semantic relationship between the pairs is to view the relationship as root formation from a phono-semantic base, in the same vine as the one proposed above to account for radical reduplication.

Like the case of the base forms augmented by reduplication, single phono-semantic base can be postulated for the pairs such that the sets containing the alveolars and the velars are augmented by the relevant glide feature to form the roots that contain the palatalized and labialized consonants. The morphophonological process of palatalization and labialization takes place once the glide features are augmented as the root formation proceeds.

1.5.2.3 Sub-morphemic affixes

The affixal elements /n-/, /š-/ and rarely /s-/[7] are known to occur in combination with the derivational affixes /t-/ and /a-/ on reduplicative stems (Zavadskaya 1988). Although their structural and semantic roles have not been studied in depth, Leslau (1997) has particularly noted the semantic property of /n-/ as being related to movement, light and noise across Ethio-Semitic languages. Yimam (1999) has also differentiated those elements from derivational affixes as root extending affixes, he has not, however, offered a formal procedure for applying those affixes to the roots.

It has also been observed in the present study that those elements consistently occur with reduplicative stems. Their function appears to be casting their bases, which may or may not have immediate onomatopoeic associations in the minds of the speakers, as sound symbolic expressions. The sound symbolisms of derivatives of /n-/ and / š-/ are mainly confined to physical properties and manners of activities such as sound, movement, or appearance.

[7] Podolsky (1991) indicates that / š-/ is, in fact, a palatalized form of /s-/ which is evident in its overwhelming occurrence preceding a velar plosive, which he demonstrated as a source of palatalization.

Particularly, /n-/ seems to signal revealing of physical properties as in *t-n- č'ač'č'a* "chatter, twitter", *t-n-k'äraffäfä* "slow", *t-n-k'äsak'k'äsä* "start to move", whereas /š-/ seems to signal more of staging or showing off of such properties as in *t- š-k'ädaddämä* "run in a race", *t- š-m^{w}änämm^{w}änä* "dress up", *t- š-k'änät't'ärä* "tossed away" .

On the one hand, those affixes are found in various derived stems of the same base, and they appear to be constituent parts of a common root. On the other hand, the same bases can be found independently of those affixes, and the affixes appear to be stem-forming. Unlike the other augments discussed above those affixes cannot be considered as primary root-forming augments. Their restricted occurrence with reduplicated roots suggests that they are applied after the formation of the reduplicated roots out of their phono-semantic bases. Also the relative independence of the reduplicated bases of the augments suggests that they are secondary. Therefore, it is reasonable to consider those augmentatives, following Yimam (1999), as root-extending sub-morphemic affixes to differentiate them from the derivational ones. Adhering to their affixal nature their semantic role is more of grammatical than lexical.

The term etymon may tend to connote a sense of reconstructed root, leading to an incorrect conclusion that it is synchronically less relevant. However, as discussed above, in situations where the same basic sequence of consonants are predictably extended to form separate morphological bases, the best way to account for the formal and semantic relationship between the extended forms in terms of the basic sequence of consonants they share is to postulate the etymon as a synchronic concept. The findings of the present study strongly support the idea of the etymon as a living feature of Amharic, and probably of other Semitic languages, on which synchronic morphological bases of root-and-pattern morphology are anchored. The phonetic and semantic relations represented by an etymon which run through morphologically diverse lexical

items within a language and across families of languages can be scrutinized in relatively smaller number of phono-semantic units uniting even morphologically unrelated lexical items.

1.5.3 Phonological issues

In addition to the morphological issues presented above (Section 1.5.2), one of the challenges in dealing with sound-meaning correspondence is determining the phonemic basis of lexical items against sound changes/ alternations, especially the less regular and the sporadic ones. There appear to be several sets of roots that are phonetically minimally differentiated while they exhibit semantic commonalities so as to be considered for possible shared etymons. Systematic and consistent patterns of sound change in the language can help connect some of the phonetic variations in those roots. Where such patterns of sound change are not established some lexical items with altered phonetic forms may escape proper treatment.

It is clear in the case of the pairs of roots shown in (6) above that the palatalized and labialized consonants are variants of respective alveolar and velar phonemes that are formed by the addition of the corresponding features. That means the palatalized and labialized consonants are not simple phonemic units. Their composite nature is evident in the morphologically conditioned palatalization and labialization under some derivational processes. Also the morphophonology of palatalization and labialization are better understood when the agents of the changes are posited as sub-segmental phonemes[8]. Even more important is the fact that the alveolar and velar consonants cannot co-occur with their palatalized and labialized counterparts in a root due to the effect of the phono-semantic principle that bars identical phonemes in an etymon: For the co-occurrence to be permitted, the root to be formed by the glide augmentation must initially have identical consonants at the etymon. All those observations indicate the

[8] See Zoll (2001) for the analysis of the Amharic instrumental affix as containing a floating palatal feature.

systematic behavior of the glide features in root formation to support Podolsky's (1991) position to eliminate the (alveo-) palatal and labialized velars and instead represent the palatal and the labial features as phonemic elements.

There is another set of roots that exhibit semantic similarity and are minimally differentiated by consonants that can be related by a sound change of weakening or strengthening of one or the other of the alternating consonants.

(7) Roots minimally differentiated by weakening or strengthening of a consonant

	Root	**Gloss**	**Root**	**Gloss**
a)	*fk'r*	"like, love"	*fk'd*	"desire, will";
b)	*kbr*	"exalt, high regard"	*kbd*	"weigh heavy"
c)	*t'mr*	"put together, pair"	*t'md*	"tie together"
d)	brk'	"lighten, shine"	wrk'	"glisten, sparkle"
e)	blt'	"surpass"	wlt'	"slip"
f)	blg	"misbehave"	wlg	"slip away"

Note, however, that inasmuch as the semantics of the pairs are close to one another and as plausible the sound changes that may have resulted in the contrastive alternation of the consonants are, the pairs of roots in (7) cannot be reduced to common etymons in a principled manner, because the sound change is not systematic and consistent throughout the lexicon. No element can be identified as being augmented to one set of the pairs to form its counterpart other than to attribute the difference to some historical phonological process of strengthening or weakening of one of the contrasting phonemes in the pairs to form the other. In clear contrast with the pairs differentiated by glide augmentation, the alternating consonants in the pairs in (7) do co-occur within the same root. For example, the alveolar pairs /r/ and /d/ can co-occur as in *drb* "lay over", *brd* "cool", or *gdr* "have/lose footing"; and the labial pairs /b/ and /w/ can co-occur as in *wlb* "flap", *wbk'* "humid, sticky", *wsb* "intertwine". If one of the consonants was the

augmented variant of the other their co-occurrence would have violated the phono-semantic principle. Therefore, unlike the alveolar vs. palatalized consonants or velar vs. labialized consonants, those pairs are phonemes in their own and are also phono-semantically distinct to contrast different etymons.

The augmentative function of the glide features is more visible in bi-consonantal roots reflected in the variation of the vowels that differentiate otherwise identical roots. The view that bi-consonantal roots are underlyingly tri-consonantal makes implicit or explicit historical reference. The claim is that those roots were originally tri-consonantal and have lost one of their radicals. The evidence is recovered from the pattern of variation of the theme vowel in surface bi-consonantal forms, i.e., the mid central vowel /ä/ found in most derived stems. Within the root-and-pattern morphology the distributional properties of the seven Amharic vowels, usually listed as phonemes, are described as follows: the high central vowel /ï/ is an epenthetic vowel (Hetzron 1964, Hayward 1986, Podolsky 1991). The front vowels /i/ and /e/ are known as palatalized versions of the central vowels /ï/ and /ä/ influenced by a surrounding palatal feature. Similarly, the back vowels are known as the labialized versions of the same central vowels influenced by a surrounding labial feature. The low central vowel /a/ is known as the lowered version of the mid central vowel influenced by a surrounding guttural feature. The influencing features are believed to be the remnants of historically lost consonants.

Whether it is due to the historical loss of those consonants or to a later analogical creation, Amharic has formed a large number of bi-radical roots many of which may not be linked to the larger Semitic stock, nevertheless, they function indistinguishably in the root-and-pattern morphology to be considered "perfectly 'respectable' reasonable Semitic roots" (Appleyard 1979). To be consistent with the synchronic facts root analysis should represent observable

features than simply referencing the lost consonants. The phonological features that mark the distinction between otherwise identical bi-radical roots are labial, palatal, and guttural features, collectively known as glide features, associated with the theme vowel[9]. In a similar argument by which we endorsed Podolsky's (1991) abstraction of palatal and labial features from palatalized alveolars and labialized velars, we can abstract the same features from the peripheral vowels, and also the guttural feature from the low vowel to represent all the glide features as distinct phonemes and consequently to reduce the vowel phonemes of Amharic into /ä/[10].

Considering the fact that nearly all bi-consonantal roots carry at least one of those glide features, and that those with the same radicals are contrasted by such features, it is reasonable to conclude that the consonants constitute the etymons and the glide features are augmented to extend the etymons into roots. The separation of the glide features from both the consonants and the vowels permits us to answer the question of whether the root should carry some information about its vocalization. The presence or absence of a glide feature in the root determines the quality of the vowel.

1.5.4 The semantics of the root

The task of determining the semantics of a root that is representative of all the derivatives cannot be accomplished directly by selecting some common descriptions of meanings of the derivatives from the dictionary definitions, because the usage based definitions focus on pragmatic and contextual factors that mask the linguistically inherited semantic properties. In the absence of an elaborate semantic theory to guide our analysis of lexical meaning or a standard meta-language to enable us to state meanings as absolute values of the lexical items, the option is to use expressions that can describe lexical meanings as much as possible in a context-free

[9] Those features are among the elements Diakonoff (1965) called 'vocalic sonants', which he hypothesized to have extended the original bi-consonantal roots of Semitic into tri- and quadru-consonantal ones.
[10] See Beyene (1972) for a similar argument to reduce the phonemic vowels of Amharic into /ä/.

manner. So, I have framed the analysis of meaning at the root and sub-morphemic level on the assumptions stated below.

This study generally assumes, without subscribing to the formalism of semantic primitives or features, that lexical meaning is decomposable and not monolithic. If the abstraction of a common etymon or root for multiple derivatives is any indication that those derivatives can also be semantically related, then there must be some invariable elements of meaning running through all the derivatives. This is not to deny that the semantic relations are not always transparent at surface. Semantic divergence ranging from simple twist to extreme deviation that cannot be explained as the functions of the grammatical formations should be attributable to the variable contextual factors. The alteration to the inherited semantic elements of the root could also be visualized as resulting from the activation/ deactivation of some semantic elements, restructuring of the existing elements, or as the dynamics of interactions between semantic elements. The degree of sematic transparency may be correlated with the extent of the alteration.

Also regarding the differentiation of meaning along denotational-connotational or referential-associative dimensions, the study follows Magnus (2001) in assuming that sub-morphemic semantics tends to be connotational or associative. Denotation or reference being a fixed relation between a symbol and a (concrete) object or an (abstract) concept, there is no internal structure to such a relation especially when the symbol is mono-morphemic. Therefore, sub-morphemic components cannot bear strictly referential elements of meaning. This argument is better understood in light of the enactive approach to language as a cognitive behavior as elaborated by Bottineau's (2010), as part of the new paradigm in the cognitive sciences.

According to this approach, meaning is not something that is encoded in linguistic units, the latter being symbols by which we refer to some pre-existing reality, objective or mental. Rather,

it is an experience embodied in the linguistic units and brought forth (enacted) by people's use of language in the effort of making sense of their environment. And linguistic units are sub-actions yielding specific cognitive contribution to the general orchestration of the sense-making process. An important contribution of his view in sub-morphemic study is his effort to substantiate the function of sub-morphemic units as "experiential classifiers of lexical networks" (Bottineau 2008). Similar suggestions were also made in the works of Bolinger (1965), Rhodes & Lauler (1981). This view of the function of sub-morphemic units conforms to the associative or connotational aspect of meaning expected of the sounds of language.

To summarize, we laid out our approach to the problem of sound-meaning relation in Amharic first by exposing the limitations of root theory in addressing the issue. Then we indicated that as a morphological concept, the root only represents the sound-meaning relations of morphologically related lexical items. Extending on the diachronic dimension of the concept of the root we proposed a new perspective in which the phono-semantic relations of lexical items are considered outside of morphology. The etymon, which was basically a diachronic concept, was reintroduced as a synchronically very relevant phono-semantic unit that serves as a base for roots and consequently for all related lexical items. The relation between the etymon and the root was defined as a transformation from the sub-morphemic level to the morphemic realized by phonetic augmentations of the etymons to form various roots. The phonetic augmentations: glide insertion, reduplication, and sub-morphemic affixation were presented all as sub-morphemic operations. The role of phonetic augmentation in shaping the roots was further discussed under phonological issues where the possible single phonemic vowel hypothesis of Beyene (1972) and Podolsky (1991) was supported as vocalic variation in the stems was explained as the consequence of glide augmentation. We also took a position that we would assume lexical

meaning is essentially associative and by extension sub-morphemic semantics would also be associative.

1.6 Organization of the dissertation

The remaining portion of the dissertation is organized as follows. By way of introducing the language to new readers a brief discussion of the background of Amharic and an overview of its structure are provided in Chapter 2. The previous literature related to the topic of the current study are reviewed in Chapter 3 to highlight the various views about the place of sound symbolism in the overall endeavor of understanding the nature of language. The various approaches to the problem are briefly discussed in sections with some representative works. We will also look at some of the works pertaining to sound-symbolism in Semitic languages. Chapter 4 lays out the organization of the raw data into a database and the procedures followed to analyze them. Then the phono-semantic properties of the sub-morphemic units are described beginning with phonaesthemic sample pairs of consonants followed by individual sample consonants. The final section of Chapter 4 also discusses the interaction between the phonemes within the etymon. Chapter 5 presents the results of the experiment undertaken to validate the conclusions derived from dictionary data analysis. The design and administration of the experiment are given in the first section. The descriptions of the subjects' responses to the questionnairs and the statistical tests on the responses are followed by the interpretations of the test results. The conclusions and the implications of the findings are given in Chapter 6.

CHAPTER 2:

THE STRUCTURE OF AMHARIC: AN OVERVIEW

2.1 Introduction

The analysis that is to be presented in Chapters 4 and 5 will suppose some familiarity with the structure of Amharic, especially with respect to aspects of its phonology and morphology. In order to familiarize the reader with the language and thus hopefully facilitate the critical understanding and appreciation of the issues that will be addressed, this chapter offers an overview of the sociolinguistic profile, the historical background, and the major structural properties of the Amharic language. Specifically, it discusses its use to profile the language, its genealogy and spread to situate it relative to other Ethiopian languages, and its structure to outline the phonological and morphological features that are fundamental to the current study. The discussion begins with the sociolinguistic profile of Amharic.

2.2 Sociolinguistic profile of Amharic

Amharic is a Semitic language spoken in Ethiopia where many of the living modern languages of the sub-family are found. It has the second largest number of speakers among all Semitic languages next to Arabic. According to the 2007 census report of the Central Statistics Authority of Ethiopia, Amharic is spoken as a mother tongue by an estimated total population of 21.6 million (29.3% of the total population of the country). In terms of urban / rural distribution, 48% of the urban and 25.7% of the rural populations speak Amharic as a mother tongue. Given the total urban population of 5.7 million and the dominance of Amharic particularly in urban areas one can expect that a considerable number of this population speaks the language as L2 (see the CSAE Report). It is also known that a good number of the Ethiopian diaspora speaks

Amharic as L1 or as L2. The ethnological information resource webpage, Ethnologue estimates that there were additional 200, 000 speakers of Amharic around the world as of the year 2007.

Even though its cultural base is roughly the current Amhara administrative region or the central and western regions of the country, it is well distributed in most urban areas across the country except in the peripheries. It is a statutory official working language of the federal government, four regional states as well as two city administrations including the capital, Addis Ababa. It has inherited the uniquely Ethiopian writing system of the Ethiopic Script from its predecessor, Geez. Written records in the language can be traced as far back as the early fourteenth century. It has been a language of education (both as a medium of instruction and as a subject), a language of mass media, and a language of administration.

2.3 The evolution of Amharic

Amharic belongs to the Semitic sub-family in the Afroasiatic family of languages as classified by Greenberg (1966). Within the Semitic sub-family it is one of some 14 languages in Ethiopia and Eritrea that make the Ethio-Semitic branch. Ethio-Semitic splits into North and South with most of the modern languages including Amharic making the South Ethio-Semitic (SES). As the SES further splits into the Outer and Transversal, Amharic and its closest relative Argobba are separated from the Southern Transversal SES.

The origin of Amharic has not been traced with reliable evidence. Awgichew's (2009) account of the evolution of Amharic, which disputes the pidgin origin hypothesis of Bender and Fulass (1978) with respect to the period and the place of origin and the nature of the evolution, suggests that Amharic might have evolved as a proto-Amharic-Argoba within South Ethio-Semitic splitting from Argobba before the 10th century in the central region of today's Ethiopia

(as shown in the family-tree of Amharic in **FIGURE 1** below). By the end of the thirteenth century when the Amhara kings took power Amharic began to assume the status of "the language of the kings" replacing Geez, the classical language of Ethiopia (Cooper 1976, Awgichew 2009).

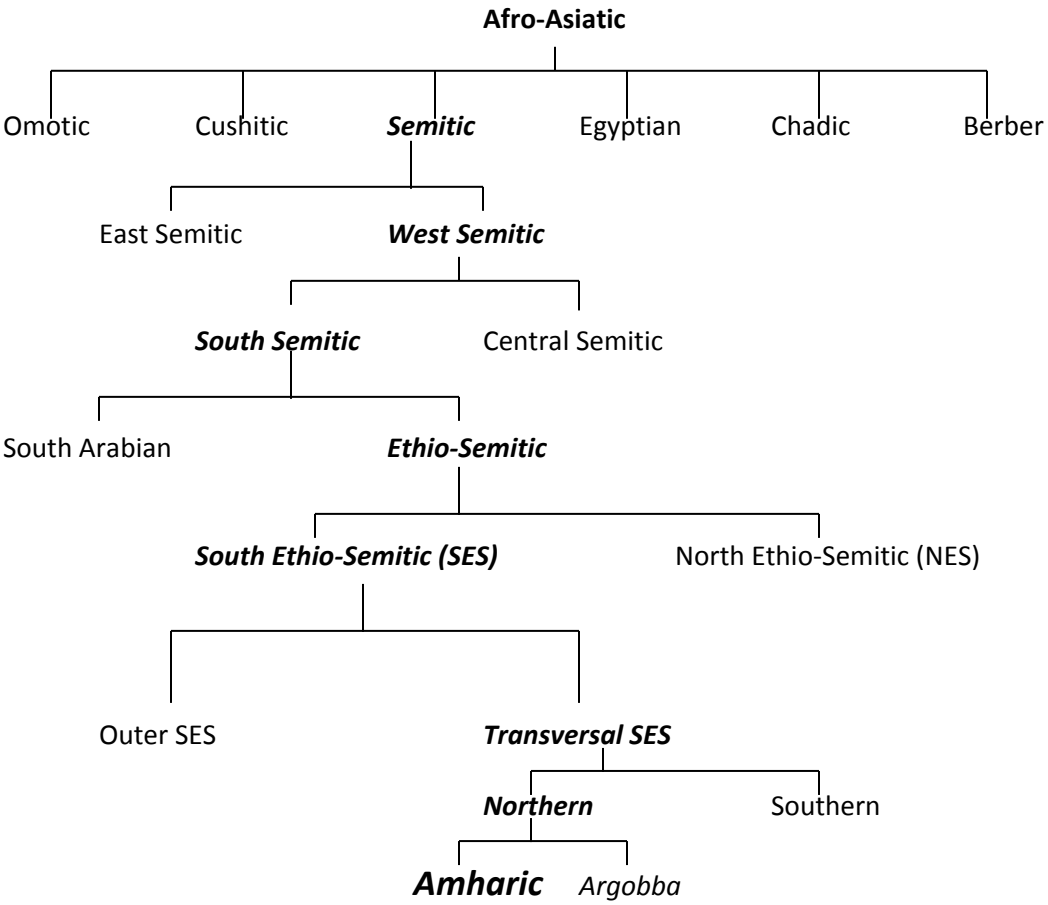


FIGURE 1: The classification of Amharic in the Semitic Family (Ethnologue)

With the expansion of the Ethiopian state under the Amharic speaking ruling class the language spread beyond its cultural base to become the lingua franca of the diverse linguistic communities of the country. As it was spoken alongside other Semitic and non-Semitic languages of the country Amharic has influenced and been influenced by those languages. The outcome of the centuries of mutual influence among the multitude of languages is the

development of linguistic features that define an Ethiopian language area across the different genealogical groups and sub-families as observed in the Balkans, the Caucasus, or South Asia (Ferguson, 1976). Amharic carries many of those lexical, phonological, and syntactic features along with the distinctive Semitic morphological feature of root-and-pattern which firmly classifies it as a Semitic language (Ullendorff 1977, Appleyard 1979).

2.4 The Structure of Amharic

Amharic is one of the well-described and studied languages of the country. Particularly, the complex phonological and morphological aspects of the language had attracted the attention of many linguists. In this section we will highlight the important phonological and morphological features of the language which are useful in understanding the phono-semantic structure of the language.

2.4.1 The sound system

Amharic presents a complex sound system that characterizes many of the Ethio-Semitic languages. Particularly, the sub-segmental features of labialization, palatalization, and gutturalization are the salient features in the phonology and morphology of the language. In our brief outline of the sound system of the language below we will focus on the segmental, sub-segmental, and the supra-segmental features as well as the syllable structure of Amharic.

2.4.1.1 Phonemes

Podolsky (1991) noted that there is no agreement among scholars about the number of phonemes in Amharic. Different scholars at different times suggested 22-34 consonantal and 1-7 vocalic phonemes (Ullendorff 1955, Leslau 1995, Yimam 1995, Beyene 1972, Podolsky 1991). Regarding the consonants, there is no dispute about the phonemic status of the labials: /b, f, m/;

the coronals: / t, t', d, s, z, n, l, r/; the velars: /k, k', g/ and the glides: /w, y, h/. The controversy mainly surrounds the labialized consonants: /k^w, k'^w, g^w, h^w/ and the palatalized consonants: /č, č', j, š, ž, ň/. With regard to the vowels, all the peripheral vowels /i, e, ï, a, u, o/ are disputed sparing only the mid-central vowel /ä/. Those scholars who consider the labialized and palatalized consonants and the peripheral vowels as independent phonemes rely purely on the traditional phonemics method of lexical contrast to determine the phonemic status of the sounds (see Leslau 1995). Those scholars who reject the phonemic status of the above mentioned sounds emphasize the system of relation between the sounds in the phonological and morphological system of the language.

As it will become clear later in the discussion the issues involved in the controversy of the phonemic status of the consonantal and the vocalic sounds of Amharic are essentially the same. Let us first consider the vowels. The issue of the Amharic vowels was brought into focus in the studies on the verb morphology of the language. Beyene (1972), Bender and Fulass (1978) and Podolsky (1980) in their respective studies exposed the problem of the traditional 7 vowel system and suggested their alternative analyses. They all agree that the phonemic vowels of Amharic which operate in the root-and-pattern morphology are far fewer than 7. Their analyses were driven by the desire to represent the verbal system in as minimal number of patterns as possible. In his unpublished PhD dissertation Beyene took a radical step in reducing Amharic into a monovocalic language:

> Among the vowel phonemes ... the only systematic phoneme is the mid-central unrounded vowel /ä/. … the front vowels /i/ and /e/, the central vowels /ï/ and /a/, and the back vowels /u/ and /o/ can be derived from the systematic vowel phoneme /ä/ by means of rules and are thus excluded from the inventory of the systematic vowel phonemes of Amharic. (1972: 217)

Although Bender and Hailu (1978) were initially critical of Beyene's move for being "unmotivated both psychologically and phonologically" (p. 19), they also acknowledge that the "analysis seem to have some plausibility since the reduction processes he posits do occur" (p. 19). Their concern seems to be that of representation as they indicated: "... it is hard to see how the use of digraphs (ïy, for i, äw for o, etc.) would lead to a workable set of lexical base forms at all morphological rules" (pp. 19 - 20). Ironically, the crucial steps in their achievement to lay out the hitherto most systematic explanation of the verbal system of Amharic were their recognition that "high vowels [i], [ï], [u] do not occur in verb forms until introduced by rules" (pp. 21 -22) and their introduction of "/w/, /y/, /h/[11] in base forms to 'predict in' later occurrences of [o], [e], [a], respectively" (p. 22) to explain deviations away from what they called "the normal ä". Their analysis indirectly endorses Beyene's assertion.

Podolsky (1980) made a similar generalization that "...all verbs having /o/ or /e/ after one of their radicals are viewed as having a labialized resp. palatalized radical, but belonging to a regular *-ä-ä-* pattern" (p. 447) and was able to demonstrate that the types of verbal stems could be reduced from dozens into just four. Also he seems to have produced a conclusive argument to the debate which continued ever since Hetzron (1964) raised the issue of the phonemic status of the high central vowel [ï]. Podolsky concluded that in modern Amharic the vowel [ï][12] is not a phoneme; it is an epenthetic vowel. Moreover, he convincingly argued that the peripheral vowels of Amharic are surface forms of the palatalized and labialized central vowels [ï] and [ä] thereby

[11] Podolsky (1991) replaces those consonants by what he called morphophonemes: labialization, palatalization, and gutturalization, respectively.

[12] The high- and the mid-central vowels of Amharic are confusingly represented in the literature by the schwa [ə]. Those who use [ə] for the high-central vowel mostly use [ä] for the mid-central vowel. In other cases [ɨ] and [ə] are used as IPA representations of high-central and mid-central vowels, respectively. Bender and Fulass (1978) use [ɪ] for the high-central, and [ə] for the mid-central vowels. For ease of presentation we have unified the symbols as: [ï] for high central and [ä] for mid central vowels. It is useful to note here that Devens (1983) who conducted acoustic examination of the mid-central vowel concluded that the properties of the vowel match the standard IPA character [ɘ].

reducing the phonemic vowels of Amharic to /ä/ and /a/. The insights that contributed to the explanatory power of his analysis were: a) his assumption of special morphophonemes in place of diachronically lost radicals: /X/ for glides and /H/ for gutturals; and b) his introduction of palatalization, labialization and gutteralization[13] as the association to the surrounding consonants and/or vowels of remnant features of lost glides and guttural consonants.

Podolsky's (1991) findings impact not just the vowel system of the language but the overall phonemic inventory. His revised chart of the consonantal inventory eliminates the palatal vowels and includes those morphophonemes /X/ and /H/ as well as the processes of palatalization, labialization, and gutturalization of most consonants[14].

(8) The Amharic phonemic chart of consonants (Podolsky, 1991: 61)

(p)	t	k		
(p)	ṭ	ḳ		
b	d	g		
	f s	x	(h)	
	(v) z			
	(ṣ)			
m	n			
w	l	r	y	

two morphophonemes X, H
± palatalization and/or labialization of most consonants
± "gutturalization" of most consonants.

The exclusion of the palatal consonants from the phonemic chart with the assumption that they can be derived from corresponding alveolars via palatalization appears to have missed the

[13] Podolsky introduced the concept of gutturalization to account for the surviving diachronic high central phonemic vowel. However, it can also be induced to explain the lowering of the central vowel thereby to further reduce the vocalic phonemes to one—/ä/.

[14] It is not clear what he meant by 'gutturalization of most consonants' since he has not discussed that statement. Gutteralization is understood only as the lowering or the acquisition of the [+low] feature by the mid central vowel /ä/ to become /a/. It is called gutturalization because the feature is associated with consonants generally known as gutturals from their uvular, pharyngeal, or glottal place of articulation.

synchronic stability of those sounds in the roots, on the one hand. On the other hand, the inclusion of palatal and labialized consonants as independent phonemes also misses an important aspect of the morphophonology of the language: that the palatal and labial features have relative independence that they can be introduced to stems as part of affixes without prior anchorage on a consonantal vocalic skeleton (see Zoll, 2001 for her floating feature argument). Besides the simplification of the phonemic system of the language, the representation of the labial, palatal, and guttural features instead of the consonants modified by those features offers a simpler explanation for sound-meaning correspondence between roots observed in the current research. Therefore, in this study we adopt the phonemic analysis which identifies the mid-central vowel /ä/ as the only phonemic vowel of Amharic and Podolsky's (1991) listing of the consonantal phonemes, morphophonemes, and the sub-segmental features.

Notice that on the above phonemic chart all the borrowed consonants, including /s'/, are placed in parenthesis to mark them as non-essential for Amharic. In structural terms [s'] free-varies with [t']. It is commonly found in borrowed words from Geez. Its occurrence in words that are considered as basic to Amharic is attributed to dialectal and/or sociolectal variation (Takkele, 1992). Therefore, there is no reason to maintain [s'] as a distinct phoneme alongside [t'].

Since the basic stock of words in the language are derived through word formation involving root-and-pattern and affixation, the elements identified as constituting the phonemic inventory of the language conform with the phonological manifestations of the structural units that take part in root-and-pattern morphology. It is important to note here that emphasizing word meaning contrast alone to determine the phonemes of Amharic, particularly, on the basis of non-derived and borrowed words may require maintaining the palatal consonants and the peripheral vowels as phonemic, which hampers simpler representation of root-and-pattern morphology of the

language. If phonemic contrast needs to be the basic criterion of the non-derived section of the lexicon, where words cannot be reduced to roots and patterns or stems and affixes such as in *bet* "house", *ïjj* "hand", *č'ïk'k'a* "mud" or borrowings like *mäkina* "car", *wïšša* "dog", *č'amma* "sole, shoe" , may need a separate set of phonemes.

2.4.1.2 Non-Segmental Features

In addition to the segmental phonetic features which are composed into particular consonants, the sound system of Amharic has a non-segmental feature of length, which distinguishes segments of the same articulatory features based on relative length of time they take to be articulated. A consonant may be articulated with extra length (germination) to contrast with its identity of normal length. Geminating a consonant in a word may result in a change of meaning as in *gäna* "not yet" and *gänna* "Christmas", *wana* "swimming" and *wanna* "major". Most importantly, gemination plays a role in contrasting the patterns of derivation and inflection in the verb system of Amharic.

There are no particular pitch patterns associated with words or morphemes to recognize tone or stress as important phonological features in Amharic. However, homophonous forms of different grammatical categories such as: *bïla* "eat (second person masculine imperative)" and *bïla* "(she) saying", *šïro* "(he) renouncing" and *šïro* "powder from roasted pea", may be distinguished by relative pitch in the intonation of their clause. Variation in pitch is important to differentiate between functions of phrases and clauses. For instance, statements and yes/no questions are composed in Amharic with the same words in the same order. The difference is marked by the pitch trend along the articulation of the words. Therefore, the relevance of the non-segmental feature of pitch in Amharic is in terms of intonation, not tone or stress. The case of homophonous forms in the above examples can also be explained as a difference in intonation.

2.4.1.3 Syllable structure

The principles of simplicity and distinctiveness of articulation are maintained via the rules of sequential arrangement of segments, namely, phonotactic rules imposed by the syllable structure of a language. The following examples demonstrate the syllabification of Amharic consonants and vowels.

(9) The syllable structure of Amharic

a) *gä.bä.ya*	b) *dïn.gay*	c) *'af*	d) *'ïbab*	f) *lïbb*	e) *k'ïrb*
"market"	"name"	"mouth"	"snake"	"heart"	"nearby"

As illustrated above, Amharic has CV, CVC and CVCC syllable types. Some linguists multiply the number of the syllable types by including onsetless syllables (Yimam, 1995). However, the initial vowels in those syllables as in (9)c and (9)d are obviously pre-glottalized suggesting a remnant glottal feature. It is also important to note that the only vowels that can occur in initial positions are the central vowels [ï] and [a]. According to Podolsky (1991) those are the vowels that bear gutteralization. If there are other vowel initial words they are borrowings.

There are no diphthong vowels and no contrastive vowel length in the language. The heavy syllable type CVCC is limited to word final positions. The branching coda of those syllables may represent a geminate consonant as in (9)d or a cluster of different consonants as in (9)f. Impermissible clusters of consonants are separated by the epenthetic vowel [ï].

2.4.2 Word Formation

The morphology of Amharic, like that of other Semitic languages, is mainly based on root-and-pattern system. Roots are the skeletal frames of words built with sequences of commonly three but also two to four consonants known as radicals. The patterns are the templates that determine the variation in length and repetition/ reduplication of the radicals and the insertion of

vowels in the derived stem. With the exception of words borrowed from non-Semitic languages, the majority of Amharic words can be analyzed into roots-and-patterns. In addition to root-and-pattern variation, Amharic utilizes multiple morphological processes such as affixation, reduplication, and compounding to form new words. Let us briefly examine the role of the different morphological processes in the word formation of Amharic.

2.4.2.1 Root-and-Pattern variation

The process of pattern variation is applied mainly to derive new verbal and nominal stems. However, this process is not limited to the derivational morphology. The four conjugational stems of verbs are also formed by pattern variation. The various verbal and nominal patterns of the Amharic morphology are given below. The consonantal radicals in the roots and stems are schematically represented by "C" with subscript numerals to indicate their left-to-right order. The non-phonemic (epenthetic) vowel [ï] is left out in the pattern representation, because it can be predicted wherever impermissible cluster of consonants occur.

2.4.2.1.1 Verbal Stem Patterns

(10) Derivational Patterns in Tri-radical Stems

Pattern I	**Pattern II**	**Pattern III**	**Pattern IV**	**Gloss**
$C_1äC_2C_2äC_3$	$-C_1aC_2C_2äC_3-$	$C_1äC_2aC_2C_2äC_3-$	$C_1C_2äC_3äC_2C_2äC_3-$	
säbbär-	*sabbär-	säbabbär-	*sbäräbbär-	"break"
fälläg-	*falläg-	fälalläg-	*flägälläg-	"search, track; want"
*šäkkär-	šakkär-	*šäkakkär-	*škäräkkär-	"friction; roll"
*däbbel-	*dabbäl-	däbabbäl-	*dbäläbbäl-	"lump, thicken"

It should be pointed out here that not all possible stems are derived to actual forms. Pattern I and Pattern II represent wide variety of meaning and are mainly complementary with each other, that roots with no actual stem in Pattern I may have one in Pattern II and vice versa. Quadri-

radical roots behave more or less in the same fashion as tri-radicals with respect to those derivational templates except that Pattern IV does not apply to them.

The semantics of Pattern III can be generalized as distributive of the event of the root. The derivation of actual stems in Pattern VI suggests a sound symbolism of the root meaning. It adds intensity and continuity to the root meaning. A native Amharic speaker can feel the sound symbolism of such roots as *brk'* "flash, glitter"; *škr* "*friction*"; *lfs* "*be slack*" from their derivation in Pattern IV. However, Pattern IV is limited to fewer roots and can only derive potential stems, which need affixation prior to actualization. Apparent semantic deviation from other actual stems of the same root is felt, because this pattern emphasizes the symbolism of the sounds in the root more than other patterns as noted by Unseth (2001).

The Amharic verb morphology is known to have four inflectional patterns which express grammatical categories of tense, aspect and mood. The patterns are given below with their traditional labels.

(11) Inflectional (Conjugational) Patterns

Perfective	**Imperfective**	**Gerundive**	**Imperative**
$C_1äC_2C_2äC_3$-	-$C_1äC_2(C_2)C_3$-	$C_1äC_2(C_2)C_3$-	-$C_1C_2äC_3$- /-$C_1äC_2C_2C_3$-
säbbär-	-säbr-	säbr-	-sbär-
fälläg-	-fällïg-	fällïg-	-fällïg-

The two roots in the example represent two classes of verbs known in the literature as Type A (*sbr*) and Type B (*flg*) for their variation in geminating their penultimate radical in three of the conjugational patterns except in the perfective. Type A verbs geminate their penultimate radical only in the perfective paradigm, whereas Type B verbs geminate the same radical throughout the conjugations. The conditioning of the variation is still awaiting explanation.

Note that in terms of consonant and vowel patterning the imperfective and the gerundive forms are the same. Their variation is in the affixation of agreement elements. The imperfective form takes both prefix and suffix agreements, whereas the perfective form takes only suffix agreements. Other inflections of the verb are realized syntactically as the base verbs form their respective phrases.

2.4.2.1.2 Nominal Stem Patterns

The nouns and the adjectives of Amharic that have roots in the morphological system of the language are realized in any of the following stem patterns:

(12) Tri-radical nominal patterns

	Root	**Nominal**	**Gloss**
a)	$C_1C_2C_3$	lïbs	"cloths"
b)	$C_1C_2C_2C_3$	dïggïs	"feast"
c)	$C_1äC_2C_3$	k'äld	"joke"
d)	$C_1C_2aC_3$	dïgaf	"support"
e)	$C_1äC_2äC_3$	zäfän	"song"
f)	$C_1äC_2C_2aC_3$	käbbad	"heavy"

Depending on the currency of the meaning of the root the derivatives of those patterns may assume some generalized meanings about the root such as (12)a and (12)b "resultative of the root", (12)c- e "instance of the root", and (12)f "qualified by the root". Although the examples in (12) are based on tri-radical roots bi- and quadri-radical roots also follow similar templates only the latter adjusted to the number of radicals of the root.

There are a number of nominals that are not derivationally related to a root. These include words such as *säw* "human being", *jïl* "fool", *däha* "poor", etc. that are apparently rootless.

2.4.2.2 Affixation

Derivational affixes are attached to potential and actual stems to derive fully functional words in the verbal and nominal categories. Inflectional affixes introduce specific grammatical functions to actual stems. The derivational affixes of verbs are the causative /*a*-/ (also *as*-, and *aC*$_1$-) and the passive-reflexive /*t*-/. The two affixes derive causative and passive-reflexive stems from the outputs of different patterns. The /*as*-/ and /*aC*$_1$-/ prefixes derive causative of the passive (see Ayalew, 2011).

(13) Derivational verbal affixes

Affix	**Pattern I**	**Pattern II**	**Pattern III**	**Pattern VI**	**Root meaning**
	$C_1äC_2C_2äC_3$	$-C_1aC_2C_2äC_3-$	$C_1äC_2aC_2C_2äC_3-$	$C_1C_2äC_3äC_2C_2äC_3-$	
	färräs-	*farräs-	färarräs-	*fräsärräs-	"crumble"
a-	afärräs-	*afarräs-	afärarräs-	*afräsärräs-	
t-	*täfärräs-	*täfarräs-	*täfärarräs-	----------	
as-	asfärräs-	*asfarräs-	asfärarräs-	*afräsärräs-	
	*gäbbäs-	*gabbäs-	*gäbabbäs-	*gbäsäbbäs-	"gather, amass"
a-	*agäbbäs-	agabbäs-	*agäbabbäs-	agbäsäbbäs-	
t-	*tägäbbäs-	* tägabbäs-	*tägäbabbäs-	tägbäsäbbäs-	
as-	*asgäbbäs-	*aggabbäs-	*aggäbabbäs-	----------	

Inflectional affixes of verbal stems are mainly agreement elements: the prefixes and the suffixes attached to the verbs to mark agreement of person, number and gender of the subject and objects of a sentence. These inflectional affixes vary with the conjugational forms of the verb. The following are subject and object pronominal affixes that are attached to verbs in the four conjugational patterns:

	Subject				Object
Person	**Perfective**	**Imperfective**	**Gerundive**	**Imperative**	**All**
1s	-k^{w}/-h^{w}	ï-	-e	lï-	-ň
2sm	-k/-h	tï-	-äh		-h
2sf	-š	tï- -i	-äš	-i	-š
3sm	-ä	yï-	-o	yï-	-w/-t
3sf	-äč	tï-	-a	tï-	-at
1p	-n	ïn(nï)-	-än	ïn(nï)-	-n
2p	-u	tï- -u	-ačïhw	-u	-ačïh^{w}
3p	-ačïh^{w}	yï- -u	-äw	yï- -u	-ačäw

TABLE 4: Pronominal affixes of the verb

As noted earlier the distinction between the imperfective and gerundive functions is marked by the distinctive pronominal affixes in columns 3 and 4 than in their pattern of derivation. On the other hand, the pronominal affixes for the imperfective and the imperative are more or less the same. The two forms are differentiated by their distinct conjugational patterns.

2.4.2.2.1 Derivation of Nominals by Affixation

In addition to the derivational patterns which produce nominal stems, Amharic has a rich system of nominal affixation that derives various forms of nouns and adjectives. Specifically, varieties of subclasses of nominals that include gerunds, instrumentals, and agentives, are formed by attaching affixes to actual or potential stems. Infinitive/gerund forms of nouns are formed by attaching the prefix /*mä-*/ to a stem similar to the imperative form of the verb, as exemplified below.

(14) Infinitive formation

	Stem	**Gerund/Infinitive**	**Gloss**
a)	sbär	mä-sbär	"breaking"
b)	tsäbär	mä-ssäbär	"being broken"
c)	fälläg	mä-fälläg	"searching/wanting"
d)	t-fälläg	mä-f-fälläg	"being wanted"
e)	a-dbälbäl	m-a-dbälbäl	"thickening"
f)	*škärkär	mä-škärkär	"be rolling"

With the exception of (14)c the bases of the gerundive/ infinitive forms are the imperative forms of their respective roots. The deviation of *fälläg* in having the phonemic vowel instead of the epenthetic /ï/ after the penult geminate consonant is common for type B roots.

Similarly, instrumentals, are nouns with associated meaning of "with/at/in which the event of the verb takes place" that are derived from infinitive bases by attaching the suffix /-^{y}*a*/ as in (15).

(15) Instrumental noun formation

	Gerund/Infinitive	**Instrumental**	**Gloss**
a)	mä-sbär	mä-sbär^{y}a	"breaker"
b)	mä-fälläg	mä-fälläg^{y}a	"searching instrument"
c)	m-a-dbälbäl	m-a-dbälbä^{y}a	"thickener"
d)	mä-škärkär	mä-škärkär^{y}a	"roller"

The same process of affixation applies in the formation of Agentive nouns, which are nouns that identify an entity as the doer or, in passive and stative stems, as the 'undergoer' in an event. These nouns are formed by suffixing /-*i*/ to different nominal stems as illustrated in the following examples:

(16) Agentive nominal formation

	Base	**Derived**	**Gloss**
a)	säbar	säbar-i	"breaker"
b)	fällag	fällag-i	"seeker"
c)	tä-fällag	tä-fällag-i	"wanted"
d)	tä-škärkar	tä-škärkar-i	"vehicle/roller"

The bases of Agentive nominals are bound forms such that, although their roots have gone through a derivational pattern they cannot form words without taking a derivational affix.

There are also a number of suffixes like the instrumental and the agentive suffixes that tend to be augments to partially derived nominals. We collectively call them augment affixes and illustrate their use below.

(17) Augment affixes

/-a/
/-e/
/-Vt/ (where "V" stands for vowels; -ät, -at, -et, -ot)
/-Vta/ (-ata, -eta, -ota)

	Derived Noun	**Gloss**
a)	säbär-a	“breaking (act/process of)”
b)	fïs’am-e	“completion”
c)	dïmk’-ät	“magnificence”
d)	nïk’k’ïs-at	“tattoo”
e)	sïmm-et	“feeling, emotion”
f)	fïlag-ot	“wan, search”
g)	gïnb-ata	“construction”
h)	käbär-eta	“respect”
i)	sït’-ota	“gift, giving (act of)”

The stem patterns of the base forms of the examples above are recognizable as nominal patterns. However, most of the particular base forms are not commonly found as independent nominals unless augmented by those affixes. The augment affixes form abstract nouns of actions, processes, states of being, attributes, etc. with various patterns of stems.

2.4.2.2.2 Other Nominal Affixes

In addition to those affixes which are attached to stems of specific patterns, there are several other suffixes which derive nouns and adjectives by being attached to other noun or adjective bases irrespective of their stem patterns. This kind of derivation can be called secondary, because it is based on actual words than finalizing a root-and-pattern formation process. The affixes include /-nnet/, /-nna/, /- äňa/, /-am/, /-amma/, and /-awi/. To illustrate the use of each affix first let us consider /-nnet/.

/-**nnet/:** derives abstract nouns with the general meaning of "a state of being X" (where X is the meaning of the base).

	Base	Gloss	Derived	Gloss
a)	lïj	child	lïjï-nnät	“childhood”
b)	and	one/unit	andï-nnät	“unity”
c)	näs'a	free	näs'a-nnät	“freedom”
d)	jägna	hero/brave	jägnï-nnät	“heroism/ bravery”
e)	abal	member	abalï-nnät	“membership”

The base nominals are independent before affixing /-nnet/. However, those ending with vowel may have to drop their final vowel as in d) above. Whereas the dropping of final vowel seems to be optional it also indicates strength of lexicalization of the formation.

/**-nna/:** also derives abstract nouns from a different set of adjectives with the general meaning of "a state of being X". This suffix is attached to tri-radical bases and requires the adjustment of the stem to $C_1C_2(C_2)C_3$-.

	Base	Gloss	Derived	Gloss
a)	k'ïddus	saint	k'ïddïsïnna	“sanctity”
b)	gäbäre	farmer	gïbrïnna	“agriculture”
c)	sänäf	lazy	sïnfïnna	“laziness”
d)	ïrguz	pregnant	ïrgïzïnna	“pregnancy”
e)	šïmagïlle	elder	šïmgïlïnna	“elderliness/arbitration”

/**-äňa/:** is the suffix which derives ordinal numbers from cardinal numbers. It also derives nominal , which have the characteristics of both nouns and adjectives. The derived word acquires the general meaning of "associated with X".

	Base	Gloss	Derived	Gloss
a)	and	one	andäňa	“first”
b)	wänjel	crime	wänjeläňa	“criminal”
c)	hail	power	hailäňa	“powerful”
d)	ïddïl	luck	ïddïläňa	“lucky”
e)	adäga	danger	adägäňa	“dangerous”

/-am/: derives adjectives which give mostly derogatory connotation of: "dominated by the substance or property of X"

	Base	Gloss	Derived	Gloss
a)	zïmb	fly	zïmbam	“fly infested”
b)	bïrd	chill	bïrdam	“chilly”
c)	wïšät	lie	wïšätam	“liar”
d)	hod	stomach	hodam	“glutton”
e)	nïft'	bugger	nïft'am	“one with bugger”

/-amma/: derives adjectives interpretable as: "tends to have more of X"

	Base	Gloss	Derived	Gloss
a)	dïngaj	rock	dïngajamma	“rocky”
b)	tärara	mountain	täraramma	“mountainous”
c)	ašäwa	sand	ašäwamma	“sandy”
d)	s'ähaj	sun	s'ähajamma	“sunny”
e)	damäna	cloud	damänamma	“cloudy”

/-awi/: derives adjectives with the meaning: "belonging to X"

	Base	Gloss	Derived	Gloss
a)	mïsrak'	East	mïsrak'awi	“Eastern”
b)	amerika	America	amerikawi	“American”
c)	sälam	peace	sälamawi	“peaceful”
d)	wätadder	soldier	wätadderawi	“military”
e)	tïmhïrt	education	tïmhïrtawi	“educational”

To summarize, there appear to be two levels of affixation for nominals: first, as they complete their formation with the derivational patterns, and second, after they are formed as independent stems. The second stage also applies to non-root derived nominals as well.

2.4.2.2.3 Inflection of Nominals

Unlike the verbs where for the most part inflection takes place by modifying the root along the inflectional patterns, the inflection of nominals is performed only by affixation. Nouns inflect to mark number, definiteness and possession. The most productive plural marker in Amharic is the suffix -*očč*, and it applies to almost every countable noun, as in (18).

(18) Plural formation

	Basic	Plural	Gloss
a)	säw	säw-očč	"person"
b)	bet	bet-očč	"house"
c)	lïj	lïj-očč	"child"
d)	tämari	tamari-očč	"student"

It should be pointed out that there are also other plural marking affixes and patterns which are borrowed from Geez; however, those are limited to the borrowed nouns, and we will not deal with them here.

Possession is morphologically marked by suffixing pronominal possessive markers to the noun in possession. The suffixes vary according to the person, number and gender of the possessor.

(19) Nouns in possession

	Nouns in Possession	Gloss
a)	bet-e	"my house"
b)	bet-ïh	"your house (m)"
c)	bet-ïš	"your house (f)"
d)	bet-u	"his house"
e)	bet-wa	"her house"
f)	bet-ačïn	"our house"
g)	bet-ačïh^{w}	"your house (pl)"
h)	bet-ačäw	"their house"

The possessive markers for the third persons singular masculine and feminine (19)e and (19)f are also definite markers. The two examples can be rendered in the appropriate context as "the house" with gender variation. Gender here is attitudinal than grammatical.

Whereas the derivation of verbs appear to assign more or less specific syntactic and semantic properties to the derived forms, the nominals derived in a certain pattern do not seem to be associated with distinct syntactic or semantic properties.

2.4.2.3 Compounding

Word formation in Amharic is not restricted to root-and-pattern and affixation: There is a process of compounding which derives mostly nouns out of frozen nominal phrases of modifier-modified relation. There are also verbs formed by compounding a lexical (category-less) base with a functional verb. We describe this process briefly here.

2.4.2.3.1 Compound Nouns

Compound nouns are basically genitive noun phrases which have in time dropped the genitive particle. For example, all the examples of *bet* "house" compounds below were originally formed with the genitive *yä-* to mean "a place of"**.**

(20) Compound nouns

	Modifier	**Gloss**	**Compund**	**Gloss**
a)	hakim	doctor	hakim bet	"health center/hospital"
b)	tïmhïrt	lesson/education	tïmhïrt bet	"school"
c)	mïgïb	food	mïgïb bet	"restaurant"
d)	fïrd	justice/judgment	fïrd bet	"court"

The phrasal counterparts of those compounds would be *yä-hakim bet, yä-tïmhïrt bet, yä-mïgïb bet, yä-fïrd bet*. However, the phrasal forms cannot be formal names of those places. Rather they will denote a house the purpose or the owner of which is described by the words to which *jä-* is prefixed**.**

2.4.2.3.2 Compound Verbs

There are some stems which are not derived into a specific class of words, and remain to be potential until they are combined with verbs of *alä* literally "say" and *adärrägä* "do/make". The potential stems follow patterns of $C_1C_2C_2C_3C_3$ or $C_1äC_2äC_3C_3$ in tri-radical roots and they can be derived from productive roots or from roots of limited productivity.

(21) Compound verbs

	Bound stem	**Gloss**	**Compound**	**Gloss**
a)	k'äss	slow	k'äss alä/ adärrägä	"be/make slow"
b)	zïmm	quite	zïmm alä	"became quite"
c)	käfätt	open	käfätt alä/ adärrägä	"it opened/he opened (softly)"
d)	kïffïtt	open	kïffïtt alä/ adärrägä	"it opened/he opened (at once)"
e)	däss	happy	däss alä	"became happy"
f)	dïkkïmm	tire	dïkkïmm alä/ adärrägä	"be/make tired (intensely)"
g)	däkämm	tire	däkämm alä/ adärrägä	"be/make tired (slightly)"

The bound stems which receive grammatical support from *alä* and *adärrägä* to become full-fledged verbs, encode the meanings of the roots into some sound symbolic expression or in Doke's (1935) terms: "A vivid representation of an idea in sound".

2.4.2.4 Reduplication

Obvious process of reduplication is observed with common adjectives of size, color, quantity/count, and quality. Such adjectives can undergo total reduplication mainly to form adjectives of class. Some reduplicated adjectives result in adverbials or adjectives of slightly different meanings.

(22) Total reduplication

	Base	Gloss	Reduplicated	Gloss
a)	and	one	and and	"some"
b)	tïnnïš	small/little	tïnnïš tïnnïš	"a little"
c)	tïllïk'	big/large	tïllïk' tïllïk'	"big ones"
d)	addis	new	addis addis	"new ones"
e)	k'äyy	red	k'äyy k'äyy	"red ones"

The tendency of contraction of the totally reduplicated forms has created partially reduplicated equivalents with the exception of number adjectives. The following are partially reduplicated forms of the above adjectives.

(23) Partial reduplication

	Base	Gloss	Reduplicated	Gloss
a)	tïnnïš	small/little	tïnïnnïš	"a little"
b)	tïllïk'	big/large	tïlïllïk'	"big ones"
c)	addis	new	adaddis	"new ones"
d)	k'äyy	red	k'äyayy	"red ones"

Conclusions

Besides being a prominent Semitic language with the second largest number of speakers in its sub-family, Amharic has various features that make it very interesting for linguistic investigation. In this chapter we have attempted to document several major sociolinguistic and structural features of Amharic. Sociolinguistically, we have shown that Amharic has the profile that made it a vigorous official language of the country. In discussing its evolution we have shown that its spread over the centuries has brought it, among other things, in contact with other Ethiopian languages of the Afro-Asiatic family which may have some structural influence on Amharic. It should be emphasized here, in particular, that the preservation of some of the significant Semitic properties and the innovation of some new ones from the close interaction

with its distant relatives of the other Afro-Asiatic languages of Ethiopia distinguish Amharic as the foremost representative of the Afro-Asiatic family. We assume that sound symbolism is one such a feature that Amharic may have developed in its evolution within the Ethiopian language area. The brief structural discussion has highlighted the sound system and morphology the language. The grammatical features outlined are believed to provide some important information for the appreciation of the phenomenon of sound symbolism in the language which will be discussed in subsequent chapters.

CHAPTER 3:

REVIEW OF LITERATURE

3.1 Introduction

The idea that the meaning of a word may be bound by its form is as old as the history of linguistic inquiry. Although the naturalist position in the form-meaning-relation debate did not take sway to dictate the course of linguistics against the conventionalist position, it has always been there now and then attracting the attention of linguists to investigate areas of systematic relation between sound and meaning in vocabularies of languages (see Magnus 2001 for a brief survey of research in phono-semantics).

The major directions and theoretical developments in the effort of discovering systematic relation between sound and meaning can be generalized as follows: ideophonics, sub-morphemics, and phonosemantics. This section briefly discusses those directions and theoretical developments with representative works.

3.2 Ideophonics

The linguistic expressions that suggest bearing direct evidence for a natural relation between linguistic sounds and meaning are those that imitate the sounds of the natural phenomena they represent. As more and more expressions were found not to fit into the onomatopoeic or mimetic category by the way in which their meaning (imagery or sensation) is related to their linguistic sounds, such expressions were loosely referred to as expressives. When the studies on many of the unwritten languages of the world discovered the abundance of such expressions the term ideophone was adopted to recognize them as special category. Although the important characteristic features of ideophones are their iconicity and sound-symbolism (Voeltz & Kilian-Hatz 2001), the view that they are phonologically and grammatically special and that they are

prevalent only in some languages hindered the integration of findings with the broader problem of systematic sound-meaning correlation. One such study conducted in this view is Leslau's (1961) 'Echo-words in Ethiopic', which is summarized toward the end of this chapter.

3.3 Sub-morphemics

Even though the linguists' intuitions about systematic relation between sound and meaning were very well-articulated at times, the body of literature on the subject was largely speculative and anecdotal that the findings could not be built upon to advance a scientific knowledge of the phenomenon. As duly acknowledged in Magnus (2001), it was Leonard Bloomfield (1909, 1910) who added scientific rigor to the conversation by testing his hypothesis on a comprehensive data to demonstrate the sound-meaning correlation in the sets of words connected by (non-derivational) secondary ablaut (vowel gradation) in Germanic languages. Bloomfield's conclusion was that the semasiological differentiation in the ablaut variations may have developed along inherent old Germanic sense for stem vowel pitch driven by the imitative as well as connotational effects of the vowels in the scale:

> A high tone implies not only shrillness but also fineness, sharpness, keenness; a low tone not only rumbling noise, but also bluntness, dullness, clumsiness; a full open sound like *ā* not only loudness, but largeness, openness, fullness. Nor must the subjective importance of the various mouth positions that create the different vowel sounds be forgotten: the narrow contraction of *ī*, the wide opening of *ā*, the back-in-the-mouth tongue position of *ū* are as important as the effect of these vowels on the ear of the hearer. …the development in question is a very common and characteristic one for Germanic wherever a number of words standing to each other in a relation of secondary ablaut have become differentiated as to meaning. (1909: 250)

His interpretation of the vowel pitches were consistent with the ones before him and were also carried through many of the subsequent studies in the early 20th century which were mainly aimed at finding the correlations between vowels and the concepts of size, quantity, force, and

the like, to determine whether there is a universal sound symbolic substrate underlying all languages. The latter investigations were mostly reports of experiments using invented words and various comparative surveys between languages to test the hypothesis of what came to be known as magnitude sound symbolism (see Nuckolls 1999 for the survey of the major research on different forms of sound symbolism). The significance of Bloomfield's analysis, more than the description of meanings of some vowels in some lexical items, is that it asserts the role of sound symbolism in the structure of the lexicon.

Bolinger (1950) expanded the horizon of systematic sound-meaning correlation in the lexicon beyond the vowels and special expressions. His was more of a challenge to the all-or-none way of analyzing morphemes by absolute opposition, a method adopted from the field of phonology in the heydays of the latter. He argued that by comparing words for similarities and differences with focus on formal and semantic consistency one can identify even smaller meaningful units of English which otherwise could be overlooked. Emphasizing the vastness of the rime and assonance patterning in the English vocabulary, he demonstrated the possibility of analyzing the consistently recurring component sub-words as morphemes by the criteria set in the morphemics tradition. In contrast with the traditional sense of morpheme he distinguishes those morphemes as affective and labels them as phonaesthemes.[15]

According to Bolinger, phonesthemic analysis may determine either the assonance or the rime part of a word to be a consistently recurring form-meaning composite where the other component may not be productive enough and/or have so little phonetic and semantic consistency to be considered a morpheme. Those components are considered as sub-morpheme differentials. When such forms do not match any phonetic-semantic pattern with other

[15] Bolinger acknowledges that the term was first used by J. R. Firth (1930) and later defined as "a phoneme or cluster of phonemes shared by a group of words which also have in common some element of meaning or function, though the words may be etymologically unrelated" by Householder (1946).

morphemes or phonesthemes they are assumed to have no systematic meaning to contribute other than to complete the word, and they are put aside as residues. Bolinger's perspective opened an avenue for the study of sound symbolism as a sub-morphemic level of sound-meaning association.

Marchand (1969) includes a section on sound symbolism to his famous work on English word formation in which he describes the symbolic values of the phonemes in the English vocabulary. He points out among other things that contrast in the symbolic values of vowels can lead to the formation of words based on ablaut variation such as *tip* and *tap*. He follows Bolinger (1950) in analyzing monosyllabic words into assonance and rime to explain that their formation is based on the symbolic value of the components.

The analysis of monosyllabic words into sound-symbolic components of rime and assonance continued in the works of Rhodes and Lawler (1981). However, they reject the concept of phonestheme as an ad hoc theoretical notion while maintaining that the semantics of the monosyllables derives from the assonance-rime composition of the parts, which they also affirm are morphemes, but with internal structure of modifier and head where the modifier serves a classifier or adverbial/adjectival function.

In what may count as the first comprehensive study on the root-internal structure of a single language other than English, McCune (1984) analyzed the Indonesian roots into pairs of sound-symbolic units categorized by their positions in the root: left hand side (LH) and right hand side (RH) components. Unlike Bolinger (1950) and Rhodes and Lawler (1981) McCune considers the component units as sub-morphems rather than morphemes. He identifies eight semantic domains and fourteen sub-groups to describe the meanings of the sub-morphemic components. He applies Lakoff and Johnson's (1980) theory of metaphor and Levi's (1978) concept of predicate

recovery in compounds to explain the semantic extensions that result from the combination of the component sub-morphemes.

Bottineau's (2008) assumes that the real nature of the question in the controversy over lexical sub-morphemics lies in defining what a word is. He suggests that the antagonistic views underlying the controversy over sound-meaning relation in human language can be reconciled by adopting a model of speaking along the enactive approach in which the units of language are recognized as vocal sub-actions with specific cognitive contribution of their part to the general orchestration of the sense-making process. Accordingly, he puts forward a hypothesis that in English the word is not always the smallest relevant vocal sub-action to be singled out in the monitoring of the distributed sense-making process; that submorphemic markers constitute hypo-sub-actions whose specific orienting effect can be modeled. He claims that it is reasonable to consider sub-morphemes, particularly in English, as lexical-semantic classifiers. He also suggests a diachronic motivation involving onomatopoeia and then synesthesia may be cautiously hypothesized even though the connections might be far too distant to be traceable, and they do not explain why submorphology remains active in the current lexicon.

3.4 Phonosemantics

Magnus (2001), brought forward the strongest of claims yet in the scientific endeavor to explore the phenomenon of sound symbolism--'phonosemantics', in her own terminology. Her Phonosemantic Hypothesis (given in (1) above repeated here for convenience as (24)) asserts that:

(24) The Phonosemantic Hypothesis

> In every language of the world, every word containing a given phoneme has some specific element of meaning which is lacking in words not containing that

> phoneme. In this sense, we can say that every phoneme is meaning-bearing. The meaning that the phoneme bears is rooted in its articulation. (p. 4)

Magnus (2001) tested her hypothesis by examining 3485 monosyllabic English words taken from Houghton Mifflin's *American Heritage Dictionary.* She defines various tentative natural[16] semantic classes over all the words as she groups the words into the 24 individual phonemes. Once she observes phonosemantic associations in the groupings she further subdivided the tentative semantic classes to determine from each class the semantic properties that could be attributed to the presence and position of particular phonemes. The semantic properties abstracted in this way for each phoneme were assumed to constitute the iconic meaning of that phoneme. She claims to have made the first attempt to provide a semantic profile *of individual phonemes* in a systematic way over a large range of words. Her description of the semantic profile of the phonemes includes the preferred semantic domains for each phoneme, the percentages of words containing that phoneme that can be characterized by those semantic domains, and the semantic effect of phoneme position. She demonstrated that 97% of the words she examined exhibited such phonosemantic associations. The 3% exceptions were found to be words with concrete reference. She maintains that generally referential meaning is less susceptible for iconic effects; concrete reference tends to be even more resistant. She has also validated her observation with speakers' intuition by conducting experiment that allows speakers to define and judge the meanings of some invented words and to invent words for some made up definitions.

The current study is partly an attempt to test Magnus' (2001) hypothesis on Amharic by using similar methodology.

[16] See Magnus (2001) for the characterization of what constitutes a natural set and the criteria she used to determine semantic classes as natural sets.

3.5 On Semitic languages

With regard to Semitic languages in general, it has been long observed in languages like Hebrew and Arabic that tri-consonantal roots sharing two radicals in sequence tend to share some meaning as well. That observation coupled with the fact that bi-consonantal roots had a significant number in the prehistoric stage of Semitic languages (Hurwitz 1915, Kuryłowicz 1973, Moscati 1964, Zaborski 1991) engendered the view that the dominant tri-consonantal root may be the result of historical extension of the bi-consonantal etymon as espoused recently by Bohas (2006) in his elaborate theory of "roots, etymons, and matrices".

Bohas (2006) advances his version of bi-consonantalism beyond the historical primacy of the bi-consonantal roots to claim particularly in Arabic and by extension in other Semitic languages that all roots can be reduced to unordered binary sets of phonemes called etymons plus some augments. The etymons themselves are reducible into simple phonetic/phonological features that are composed into pairs and linked to some semantic nuclei on the feature matrix of the language. It is the pair of phonetic features and the associated semantic nucleus that develops into a unique etymon with additional feature specifications. Roots of two or more consonants share some basic meaning as a common heritage of their form and meaning in the etymon. The roots develop from etymons extended by various means such as: spreading of the last consonant or incrementation by a sonorant, and including at least one vowel, and thereby expanding the semantic nucleus.

Bohas (2006) makes reference to an experiment by A. Razouk (1999 – 2000) to reject the concept of the root as a mental reality, showing that a significant number of subjects could not readily determine the roots of some selected words. He also argues that the concept of the root cannot be an adequate grammatical tool, because it fails to account for the similarity of meaning

between words that share a subset of their consonants. He suggests that the lexicon of Semitic languages can be organized better by the etymon to capture the inherent sound-meaning relations.

Bar-Lev (2005/6) claims that single initial consonants have separate meanings of their own in Semitic languages and describes the meanings of what he calls key-consonants of Arabic as initial single-segment submorphemes. He built his theory on the insight he drew from the early Hebrew grammarians' attempt to list the meanings of individual consonants. He places his theory between Bolinger's sub-morphemics and Magnus' Phonosemantics: the initial consonant as a meaningful single-segment qualifies as a phonestheme (or sub-morpheme) or as a phonosemantic element. However, according to key-consonant theory the remaining part of the root or word is considered as residual, which is responsible for all the semantic differences but without any patterning of meaning. Bar-Lev's approach was primarily driven by a practical purpose of finding a more efficient tool for the teaching of vocabulary in languages like Hebrew and Arabic as foreign languages. He admits that in the absence of a theory of lexical semantics his theoretical claims about the structure of the lexicon of Semitic languages can only be validated by the outcomes of L2 learning:

> …we are far from being able to validate very many interesting claims about lexical semantics, now or in the near future— largely because of the absence of an available set of semantic features, analogous to the phonological features used in phonological theory (51).

In spite of the apparent patterning that is highlighted in **TABLE 1** & **TABLE 2**, the issue of sub-morphemic sound-meaning correspondence between different roots received little attention in the literature of Amharic grammar. Very few serious attempts have been made to study the phenomenon of systematic sound-meaning correspondence in the Amharic lexicon. In his study of bi-consonantal reduplication (BCR) in Amharic, Unseth (2002) made three observations about

the sound symbolic nature of the semantics of BCR roots. First, he notes that the semantics of BCR-derived stems mostly conform to the iconism of reduplication as stated by Sapir (1921); BCR-derived stems are associated with concepts such as distribution, plurality, repetition, customary activity, increase in size, added intensity, and continuance. Second, he notes that some semantic categories are more frequently reflected by BCR forms and he lists the semantic categories and the corresponding roots. Finally, he conjectures a pattern of link between the consonants of some BCR roots and certain categories of meaning. He particularly points out some classes of roots as compelling evidence for sound symbolism such as those that denote "descending motion (fast)" all containing initial voiced sibilant, voiced velar stop, and a sonorant; and roots that denote "mouth acts (chew, bite)" all containing initial /l/. As interesting as this last point is the author admits that the findings are inconclusive and the presentation is intended to inspire discussion, debate and further research in the area. The current proposed research may be considered partly as a response to that call.

The only research that is cited in the sound symbolism literature and somehow touches on the sound symbolic properties of a small section of the Amharic lexicon is Leslau's (1961) description of the characteristics of the so-called echo-words. His study belongs to the tradition of the study of ideophones, which confines the phonosemantic phenomena to a special category of expressions that are believed to be prevalent in some languages, which among other unique properties are characterized by iconicity and sound-symbolism (Voeltz & Kilian-Hatz 2001). The article compares the echo-words (compounds in which a word somehow repeats its form with a different initial consonant(s) as in 'helter-skelter') in three Ethiopian Semitic languages viz., Amharic, Tigrinya, and Tigre. It discusses the patterns of form and meaning of the

component units and of the echo-complex. The following are some of the examples of the echo-words described:

(25) Sample echo-words in Amharic (Leslau 1961)

a)	arti burti	"useless, nonsense"
b)	tïrki mïrki	"motely of useless elements"
c)	asäs gäsäs	"rubbish, trash"
d)	ïnto fänto	"insignificant and useless items"
e)	wït't'ïr gut't'ïr	"be budging, unattractive"
f)	fändäss gändäss	"fall down clumsily, lie down to sleep or sit in a careless manner"
g)	wälämm zälämm	"act clumsily, awkwardly"
h)	sälala mälala	"disproportioned, uneven"
i)	abat'a gobat'a	"uneven, crooked, bent"

The salient properties indicated are that the components share considerable phonological similarity and that the echo-complex serves for the reinforcement of meaning of each of the components for the repetition of the action expressed by each individual component or for the generalization of the meaning. The expression of meanings such as "trivial", "useless", "nonsense", "rubbish" and acts and qualifications of uncomplimentary nature are indicated as being more frequent in the echo-words.

The reinforcement of meaning of the components of the compounds could be attributed to the sharing of the same phoneme sequences, which could lead further to the investigation of those sub-lexical form-meaning composites for possible sound-symbolic role in the formation of the expressions. It is useful to note here that Bolinger (1950) mentions the collocation of phonemes in compounds and coordinates with riming or alliterating components as evidence for building the patterns that establish phonesthemes. Also the characterization of the meanings of the expressions as acts and qualifications of uncomplimentary nature, even while some of the components are not meaningful independently, could be attributed to a symbolism of

reduplication, namely attenuation, on the part of the components as Sapir (1921) generalized. However, there is no implicit or explicit generalization in Leslau's study about the possibility of sound symbolism in the formation and interpretation of the echo-words.

Another study that is indirectly relatable to the issue of systematic sound-meaning correlation in Amharic is Yimam (1999). This study deals with semantic and structural relation between roots. His general claim is that Amharic verb roots have uniformly three radicals in their underlying representations and the variation in the number of radicals in surface forms is a result of extension and/or reduction of one or more of the three radicals. The topic in Yimam's study that is particularly relevant to the current study is that which deals with the formation of quadri-radical roots out of tri-radials. He argues that quadri-radicals of the pattern C_1-C_2-C_3-C_3 are derived by internal extension, namely, reduplication of C_3 adding a durative sense to the tri-radical base as in *färrät'ä* "to burst" > *färät't'ät'ä* "to run away scared". However, in the case of quadri-radicals of the pattern C_1-C_2-C_3-C_4 he argues that the C_2 is a consonant with a predictable [+continuant] feature which is added as an external extension in a manner of epenthetic insertion. All the other problematic aspects of Yimam's (1999) assertion aside, what is remarkable is the lack of any comment about the meaning relationship between those quadri-radicals and their supposed tri-radical bases as many of the pairs surface in parallel as in *qäddädä* "tear (soft sheet)" vs *qäräddädä* "tear (harder sheet)", *gäbbät'ä* "carve" vs *gäläbbät'ä* "turn over/ inside out/ upside down". Looking at the phonetic and semantic relatedness between words of various root patterns, one may easily accept the hypothesis of root extension which incrementally builds roots of larger number of consonants from smaller ones. However, this analysis should not have been limited to the formation of quadri-radicals and also the semantic/functional outcome of the phonetic increment should have been investigated.

CHAPTER 4:

ANALYSIS OF THE SUB-MORPHEMIC PHENOMENA

4.1 Introduction

In this chapter we will look at the organization and analysis of the data in terms of the theoretical frame work adopted in Chapter 2. The observed sub-morphemic sound-meaning correspondences between multi-consonantal roots will be discussed first by representative matching pairs of consonants and then by single consonants.

4.2 Organization of the data

4.2.1 Determining the root

The lexical units initially collected from the dictionary were rather entries that in lexicological and grammatical tradition are accepted as citation forms to represent families of semantically and grammatically related words. With the exclusion of phrasal or idiomatic forms and all other elements of the vocabulary that do not conform to root-and-pattern morphology, all the major entries of the dictionary were collected. Extracting the consonants of those entries crudely amounts to determining the roots in the sense of the traditional root-and-pattern morphology. However, since the dictionary entries are organized basically according to the convenience of presenting the contextual aspects of meaning in the definitions, many grammatically related forms are represented as separate entries including those which carry recognizable affixes.

Organizing the raw dictionary entries into a database of roots for the present study required more than merging those grammatically relatable entries. After merging those entries there were still numerous other entries which exhibit formal and to some extent semantic relatedness for which there is no known formalism to represent. The observed patterns of relatedness are: 1)

consonantal similarity with vocalic variation without morphological connection such as *t'älla* "distaste, dislike, hate" and *t'alä* "drop, abandon", and 2) consonantal similarity with variation in patterns of duplication that are not recognized as morphological such as *t'älla* "distaste, dislike, hate", *t'älläla* "suspend, cast", and -*t'älät't'älä* "hang, dangle". Since the purpose of the study is to examine the consonantal sound-meaning relationship in the lexicon beyond morphology, the best way to organize the dictionary entries was to arrange them first by shared basic consonants and then list the different patterns of variation as sub-entries. As a result some 2361 unique sequences of 1-4 consonants emerged as consonantal bases of the dictionary entries and sub-entries.

4.2.2 Relating the roots by shared forms and context-neutral meanings

The next step was to determine the semantics of the abstracted consonantal bases many of which are not major entries to draw their definitions from the dictionary. A number of those consonantal bases incorporated in our database cannot even be considered as roots in the traditional sense, because there are no known morphological patterns to systematically connect them to all their sub-entries. Based on the position taken on root analysis outlined in the theoretical framework section of Chapter 1, the unique sequences of consonants are assumed to be etymons that subsume varieties of roots that are morphologically connected to the actual words. In most cases there is no conventional definition for the etymons, since they are decontextualized abstract entities. Whereas the logical way of representing the semantics of an etymon is to characterize it hierarchically by the shared semantic properties of its sub-entries and associated derived forms, there is no standard theory of abstracting the context-free semantics of lexical items. The following steps were adopted to generalize some feature-like semantic properties for roots and etymons from the given definitions of their derived actual forms.

a) relating the various definitions of the same form by finding common grounds beyond reference,
b) stating and restating the meanings of forms in generic terms in a manner that can be related to the other members of the group as well until some fairly common semantic properties emerge,
c) representing the semantic properties of the forms at all levels in terms of expressions that can be interpreted as simple concepts

We assume that no single word or, for that matter, even a single sense of a word is completely defined in a dictionary; i.e., there is always more to say by way of specifying or generalizing its meaning. Therefore, wherever the definitions of forms in the dictionary are not stated in a manner that reflect the essential properties of those forms to connect them to other forms, the researcher relied on his intuition as a native speaker of the language to tease out those essential properties from the given definitions or include the missing senses of the forms. It should be noted here that despite all the effort to maximally specify the semantics of the forms at the bottom of the hierarchy to come up with a fairly representative bottom-up semantic characterization, there will be a considerable number of sub-entries that do not fit into the scheme due to fading of semantic transparency from a history of use or down right difference in origin that cannot be recovered without a thorough etymological study.

4.2.3 Analytical procedure

Once the dictionary entries are collapsed into unique sequences of consonants referred to as etymons and the semantics of each etymon is characterized as contextually neutral common meanings of the group of entries under it, the multi-consonantal entries were compared cross-categorically for matches in sharing sets of consonants along analogous radical positions as well as some elements of meaning. First quadri-consonantal etymons were compared with tri-consonantal etymons with the aim of identifying semantic correspondences at the highest level of

multi-consonantal matches. The anticipated possible phonetic and semantic correspondences were as follows:

Quadri-consonantal etymon:		**<1, 2, 3, 4>**	**Match with Quadr-**	**Match with Tri-**
Tri-consonantal etymons:	a)	<1, 2, 3 >	Not significant	N/A
	b)	<1, 2, 3>	Not significant	N/A
	c)	<1, 2, 3>	Not significant	N/A
	d)	< 1, 2, 3>	Not significant	N/A

However, the comparison did not result in significant correspondence of the tri-consonantal etymons within the quadri-consonantal ones at any of the possible positions to lead to an investigation of possible phono-semantic association or historical formation of quadri-consonantal etymons from tri-consonantal ones as often suggested by linguists (Hurwitz 1913, Kuryłowicz 1973, Yimam 1999).

Similar comparisons were made between all the multi-consonantal etymons; and bi-consonantal etymons were found to correspond with the two other types of etymons in the following fashion:

Quadri-consonantal etymon:		**<1, 2, 3, 4>**	**Overlap with Quadr-**	**Match with Tri-**
Tri-consonantal etymons:	a)	<1, 2, 3 >	Not significant	N/A
	b)	<1, 2, 3>	Not significant	N/A
	c)	<1, 2, 3>	Not significant	N/A
	d)	< 1, 2, 3>	Not significant	N/A
Bi-consonantal etymons:	a)	<1, 2 >	Significant	Significant
	b)	< 1, 2 >	Not significant	Significant
	c)	< 1, 2>	Significant	N/A

Tri- and quadri-consonantal etymons whose initial and final pairs of consonants matched the bi-consonantal etymons exhibited semantic similarity suggesting phono-semantic association at the

level of the compared pairs of consonants. A higher degree of phono-semantic association was observed on the initial pair matches. The tri- and quadri-consonantal etymons were then grouped into two by initial pair and final pair matches along with corresponding bi-consonantal roots. The pairs of consonants with wider distribution among the tri- and quadri-consonantal etymons and with a higher degree of semantic bond across the roots were extracted to examine their possible phonaesthemic development. The semantics of the etymons were further analyzed so as to enable us to abstract the unifying meanings of the phonaesthemes that bind them into phono-semantic sets.

The matching pairs of consonants occurred at the edges of the etymons classifying them in ranges of 1-40 by initial or left edge matches, and 1-29 by finial or right edge matches. All the tri- and quadri-consonantal etymons that share the pairs of consonants at an edge at least in a group of 5 were checked for semantic similarity, and those which shared the pairs in groups of more than 10 were found to have observable semantic similarity. Those groups of etymons that matched 46 initial and 70 final pairs were then selected as preliminary data set for closer examination of semantic bond that can be attributed to the sharing of the pairs of consonants. Later the final data set of pairs of consonants was determined based on the sample consonants, which in turn were selected based on the observation from the preliminary data of the consonant pairs.

Most of the selected pairs have shown strong phonaesthemic tendency that any native speaker may be able to predict the prototypical semantics of words containing those elements.

To select a representative sample of consonants for the investigation of possible phoneme level semantic associations the following steps were pursued: 1) determination of the frequency of occurrence of the consonants, overall and relative to the categories of the etymons and to the

preliminary sample pairs, 2) determination of the frequency of occurrence of the consonants in relative radical positions within all the categories of the etymons, and 3) projection of the sample consonants from the preliminary sample pairs: the consonants were envisaged to be such that when permuted by two they should produce pairs that are within range of the preliminary sample pairs in number and well matched in identity. Following those steps 11 consonants of higher frequency and wider distribution of occurrence were selected.

After the selection of the sample consonants the final sample pairs were determined. The permutation of the sample consonants produced 110 unique pairs. Out of those pairs 10 were found to be phonotactically incompatible containing homorganic consonants such as /rn/, /lr/, /gk'/, etc. Of the 100 pairs 39 fell outside the range of the preliminary sample pairs matching fewer than 11 etymons each. The remaining 61 pairs matched the preliminary sample pairs representing 30.95% of the combined tri- and quadri-consonantal etymons by the left edge matches and 41.32 % of the same set of etymons by the right edge matches. It is important to emphasize the fact that the sample etymons represented by the pairs and single sub-morphemic consonants cover over a third of the Amharic open class vocabulary.

Among the other facts to be noted here are that the semantics of the lexical items were further decontextualized to allow abstraction at the different levels of the hierarchy of organization. Also some rather high frequency consonants such as /ʔ, w, t, k, z/ were not included in the sample, because of their restricted distribution in radical positions. However, the numerous etymons containing those consonants in combination with the sample consonants were additionally examined in determining the semantics of the actual sample pairs and single consonants. Also a number of pairs that fell just short of 11 matching etymons to be part of the sample have been considered in situations where there are fewer etymons in the sample groups

for some consonants. For example, in determining the semantics of /_dr/ as "ground, hold on to ground" the meanings of *ʔdr* and *wdr* related to "ground, land" had to be considered even though roots with /ʔ/ and /w/ are not part of the sample data.

R_2R_3 positions of quadri-consonantal etymons have not been included in the examination of the phonaestemes due to the disproportionate occupation of the R_2 position by three sonorants /l, r, and n/: the three consonants occur 75% of the time in that position.

4.3 The sub-morphemic/ phonaesthemic elements and their semantic properties

This section offers analysis of the semantic properties of some sample pairs of consonants as they emerged from the convergence in meaning of the etymons that share those pairs of consonants in the same positions. The presentation is divided in two sub-sections. The first deals with the pairs of consonants that occur at initial positions of the etymons and the second sub-section deals with the pairs of consonants that occur at the final positions of the etymons. In both sub-sections the prevalence of the characteristic semantics of the pairs of consonants are highlighted by elaborating the dictionary definitions of some of the common derived forms of the less exotic[17] etymons.

To facilitate the reader's understanding of the analysis of the data and to present it as transparently as possible the description of the sub-morphemic elements and their semantic properties are presented as follows: first, the sample sub-morphemic elements are given together with a short description of the common semantic properties of the etymons they classify. Then the counts of the matching etymons are specified for each sub-morphemic element followed by

[17] Some of the roots collected based on the dictionary do not have extant words that are in active use currently. Some may have restricted dialectal use.

the list of the actual etymons in the group. After the listing a brief discussion of the meanings of the selected etymons follows.

4.3.1 The initial pairs

In this sub-section eighteen sub-morphemic pairs of consonants found at initial position of the etymons are presented. The pairs are selected in such a way that the eleven sample phonemes can be represented by two pairs as much as the composition of the pairs permits.

Let us now consider the sample sub-morphemic pair one by one in alphabetical order.

(1) Sub-morpheme: /bl_/
Semantic description: "slip, fade, disappear"
Number of etymons: 12
List of etymons: bl, bls, blš, blk', blk't', blt, blz, bld, blg, blt', blt'g, blč'

Looking at the common verb *bälla* "eat", we may not be able to clearly see the "fading, disappearing" sense of the word unless we disentangle our attention trapped in the complex process of eating. The disappearing of the thing being eaten is at focus in the basic meaning of *bälla*. "Going bad or being discolored" in *bälläsä*, *tä-bälaššä*, and *bälläzä* have the central meaning of /bl_/ at their core. The instantaneous appearance and disappearance of light in *bïlïč'č'* and the slippery-like surpassing in *bällät'ä*, and the "bursting forth" in *b^{w}ïllïk' alä* all share the same essential semantic properties comparable to "fading and disappearing" all from /bl_/.

(2) Sub-morpheme: /br_/
Semantic description: "start, open; spread out"
Number of etymons: 19
List of etymons: br, brs, brk', brk's, brk't', brbč', brt, brn, brk, brkt, brz, bry, brd, brdg, brj, brg, brgd, brt', brč'k'

The concept of "opening up" is in the "start light" sense of the verb bärra and in the "let up" sense of the same root. The verb *bärräk'* "lighten, break thunder" has the same senses as *bärra*. The other root *bärrärä* "fly" from the same etymon *br* has the sense of "opening and spreading out", specifically, in the flapping of wings. The verb *bäräk'äsä* "crash through hedges or a pile" has the same senses in the turning of the inside of a mass out. "To be abundant, plentiful" of the root *brkt* has its base on the "spreading" sense of /br_/. "Startle and flee" in *bäräggägä* clearly has the sense of "start and spread".

(3) Sub-morpheme: /db_/
Semantic description: "overlay, pile up, mass"
Number of etymons: 12
List of etymons: db, dbl, dblk', dbs, dbr, dbš, dbk', dbt, dbn, dbk, dbz, dby

The compound verb *d^{w}ïbb alä* "fall from height with thump" and the reduplicated root *däbbäbä* "overhang" are from the same etymon with the sense of "overlay". The verbs *däbbälä* "mix, blend, combine", *däballäk'ä* "merge, mix" and *däbbärä* "stack" have the sense of "mass". Similarly, *däbbätä* "burry, pile up" and *däbbäk'ä* "cover up, hide" are transparent for all the senses of /db_/. The "blur" in *däbäzäzzä* and the "stupor" in *däbbäšä* have the sense of density of mass.

(4) Sub-morpheme: /dn_/
Semantic description: "dense, hard, thick"
Number of etymons: 33
List of etymons: dn, dns, dnsr, dnk', dnk'l, dnk'r, dnk'f, dnb, dnbl, dnbs, dnbr, dnbš, dnbk', dnbz, dnbč', dnt, dnk, dnkl, dnkr, dnws, dnz, dny, dnds, dndr, dnj, dng, dngr, dngt, dngz, dngy, dngt', dnf, dnfk'

The sense of "thickness, hardness, or density" is reflected in many of the etymons rather metaphorically as "stun, sudden momentary loss of consciousness or sensation" as in *dännäk'ä* "astonish, surprise", *dänäbbärä* "bolt, jump, flee", *dänäbbäzä* "stupefy", *dänäzzäzä* "numb, stupor; lose edge", *tä-dänaggärä* "confused", *dänäggät'ä* "startled, surprised", *dänäfäfä* "slow, dimwit". On the other hand, *dänäddän* "thicken", *dänäbbälä* "puffy", *dänäbbäš* "puffy, chubby", *dänäbbäč'ä* "plump" show the core semantics of the sub-morpheme more transparently.

(5) Sub-morpheme: /fr_/
Semantic description: "break, piece, fragment"
Number of etymons: 17
List of etymons: fr, frm, frs, frš, frk', frt, frns, frk, frks, frkt, frz, frd, frj, frg, frgt', frt', frt'm

The sense of "breaking and fragmentation" in *färra* "fear" cannot be expected to be literal. Perhaps, it is the breaking of nerves and the trembling of the body that is embedded in the semantics of the root. Other roots from the same etymon such as *färäffärä* "fragment" and *tä-nfäraffärä* "flail about, flop around" have the sense of the sub-morpheme almost literally. "Breaking and fragmentation" is all in *färräsä* "fall apart, collapse", *färk'k'a* "divide, break up", *tä-fräkärräkä* "crumble". Even the metaphorical sense of "dividing" is felt in *färrädä* as "justice dispensed" for the two sides proportionally.

(6) Sub-morpheme: /fn_/
Semantic description: "open up, release"
Number of etymons: 30
List of etymons: fn, fnr, fnš, fnk', fnk'l, fnt, fntr, fntw, fnčl, fnčr, fnk, fnkr, fnkt, fnz, fnd, fnds, fndr, fndk', fnjr, fng, fngl, fngr, fngt', fnt', fnt's, fnt'r, fnt'k', fnt'z, fnč', fnč'r

The etymons in this group vary in the degree and condition of manifesting the sense of "opening up to release pressure". The pressure in some of the etymons can reach only inner bound of a body as in *fännärä* "protrude", *fännzä* "erect" *a-fänäddärä* "bend and bulge". In some, it is slightly externalized to result some outward motion and impact as in *fänäččälä* "push slightly", *fänäk'k'älä* "pry, dislodge", *fänäggät'ä* "dislocate", *fänäggälä* "over turn" *fänäč'č'ärä* "fall easily". Yet in some others it is high enough to have stronger impact as in *fänädda* "blow up, blast", *fänät't'äk'ä* "sprinkle, scatter", *fänät't'ärä* "spring up, eject"

(7) Sub-morpheme: /gr_/
Semantic description: "cut, break"
Number of etymons: 33
List of etymons: gr, grm, grms, grmd, grmt', grs, grsm, grš, grb, grbt, grbd, grbt', grt, grn, grň, grz, grd, grdm, grds, grdf, grjf, grgm, grgs, grgb, grgd, grgč', grgf, grt', grč', grč'm, grč'f, grf, grft'

The "taming" of *gärra* and "astounding" of *gärrämä* have a sense of "breaking" wild habits to calm the targets. *gärämmädä* "take a big bite", *gärämmät'ä* "take a chunk", *gärässäsä* "uproot, overthrow", *gärräzä* "circumcise", *gäräddäfä* "grind coarsely", *gäräffät'ä* "scratch, lacerate", and *g^{w}ärrädä* "shorten" are plainly words of "breaking" or "cutting", only in different intensity, of different materials, and with different instruments. *garrädä* "curtain" and *garrät'ä* "place barrier" are "breaking" by interception or obstruction. Hugeness, strength, and intensity of force are all parts of the semantic properties of the sub-morpheme /gr_/ inspiring eventual awe as in *gärrämä*.

(8) Sub-morpheme: /gf_/
Semantic description: "charge, push outward"
Number of etymons: 12
List of etymons: gf, gfl, gfr, gft, gftr, gfn, gfy, gft', gft'r, gfč', gfč'l, gfč'r

The outward pressure in expressions of the sub-morpheme /gf_/ is not transitive in most cases. Only the roots *gäffa* "push" and *gäffät'* "confront, hurl at" are noticeably transitive. In the others the pressure results in some form of rise or growth in body of an object as in *tä-gäfäläffälä* "gush forth", *g^{w}äffärä* "grow thick hair", and *g^{w}äfäč'č'älä* "protrude, stick out". *g^{w}äfännänä* "disgusted feeling, shudder" is also an expression of inner pressure that charges.

(9) Sub-morpheme: /k'l_/
Semantic description: "turn, change, convert"
Number of etymons: 26
List of etymons: k'l, k'lm, k'lmd, k'lmt', k'ls, k'lš, k'lb, k'lbs, k'lbš, k'lbt, k'lbt', k'lbč', k'lt, k'lw, k'lwt', k'lz, k'lzm, k'ly, k'ld, k'lj, k'lt', k'lt'm, k'lt'b, k'lt'f, k'lč', k'lf

"Change" as a semantic property may be too broad that it could be associated with any etymon at will. The losing of an original physical and chemical property, or position and the acquisition of new one is very salient in the /k'l_/ etymons. *k'älla* is "turn red" with implied cause of heat as in *k'wälla* "toast". *k'ällämä* is "sully, or change color from contamination". The "telling of conflicting stories" in *k'älammädä* is the change from fact to fiction and back. The "turn and change" sense of *a-k'^{w}älammät'ä* may not be easy to decipher from the metaphorical interpretation of "addressing a name with endearment". One has to get the imagery from "the twisting and turning of the tongue" in the literal base of "wiping the lips as a sign of enjoying a tasty food". *k'älläsä* "bend, bow" and *k'äläbbäsä* "turn back, overturn" seem to be strait forward

for the sense of "turn". *k'ällät'ä* "melt, liquefy" and the "agility" in *k'älät't'äfä* have "converting" and "turning" at the core of their meaning.

(10) Sub-morpheme: /k'r_/
Semantic description: "strip, remove, separate"
Number of etymons: 34
List of etymons: k'r, k'rm, k'rmt, k'rmd, k'rmt', k'rs, k'rsm, k'rš, k'ršm, k'rk's, k'rk'b, k'rk'z, k'rk'f, k'rb, k'rbt, k'rbt', k'rbč', k'rn, k'rnt, k'rnt', k'rň, k'rňt, k'rz, k'rd, k'rt', k'rt'm, k'rt's, k'rt'f, k'rč', k'rč'm, k'rs', k'rf, k'rfd, k'rfč'

Stripping, cutting, or removing a part is in many of the meanings of the etymons above. "Remain, be left behind" in *k'ärrä* or "the separation of the pure from the residue by skimming the former from liquid mixture" in a related root of *k'ärrärä*; "the sharing of pieces of a butchered animal" in *t-k'ärammätä*; the "cutting, sharing, dividing" in *k'^{w}ärräsä*, or "putting aside to be inherited" in *k'ärräsä*; the "tearing of (a hard) sheet" in *k'äräddädä*; "clipping a short piece of a long substance" in *k'ärät't'fä*; the "sculpt, shape" in *k'ärräs'*, or the outright "cutting" meaning of *k'äwrrät'ä* all converge in sharing the sense of stripping or removing a part.

(11) Sub-morpheme: /lm_/
Semantic description: "adaptive change of form or property with suppleness"
Number of etymons: 17
List of etymons: lm, lms, lmš, lmšk', lmk', lmtg, lmn, lmň, lmk, lmz, lmzg, lmd, lmg, lmt', lmč', lmč's, lmč'k'

The verb *lämma* has a dominant meaning of "thrive, be verdant" and in a more modern metaphorical usage it means "develop". The central semantic component is the "adaptability and suitability" of the land for thriving of plants or infrastructures and industries. At first sight, the "paralysis, cripple" meaning of *lämmäsä* doesn't seem to be comparable with any of the

meanings of *lämma*, however, the adaptability in *lämma* and the "suppleness" (of limbs) in *lämmäsä* brings the two forms closer in meaning at a certain level. The "supplicate, appeal" sense of *lämmänä* and the "bend, bow" sense of *lämmät'ä* reflect mental and physical suppleness and adaptability. *lämmädä* with its common meaning of "learn, adopt habit" falls right at the center of the group in signaling the most common semantic property of the group represented by the sub-morpheme /lm_/.

(12) Sub-morpheme: /lg_/
Semantic description: "stretching and extending with some sense of stickiness and elasticity"
Number of etymons: 12
List of etymons: lg, lgm, lgs, lgš, lgb, lgt, lgč, lgn, lgz, lgd, lgt', lgf

The sense of "stretching or extending" is observable even in the very narrow definition of *lägga* as "bat a ball". The metaphorical (or idiomatic) definition of "drag one's feet" of *läggämä* hints that the common meaning of "shirking work or being too lazy to work vigorously" is founded on the sense of "stickiness and elasticity". The generous extension of hand is central in the "giving abundantly" meaning of *läggäsä*. Senses of "sticking out or extending" are evident in "bringing closer a vessel in anticipation of transfer of content from a container" in *läggätä.*

(13) Sub-morpheme: /ml_/
Semantic description: "sliding, gliding, and smoothing"
Number of etymons: 20
List of etymons: ml, mls, mlk', mlt, mltg, mlk, mlks, mlkt, mld, mlj, mlg, mlgš, mlgd, mlgt', mlt', mlt'n, mlt'n, mlč', mlf, mlft'

The senses of "sliding and gliding" go hand in hand with flat and relatively smooth surface. The resulting leveling and the sliding off of the excess in the process of filling up a container

with grains or liquid can be felt in the "fill up, abound, overflow, rise" definition of *mälla*/*m^{w}älla*. The same sense may not be easily felt with *mälläsä* which is commonly defined as "return, bring back". It seems to have lost too much ground that only the abstract extended senses are central in the definitions. However, the derived form *mälässäsä* "lie flat and smooth" connects it to its basic concept of "gliding or sliding back". Of course, other definitions such as "recover" and "roll back" connect it well to its origin. *mallägä* and *mällät'ä* bear the sense of sliding and gliding vividly in their central meaning.

(14) Sub-morpheme: /mn_/
Semantic description: "off, away, yank, pull out"
Number of etymons: 40
List of etymons: mn, mnst, mnš, mnšr, mnk', mnk'l, mnk'r, mnt, mntl, mntg, mntf, mnčl, mnčk, mnčg, mnčf, mnň, mnk, mnks, mnz, mnzl, mnzr, mnzk, mndl, mnds, mndr, mndb, mndg, mnjr, mnjz, mng, mngl, mnt', mnt'l, mnt'r, mnt'k', mnt'z, mnč', mnč'r, mnč'k', mnf

It appears that many of the etymons and their derived forms in this set have a part or parts violently pulling out of a whole. The "going off, away" semantics of the sub-morpheme is evident in *tä-mänattälä* "be torn between" (which translates into "difficulties" or the cause of "failure" in the dictionary definition), *mänäk'k'ärä* "tear up, break up", *mänät't'ärä* "clear, deforest", *mänäddägä* "pull out" and even in *mänännä* "retire from the world". Some of the etymons have a history of formation from the instrumental affix /m-/ as in mnč' < m-nk'ʔ "spring water", mnš < m-nsʔ "winnow" and mnt'k' < m-nt'k' "snatch". Still the instrumental function of the morpheme conforms to the sub-morphemic semantics of the consonant in signaling the "handling" aspect of the violent pull out (see the following section for the generalized semantics of /m/).

(15) Sub-morpheme: /sl_/
Semantic description: "simple, smooth, soft"
Number of etymons: 19
List of etymons: sl, slm, slmt', sls, slk', slk't', slb, slt, slč, slk, slw, slwd, slj, slg, slgb, slt', slt'n, slf, slfd

The "sharpness" or "goodness" in *sälla*, the "fainting" in *tä-slmällämä*, the "swallowing without chewing" in *säläk'k'ät'ä*, the "slithering" in *tä-släkällkä*, the "skillfulness" in *sälät't'änä*, even the "boredom" in *säläčča* have all a sense of simplicity and smoothness embedded in their semantics. Interestingly, the semantics of /sl_/ is so close to the same phonaestheme in English and some other Indo-European languages (see Abelin 1999 and Magnus 2001).

(16) Sub-morpheme: /sn_/
Semantic description: "connect, intercept, break into"
Number of etymons: 30
List of etymons: sn, snsl, snk', snk'r, snbr, snbk', snbt, snbk, snbg, snbt', snt, sntr, snň, snkl, snkr, snzr, snd, sndr, sndk', sndb, sng, sngl, sngr, sngč', snt', snt'r, snt'k', snt'b, snf, snft'

As much as the etymons in this group can be connected, the link between them is the sense of "connecting, running through, or breaking into". Particularly, the sense of "breaking into" is felt in the "wedging between" definition of *sänäk'k'ärä*. The "splitting" in *sänät't'äk'ä* and *sänt't'ärä*, the "interception or impediment" in *sänäkkälä*, *sänäkkärä*, and *sänäggärä* are also from the same sense in /sn_/. Splitting and binding seem to be connected together by the sub-morpheme /sn_/. As distant as it sounds from the sense of "connection", the definition "packing of provisions for a trip" of *sännäk'ä* hints the same semantics of the /sn_/ in the tying of the sack in which the provisions are held. The sense of "holding tight" in the many definitions of *sännägä* binds it to its inherited semantics from the sub-morpheme.

(17) Sub-morpheme: /t’r_/
Semantic description: “tighten, cram, jam”
Number of etymons: 21
List of etymons: t'r, t'rm, t'rms, t'rmt, t'rs, t'rsm, t'rk', t'rk'm, t'rk'š, t'rb, t'rnk', t'rň, t'rk, t'rh, t'rwz, t'rz, t'rž, t'rg, t'rt'm, t'rt's, t'rf

The jamming and cramming force is felt in *t’ärämmäs* “run over, breach”, *t’ärräk’ä* “fasten, nail”, *t’ärk’k’ämä* “slam, hold tight”, *t’ärräzä* “bind, tie up”. It is also in *t’ärrägä* “wipe” with lesser intensity and less obviousness. In *tä-nt’ärawwäzä* “move about with difficulty” it may even be less noticeable, because the “tightness” is only implied.

(18) Sub-morpheme: /t’n_/
Semantic description: “resist, toughen, stiffen”
Number of etymons: 23
List of etymons: t'n, t'ns, t'nk', t'nk'l, t'nk's, t'nk'r, t'nb, t'nbs, t'nbr, t'nbk', t'nbz, t'nbf, t'nkr, t'nwt, t'nz, t'nzl, t'nzb, t'ng, t'ngl, t'ngr, t'ngd, t'nf, t'nfr

Strength and firmness is reflected in this group of etymons. The verbs *t’änna* “firm, strong, resistant” and *t’änäkkärä* “strong, powerful, vigorous, tough” seem to be the best representatives of the sub-morpheme and the group. In other roots “toughness” and “resistance” are associated with the activities or objects involved. “Toughness” is implied in the semantics of the following verbs in various ways: *tä-t’änawwätä* in the “lasting harm caused”, *tä-t’änäk’k’äk’ä* in the degree of “cautiousness and prudence”, *t’änägga* in the tightness of the “weaving together, fixing up”, and *t’änäzza* in the “undercooking”.

To summarize, we have seen that varieties of etymons that do not have any derivational relations other than being grouped together for sharing pairs of consonants exhibit strong semantic resemblance. The semantic connections observed in each group of etymons are testimonies to the generalization that those common meanings are associated with those shared

initial pairs of consonants. With this in mind, let us now consider the pairs of consonants in the final position of the etymons.

4.3.2 The final pairs

This sub-section focuses on the sub-morphemic pairs of consonants found at final position of the etymons. Some twenty-one sub-morphemic pairs of consonants representing the eleven sample phonemes are selected. The analysis is presented in a similar manner as in the preceding sub-section.

Here are the sample sub-morphemic pairs in alphabetical order.

(1) Sub-morpheme: /_bd/
Semantic description: "Weigh down; Fall heavy"
Number of etymons: 16
List of etymons: lbd, lnbd, rbd, šbd, k'šbd, k'bd, ʔbd, kbd, wlbd, wnbd, zlbd, zbd, jbd, grbd, gbd, č'bd

There is "heaviness" of coating and pressure in the "making plain and flat" semantics of *läbbädä*. The "sinking of ground" in *räbbädä* has "heavy falling". The verb *käbbädä* is straightforwardly "heavy". The senses of "Weighing down" and "heavy falling" are in the "cutting of tree trunk into big logs" meaning of the verb *gäbbädä*. The metaphorical meaning of "Talking off of one's head" in *zäläbbädä* has a sense of not being able to keep the "weight" of secret by dropping statements out of control. "Heaviness" is also in the "crumpling" pressure of *č'äbb^{w}ädä* as well as in the "bending from gravity and lack of support or undistributed weight" of the verb *länäbbädä*.

(2) Sub-morpheme: /_bt'/
Semantic description: "Bulge, show, bring out; Harden, thicken"
Number of etymons: 18
List of etymons: lbt', lnbt', srbt', snbt', šgbt', k'lbt', k'rbt', k'bt', k'nbt', nbt', ʔbt', zbt', znbt', glbt', grbt', gbt', gnbt', č'bt'

The "bulge" from "Overlaying and encasing" in *läbbät'ä*, or from "bending" in *länäbbät'ä*, or from "swelling" in ʔabbät'ä show the semantic property of /_bt'/. *g^{w}äräbbät'ä* is the tactile feeling of 'bumps'. The "shooting of buds" in *k'änäbbät'ä* and the "showing of a small bump on the skin" in *k'^{w}äräbbät'ä* share the same sense of "buldging". The metaphorical use of *k'äbbät'ä* to mean "behave unsuitably, act or talk heedlessly" may have obscured its basic semantics of "small budge" which led to the intermediate sense of "showing off" in a plain surrounding. The "grabbing and squeezing" in *č'äbbät'ä* result in a "bulge". The same semantic property works only in different directions in roots of the same etymon: *g^{w}äbbät'ä* "bend, form hump" and gbbt' "cave, carve".

(3) Sub-morpheme: /_dl/
Semantic description: "Bring down; Put on"
Number of etymons: 14
List of etymons: mndl, mdl, šndl, k'ndl, bdl, ndl, ʔdl, wdl, gmdl, gndl, gdl, t'bdl, t'dl, fdl

The sub-morpheme /_dl/ represents the concept of "imposing some weight" either as the "hardship" in *bäddälä* "mistreat, inflict hardship" or as "some body mass" as in *wäddälä* "become fat, stout" and *t'äbäddälä* "become big, stocky". The weight may be "distributed" as in *ʔaddälä* "hand out, allot" or that "breaks away" as in *gämäddälä* "take a large chunk". The imposition of weight can "break open" as in *näddälä* "bust, perforate", "reduce portion" as in *g^{w}äddälä* "decrease" or "eliminate altogether" as in *gäddäl* "kill".

(4) Sub-morpheme: /_dr/
Semantic description: "Ground, Hold on to ground"
Number of etymons: 19
List of etymons: mndr, mdr, sndr, sdr, šndr, šdr, k'ndr, k'dr, bdr, ʔdr, kdr, wdr, dndr, ddr, gndr, gdr, t'dr, č'dr, fndr

The verb *mäddärä* "push against the ground" seems to be a denominal derivation from the word *mïdïr* "land, earth". Since many of the etymons in the group clearly show the sense of "grounding" clearly it is associated with the sub-morpheme /_dr/. *ʔaddärä* "dwell, live" is one of the highly exploited etymons to derive multiple roots and stems which directly or metaphorically relate to the basic concept of "land, earth". The etymons with a sense of "footing, standing" such as *wäddärä* "stand in competition", *tä-gdäräddärä* "stagger" *säddärä* "post, stand in line", have the semantic property of /_dr/ at their core. The sense of "firmness" in *däddär*ä "harden" and *dänäddärä* "stocky, stout" are not too far removed from "ground".

(5) Sub-morpheme: /_fr/
Semantic description: "Heave; Hover, expand"
Number of etymons: 17
List of etymons: sfr, šfr, k'fr, čfr, nfr, ʔfr, kfr, wfr, zfr, dfr, gnfr, gdfr, gfr, t'nfr, t'fr, č'nfr, č'fr

"Banding together or the resulting increase in mass" is the characteristic feature of the etymons sharing /_fr/. "Grain being measured in a container, or a swarm of birds roosting or people settling" signaled by *säffärä* carry a sense of banding together and increase in mass. The heaving from "seething" in *näffärä*, the "increase in thickness or fat" in *wäffärä*, the "growing of dense hair" in *g^{w}äffärä*, the "expansion of foliage" in *zäffärä* are all instances of "heaving". *tä-nkäfärrärä* "dry out, stiffen" and *t'äffärä* "drying of a strip of raw hide", and *č'äffärä* "band together" feature the contraction of the elements of a body. The gathering of courage to

"encroach others' boundaries" in *däffärä* and the "cringing" from fear in *ʔaffärä* are quite opposite. However, both feature the gathering of elements.

(6) Sub-morpheme: /_fn/
Semantic description: "Enclose; Blanket"
Number of etymons: 12
List of etymons: sfn, šfn, k'fn, čfn, ʔfn, kfn, wlfn, zfn, dfn, gfn, t'fn, č'fn

The source of the sense of "blanketing" shared between *säffänä* "Pervade, prevail, dominate" and *šäffänä* "cover, screen" goes beyond the sub-morpheme /_fn/ since <šfn> is the extended root of <sfn> as a result of augmentation of the palatal feature on /s/. Nevertheless, the sense of "enclosure" is very sound in roots of distinct origin such as *käffänä* "enshroud, wrap up a corpus", *č'äffänä* "close the eyelids", *k'äffänä* "clench". It is even tighter in *ʔaffänä* "suffocate, muffle, stifle" and *däffänä* "plug up, block up".

(7) Sub-morpheme: /_gr/
Semantic description: "Post; Fix"
Number of etymons: 24
List of etymons: mgr, sngr, sgr, šngr, šgr, bgr, tgr, čgr, ngr, ʔgr, wšgr, wngr, wgr, zngr, zgr, žgr, dngr, jgr, ggr, t'ngr, t'gr, č'gr, fngr, fgr

The trotting movement in *säggärä* requires sticking firm and pulling soft of the feet on and off the ground. Crossing over in *šäggärä* "cross" has a similar requirement as *säggärä*. In fact, <šgr> could be the augmented form of <sgr>. In *tä-bäggärä* "be overcome by force" at the core of the semantics is "losing one's footing". The "haggling" in *täggärä* is about keeping one's "footing". The definition "perturbed, agitated" for *tä-dänaggärä* is a metaphorical extension of "hobble" from *dänäggärä* which is also based on the "fixture of foot on the ground". Sticking to the ground is in *gäggärä* "harden, stick" and *fäggärä* "paw the ground".

(8) Sub-morpheme: /_gd/
Semantic description: "Drive; Force"
Number of etymons: 24
List of etymons: lgd, mlgd, mrgd, mgd, srgd, sgd, rgd, šrgd, šgd, brgd, bžgd, ngd, ʔgd, wlgd, wgd, zlgd, žrgd, žgd, jgd, grgd, t'ngd, č'rgd, č'ngd, č'gd

Etymons ending with /_gd/ have a tendency of forcing and driving or counteracting such a force. "Feeding the fuel wood to fire" in *maggädä* has a sense of "pushing" or "forcing". The other less common meaning of the word "drive a stake in the ground" may be even closer to the semantics of the etymon and the sub-morpheme. A charge of force is so salient in the impact of *särgg^{w}ädä* which results in "denting", and in *bäräggädä* which results in "bursting or flinging a door open". The force of /_gd/ "removes" things in *wäggädä*, "mows down" in *č'äräggädä*, and "stops, blocks a move" in *ʔaggädä*.

(9) Sub-morpheme: /_k'l/
Semantic description: "Rise; Lift"
Number of etymons: 20
List of etymons: msk'l, mk'l, nk'l, mnk'l, sk'l, sbk'l, šk'l, šnk'l, k'k'l, bsk'l, bk'l, znk'l, dk'l, dnk'l, gsk'l, gnk'l, t'k'l, t'nk'l, č'k'l, fnk'l

"Tugging" is involved in the meanings of *näk'k'älä* "pull out, uproot", *mänäk'älä* "dismantle", and *fänäk'älä* "dislodge, uproot". The result in all is removing a part by lifting. The "rising, lifting" sense is also central in *bäk'k'älä* "shoot up, grow", *g^{w}änäk'k'^{w}älä* "sprout, germinate". The verb *säk'k'älä* "hang, mount" has essentially the "lifting, rising" sense. The verb *mäsk'äl* is an instrumental nominal that refers to the cross from the root <*sk'l*> with the affixation of /m-/ where the basic root was mainly associated with crucifixion. In a later development a denominal root *msk'l* was formed with the meaning of "crisscross". The sense of "rise, lift" in this derived root is better felt from its original root <*sk'l*>. The compound verbs

dänäk'k'ʷälä and *t'änäk'k'älä* or *t'änäk'k'ʷälä* are defined as "peck, scooping up with a finger", which fits into the sense of "lifting, rising".

(10) Sub-morpheme: /_k'r/
Semantic description: "Wedge; Peck"
Number of etymons: 17
List of etymons: mk'r, mnk'r, snk'r, šk'r, šnk'r, k'k'r, bk'r, nk'r, ʔk'r, wk'r, dk'r, dnk'r, t'k'r, t'nk'r, č'k'r, č'nk'r, fk'r

The sense of "wedging and pecking" results in the common meaning of *mänäk'k'ärä* "tear up and break up of a structure". The verb *sänäk'k'ärä* has a "wedge" stuck in something. In *wäk'k'ärä* "chisel, pit stone" it is the "wedging and pecking" that chips the structure. The verb *dänäk'k'ärä* "bar, bolt" has an obstacle wedged at a passage way. Notice here that the common meaning "deaf" in the verb *dänäk'k'ʷärä* is probably the metaphorical extension of the sense of "baring and bolting" of the ears or associated with the non-responsive staleness of the disabled. In *t'änäk'k'ärä* "the wedge fills in and gets stuck in a narrow space". The sense of "pecking" underlies the slightly altered semantics of *anäk'k'ärä* "brings out the last drop of liquid". In *šänäk'k'ʷär* "penetrate, make a hole" the "wedge and peck" leave a hole in a structure.

(11) Sub-morpheme: /_lg/
Semantic description: "Lax, viscous"
Number of etymons: 14
List of etymons: mlg, mtlg, mzlg, slg, šlg, blg, tlg, wlg, zlg, žlg, t'lg, t'wlg, č'lg, flg

The verb *malläg* expresses the extreme slippery state of a viscous lubricant. A similar sense is used with *walläg* to metaphorically indicate "shirking, sneaking and slipping away from work". Also with *balläg* "a misbehaving child or an adult involved in illicit sex" are being too "lax" against the social norm. "The pulling and snatching of flesh" as in gnawing or vigorous

sucking in *mätällägä* or pinching in *mäzällägä* are centered on "laxity" of the object. The "drooping" of a leaf from lack of water in *t'wllg* and the shrinking of abdomen in *sälläg* involve "laxity". The sense of "laxity" may be very remote in *fälläg*. However, it is traceable in its definition of "looking after and rummaging" than in "desiring", because the former connects it to "following track in search" which has "laxity" and "stretching" in the continuity.

(12) Sub-morpheme: /_lt'/
Semantic description: "Slip away, glide"
Number of etymons: 17
List of etymons: mlt', mslt', mzlt', slt', sglt', k'lt', blt', ʔlt', klt', wlt', zlt', dlt', jlt', glt', gšlt', č'lt', flt'

The "bald" in *mällät'ä* is somehow felt in the smoothness of "escape, slip away" in *amällät'ä*. Unobstructed easy and fast motion on a smooth or lubricated surface is in the etymon *mlt'*. The "unsheathing of a sword" or the "drawing out of cudgel" in *mäsällät'ä* or *mäzällät'ä*, or the "gulping of drink" in *č'ällät'ä*, or the "stripping of skin" in *gäšällät'ä* are fast and easy going smoothly without obstruction. "Ease and quickness of activity" in *sällät'ä* are also components of "success" in the definitions of its derivatives as well as in *bällät'ä*. "Ease and simplicity" in *ʔllät'ä* translate into measures of comfort and challenge in *allïč'č'a* commonly referring to "mild sauce (compared to a spicy hot one)". Metaphorically, it implies "boredom and lack of challenge".

(13) Sub-morpheme: /_mr/
Semantic description: "Fit, put together"
Number of etymons: 11
List of etymons: smr, šmr, k'mr, ʔmr, kmr, zmr, dmr, jmr, gmr, t'mr, č'mr

The "fitting together" sense of *sämmärä* results in "alignment, straightness, matching, and harmony". In *šämm^{w}ärä* it takes twist to be "indirect criticism". The sense of "formulating or calculating" of *k'ämmärä*, or "adding and stacking up" of *dämmärä* or "pairing" of *t'ämmärä*, or "topping up, augmenting" of *č'ämmrä* all call on the idea of "brings and fits things together". "Putting together" is also noticeable in "growing in size" sense of *kämmär* and *gämmrä*. The verb *jämmrä* in the sense of "initiate" might also have its semantic base in "growth" where the beginning of change is observed as increment; that connects it to *gämmrä*.

(14) Sub-morpheme: /_mt'/
Semantic description: "Shrink; suck in, press down"
Number of etymons: 20
List of etymons: lmt', slmt', smt', rmt', šmt', šgmt', k'lmt', k'mt', k'rmt', ʔmt', klmt', kmt', wlmt', zrmt', dlmt', dmt', glmt', gmt', grmt', gšmt'

The "shrinking and suppression" in *lämmät'ä* is softer that it results in "bending", but it is stronger in *gämmät'ä* that it results in "severing a part". It is even stronger and violent in *gärämmät'ä*. The verb *k'^{w}ämmät'ä* has similar strong sense of "shrinking" in its meaning of "severing", but it sounds that the process is faster and softer and the part severed relatively smaller. The verb *tä-k'ämmät'ä* "sit, be seated" has also a sense of "shrinking" in "taking less space" in volume or movement. The "crushing flat" meaning of *dammät'ä* has the "shrinking" sense clearly, but if *adämmät'ä* "listen" has connection to the senses of the etymon *dmt'* it must be by way of "sucking in" like *sämmät'ä* "go deep, sink".

(15) Sub-morpheme: /_nk'/
Semantic description: "Squeeze, tighten; Animate"
Number of etymons: 14
List of etymons: mnk', srnk', snk', ʔnk', zrnk', znk', žnk', drnk', dnk', t'rnk', t'nk', č'rnk', č'nk', fnk'

The verb *ʔnnäk'ä* "chock, strangle" and *säränäk'ä* "come through the nose" are based on the "tightness" of air passage. The verbs *zäränäk'ä* and *däränäk'ä* both mean "stuff, press, squeeze, cram" in a "tight" space. *t'äränäk'ä* means "tie, bind or hold tight". The mental state of "distress, oppress" in the definition of *č'änäk'ä* is abstracted from the physical "tightness and stiffness". The original semantics of "tightness" in *tä-t'änäk'k'äk'ä* doesn't seem to be too remote for the metaphorical meaning "careful, cautious, prudent"; another derivative *t'annäk'ä* shows it even more clearly in its meaning of "be caught in quagmire".

(16) Sub-morpheme: /_nf/
Semantic description: "Fan; Pump"
Number of etymons: 11
List of etymons: mnf, snf, šnf, k'nf, čnf, krnf, knf, znf, dnf, gnf, t'nf

"Loss of strength and vigor", a sense that can be metaphorically connected to the loss or shortness of breath (air), is observable in this group of etymons. Loss or shortness of breath seems to be the symbolism of the sub-morpheme /_nf/. The verbs *männäfä* "be worthless, useless, fool"; *sännäfä* "be lazy, feeble, sluggish"; *t-šännäfä* "be vanquished, defeated"; *dänäffäfä* "be slow, tardy" or *dänäffa* "boast, brag" all of these show some kind of exhaustion and weakness. The verbs *zännäfä* "slip and hang down" and *g^{w}ännäfä* "draw back, shrink" both for cloths, indicate "slackness" which in a way is lose of breath or steam.

(17) Sub-morpheme: /_rk'/
Semantic description: "Squeeze, crack, break out, emit, drain"
Number of etymons: 19
List of etymons: mrk', srk', šbrk', brk', bt'rk', bč'rk', nt'rk', nfrk', ʔrk', wrk', zbrk', zfrk', drk', t'rk', t'brk', č'rk', č'brk', frk', ft'rk'

The "breaking in" and "taking away" of *särräk'ä* "steal, rob" is founded on the "breaking out through a narrow passage" sense of the sub-morpheme /_rk'/. "Breaking out of loud sound and

emitting of light" are the foundations of the meaning of *bärräk'ä* "lightening, thunder". *bät'ärräk'ä* "split open", *färäk'k'a* "split", and *fät'ärräk'* "smash" all share the sense of "breaking open". *šäbärräk'ä* "sparkle" and *t'äbärräk'ä* "glitter" have the intermittent reflection as "emission" or "breaking out" of light. The "splash" in *bäč'ärräk'ä* or *č'äbärräk'ä* is also the "breaking out" of the liquid. The "blessing or benediction" in *märräk'ä* seem to be too remote from the sense shared by other etymons in the group. However, relating it to the indigenous tradition of blessing accompanied by sprinkling of *mïrak'*[18] "spittle", it is not difficult to see the phono-semantic heritage of /_rk'/ and its sense of "breaking out and emitting".

(18) Sub-morpheme: /_rg/
Semantic description: "Reach across or through; connect"
Number of etymons: 16
List of etymons: mrg, mzrg, srg, šrg, brg, bdrg, trg, ʔrg, wrg, zrg, žrg, drg, jrg, t'rg, č'rg, frg

The phonaestheme /_rg/ has a sense of motion that gets through and reaches across or connects multiple points in space. It is reflected in *särrägä* "percolate, sip into", *bärägäggä* "startle and flee", *t-wrägärrägä* "swing, shake, strut", and *tä-frägärrägä* "be filled with interstices". In the "sweeping" of *t'ärrägä* the same sense is felt as the broom drags all the particles at ones along all the surface points. The filling in of mud between wall posts in *märrägä* "daub, chink, plaster" has a strong sense of "connecting across". One has to see the "climb, develop in height" definition of *ʔarrägä* to observe the "connecting across" sense in the meaning. In fact, the "get old" definition is not too far removed either if looked at from the perspective of "growing through the ages".

[18] Leslau (1969), Podolsky (1991), and Kane (1991) all trace the origin of the verb *märräk'ä* "bless" to the denominal base *mïrak'* "spittle".

(19) Sub-morpheme: /_sm/
Semantic description: "Slow ending, fading"
Number of etymons: 11
List of etymons: k'sm, k'rsm, klsm, ksm, dsm, drsm, gsm, grsm, t'lsm, t'rsm, flsm

The phoneme /s/ doesn't seem to be favored in the penult position in Amharic that there are relatively fewer final pairs with it. /_sm/ which somehow qualified to be selected in the sample tends to be associated with "fading out and slow ending". The "drying up of wound" and "wilting of plants" in *kässämä* and the soft touch in "prod, poke" of both *g^{w}ässämä* and *dässämä* indicate the fading of energy or motion. The careful and meticulous "painting of spots and stripes" in *t'älässämä* and the "picking of nectar" in *k'ässäm* are associated with the soft touch of /_sm/.

(20) Sub-morpheme: /_t'r/
Semantic description: "Distinctness, identity"
Number of etymons: 26
List of etymons: mst'r, mnt'r, mt'r, sbt'r, snt'r, st'r, šmt'r, šk't'r, št'r, k'bt'r, k'nt'r, k't'r, bt'r, nt'r, ʔt'r, wt'r, zbt'r, znt'r, zt'r, gnt'r, gt'r, gft'r, t't'r, č't'r, fnt'r, ft'r

The concept of "distinctness and identity" seems to be too abstract and fuzzy to be a common connection to this group of etymons. However, it is observable in many of the etymons and connects the group more than any other property. "Identity" is hidden in *mäsät't'ärä*, exposed in *mänät't'ärä*, and mixed in *säbät't'ärä*. The separation of small units as individual identities is observable in "splinter" of *sänät't'ärä*, in the "combing, carding or sifting" of *abät't'ärä*, and in "distillation" of *ʔanät't'ärä*. The many roots and derivatives of <k't'r> represent the sense of identity in different ways: "the counting of individuals" in *k'^{w}ät't'ärä*, the "fixing of specific time" and also the "delimiting of border" in *k'ät't'ärä* are all about "distinguishing and

identifying". The verb *fät't'ärä* which means "creation" has the semantics of "identity" right at its core.

(21) Sub-morpheme: /_t'k'/
Semantic description: "Attach/detach"
Number of etymons: 12
List of etymons: lt'k', mnt'k', mt'k', snt'k', st'k', bt'k', tt'k', nt'k', ʔt'k', wt'k', fnt'k', ft'k'

The sub-morpheme /_t'k'/ seems to represent opposing concepts of "attaching and detaching". Applied to a context of identity, the concept in the sub-morpheme is interpreted as "detaching", whereas in context of diversity it is interpreted as "attaching". It is about closeness: coming to or away from. The functioning of the sub-morpheme also conforms to the semantics of the other components of the etymons and the roots. *lät't'äk'ä* "join, connect, follow immediately" *tat't'äk'ä* "tie waist, girdle", and *wät't'äk'ä* "stuff, cram" carry the "attaching" sense of the sub-morpheme. Verbs like *mänät't'äk'ä* "snatch", *mät't'äk'ä* "rise, shoot up" *sänät't'äk'ä* "split" and *fänät't'äk'ä* "splatter, splash" carry the "detaching" sense of the same sub-morpheme. Notice that the sense of "detaching" conforms to the initial sub-morphemes /mn_/, /sn_/, and /fn_/of those etymons.

In summary, like in the case of the initial pairs the generalized semantics of the final pairs also closely connect together the individual roots and their derivatives by their fundamental semantic properties. However, the connections between some roots become clear only after their metaphorical and context-bound referential aspects of meaning are neutralized. It is also observable in the descriptions that similar pairs of consonants found at different edges of the etymons exhibit semantic similarity which points towards the phono-semantic unity of identical consonants in all positions.

4.4 The phono-semantic trends of phonemes of higher distribution

As demonstrated in the preceding section the comparison between the etymons revealed strong semantic connections between the etymons sharing similar pairs of consonant in analogus positions. Based on the generalizations about the sematic properties of the sub-morphemic pairs that classified numerous etymons, the semantic associations of the individual phonemes were examined. In this section we will look at the analysis of sub-morphemic semantics at the phoneme level by pinpointing the semantic contribution of the individual phonemes to the semantics of the sub-morphemic pair and to the root or the etymon.

The 11 consonants selected as sample for their high frequency of occurrence and high distribution were the following: /b, d, f, g, k', l, m, n, r, s and t'/. The 61 sample sub-morphemic pairs were made up of the same set of 11 consonants. In forming those pairs each consonant occured in 11 pairs on average in the range of 9-13.

The semantic properties of those consonants were abstracted from the sample etymons that were represented by the sub-morphemic pairs. All the sub-morphemic pairs that contain a particular target consonant were examined for some common semantic properties. The observed common meanings were stated in generic terms and further checked against some actual derived forms for conformity. The semantics of the sample phonemes are described below with instances of all the sample sub-morphemes and a couple of actual words for each sub-morpheme.

/b/ "Build-up or release of pressure; opening, out"

In /bl_/ and /br_/ roots where /b/ is at initial position the semantics of the root tends to be that of culmination and release of already built up pressure leading to interpretations such as letting, opening up, and diffusion, dispersal, disappearance, etc. The "striking of fire" in ***bl****d*, the "surpassing" in ***bl****t'*, the "flinging of a door" in ***b****rgd*, and the "lightening and thundering" in ***b****rk'*

are all direct outcomes of built up pressure. In penult and final positions it matches with some sense of build-up of pressure. For instance, the application of pressure is noticeable in /db_/ roots in the dominant sense of accumulation of mass as in *d**bl*** "band together", and *d**b**r* "grow". /_bd/ and /_bt'/ roots also encode the semantics of pressure as "weight" in *k**b**d*, "density" in ***lb**d*, or "bulge" in *g**b**t'*.

/d/ "Gravitation, weighing down, grounding"

The "weight, gravity and grounding" sense associated with /d/ is evident in most of the roots examined under the sample pairs of consonants. The generalized senses of "mass accumulation" with /db_/ roots, "hardening and density" with /dn_/ roots, "weight and pressure" with /_bd/ roots straightforwardly reflect the semantics of /d/. There is "weight" in "banding together" of ***d**bl* and in the "growing heavy" of ***d**br*. The metaphore of being petrified (= *dngay* "stone") in ***d**ngt'* "startle" and ***d**nk'* "astonish" has a sense of "weight" from "stiffening of the body" in extreme cases of such sensations. "Weight" is obvious in *kb**d*** "heavy". It is also involved in the "pressing down" of ***lb**d*. The "taking down" in *g**d**l* and the "drilling" in ***nd**l* involve all the senses of /d/. "Grounding" is salient in *w**d**r* "drive stake into the ground" and *m**d**r* "hold on to the ground". More of "gravity" is felt with the "drive, force" senses of /_gd/ roots such as *mg**d*** "feed to fire; insert" and *brg**d*** "fling a door".

/f/ "Air and gas movement"

/f/ signifies motion within a matter as an internal dynamics which is manifested mainly in a form of "heaving and leaking", varying in intensity. The movement of air and liquid with expansion and shrinking are characteristic meanings of /f/. The "charge, push" in /gf_/ roots as in *g**f**t'* "hurl oneself at an object", *g**f**t* "foam, froth", and the "opening up, release" in /fn_/ roots as in ***f**nk'**l*** "pry up", and ***f**nd* "explode" indicate the explosion of pressure. The loss of integrity in

f*rs* “fall apart” and in ***f****rt’* “burst” and the loss of vigor in *sn****f*** “feeble” and in *gn****f*** “floppy” are the metaphorical extensions of the sense of “leakage”. The “heaving” sense of /f/ is observable in /_fr/ and /_fn/ roots. Both *s****f****r* “fill up space” and *d****f****r* “face up” indicate coming out (in mass and with courage). *d****f****n* “plug up” and *s****f****n* “prevail” indicate control of pressure with implication of expansion as the pressure builds.

/g/ “Moving force (pull/push)”

/g/ signifies a mechanical force observed in the movement of a substance against or away from another substance often resulting in collision or secession. Such a force is represented as “cutting across” in /gr_/ roots as in ***g****rd* “screen, vile” and ***g****rs* “cut down”, and as “posting, digging” in /_gr/ roots as in *f****g****r* “paw the ground” and *dn****g****r* “fix on the ground”. The /gf_/ and /_gd/ roots discussed above with respect to /f/ and /d/, respectively, represent the “charging” force and the resulting “collision” in /g/: ***g****ft’* “hurl oneself at an object”, ***g****ft* “foam, froth”, *m****g****d* “feed to fire; insert”, and *br****g****d* “fling a door”.

/k’/ “Transition or interruption of motion; (turning point, change)”

Signaling emergence, sudden turn or end of an event is the characteristic semantic property of /k’/. The transition of state is marked by /k’/ in /k’l_/ roots as in ***k’l****m* “change color” and ***k’l****t’* “melt”. “Emergence” is salient in /_k’l/ roots as in *b****k’l*** “shoot up, germinate” and *s****k’l*** “lift up, hang”. The culmination of the event in /_rk’/ roots is marked by /k’/ as in *br****k’*** “flashing of lightening and booming of thunder” and *dr****k’*** “dry”. The secession of a part in /k’r_/ and /_t’k’/ roots is signaled by /k’/ as an emerging event as in ***k’r****s* “tear off” and ***k’rf*** “peel” and as a culmination of the secession as in *snt’****k’*** “split up, cleave” and *mnt’****k’*** “snatch”. The “jamming” in /_k’r/ roots as in *t’n****k’r*** “wedge” and *sn****k’r*** “bar, bolt” is marked by /k’/ as a sudden turn or

end of event. Sudden end is also felt in the "stoppage, closure" of /_nk'/ roots as in *t'n**k'*** "tighten" and *dn**k'*** "astonish".

/l/ "Loosening into flexibility or liquidity (degeneration of energy)"

/l/ seems to deserve the label "liquid" in Amharic not just for its phonotactic role but also for the semantics it injects into the roots. Wherever this 'oily' sound is found it seems to signal weakness in resistance, looseness in composition, smoothness and flexibility in form and structure. "Flexibility" is dominant in /lm_/ roots with their semantics of "adaptive change of form" as in ***l**ms* "paralyze, cripple" and ***l**mt'* "bend". The "elasticity and stretching" in /lg_/ roots: ***l**gm* "work slowly"; ***l**gs* "give liberally", the "gliding and sliding" in /ml_/ roots: *m**l**g* "vicious, sticky"; *m**l**t'* "bald", the "slippery" in /_lt'/ roots: *k'**l**t'* "melt, liquefy"; *b**l**t'* "surpass", the "softness and smoothness" in /sl_/ roots: *s**l**k'* "grind finer"; *s**l**k* "creep" are all acquired mainly from the "unstable structure" semantics of /l/. Similar semantics is also observable with variable degree of transparency in /k'l_/, /bl_/, /_lg/ roots: The smooth shift or transition in change of color, structure or position in roots such as *k'**l**m* "sully", *k'**l**t'* "melt, liquefy", *b**l**s* "discolor", *b**l**t'* "surpass", ***fl**g* "track, search", and *m**l**g* "vicious". In final position of /_k'l/ and /_dl/ roots it seems to soften the impact of "sudden turn" of /k'/ and the "gravity and weight" of /d/ as in *sk'**l*** "hang, hoist", *bk'**l*** "shoot up, germinate", *gd**l*** "reduce", and *nd**l*** "drill".

/m/ "Contact; control, closure"

The semantics of /m/ is not so transparent. However, some sense of tactile feeling, handling, and controlling with direct or indirect contact is observable. The "sliding" and "gliding" in /ml_/ roots: ***m**lg* "vicious", ***m**lt'* "bald" are tactile feelings marked by /m/. The "yanking" in /mn_/ roots: ***m**nč'r* "strew", ***m**ndg* "pull out" involve manual action. The "adaptive change of form" exemplified in *l**m**d* "learn, adapt habit" and *l**m**t'* "bend" imply direct or indirect control. "Putting

together" in /_mr/ roots: *t'**m**r* "put together" and *k'**m**r* "prepare", the "pressing down" in *d**m**t'* "crush flat" and *l**m**t'* "bend" have manipulation. Closure and end are implied in /_sm/ roots of *ks**m*** "dry up wound" and *ds**m*** "fence with thorn hedge".

/n/ "Intensity of effect"

In its overwhelming occurrence in penult (for quadri-consonantals antepenult) position /n/ seems to mark the transition of force into effect with intense outcome. The "yanking" force in /mn_/ roots ends with the effect of "scattering" in *m**n**k'r*, and "snatching; uprooting" in *m**n**t'k'*. The force that "breaks into" in /sn_/ transitions into the effect of "jamming" with *s**n**k'r* and "split up" in *s**n**t'k'*. The gravitiy of /d/ seem to have a collision-like effect in *d**n**gt'* "startle" *d**n**k'* "astonish" due to intensification by /n/. What appears to be a soft air movement in /f/ transitions into explosive effect via /n/ in /fn_/ roots ***fn**d* "explode" and ***fn**k'l* "pry up". Even at root final position the intensifying effect of /n/ is felt. The "blockage" in *df**n*** "plug up" is so tight; the extent of "coverage" in *sf**n*** "prevail" so broad, all due to the effect of /n/. The reversal of "explosion" into "flattening" as /_fn/ becomes /_nf/ in *s**nf*** "feeble" and *g**nf*** "floppy" affirms the roll of /n/ as intensifier of effect. The closeness of contact is intensified to produce the sense of "stiffness and tightness" in /t'n_/ roots: *t'**n**z* "tough, hard" and *t'**n**k'r* "wedge".

/r/ "stirring motion (force)"

The stirring force of /r/ is realized as "cracking, opening" in /k'r_/, /br_/, /fr_/, /_rk'/, and /_rg/ roots: *k'**r**s* "tear off", *k'**r**f* "peel", *b**r**gd* "fling a door", *b**r**k'* "lightening, thunder", ***fr**s* "fall apart", ***fr**t'* "burst", *d**r**k'* "dry", *z**r**g* "stretch". It becomes "tightening and jamming" with /t'r_/ and /_k'r/, roots: *t'**r**f* "tigh up, bundle", *t'**r**g* "swipe", *snk'**r*** "bolt", *t'nk'**r*** "wedge". At the final position of roots /r/ seems to add vigor to the effect of the root meaning as can be observed in /_dr/, /_gr/, /_t'r/, and /_fr/ roots: *wd**r*** "drive stake into the ground", *md**r*** "hold onto the ground",

*fg**r*** “paw the ground”, *dng**r*** “fix onto the ground”, *sbt’**r*** “variegate”, *k’t’**r*** “count”, *s**fr*** “fill up space”, *d**fr*** “face up”.

/s/ “Ease and softness”

Even if /s/ is represented by relatively fewer sample etymons as determined by the consonant pairs; its semantics is transparent enough from the available samples. Sharp and smooth motion is the characteristic meaning of /s/. Depending on the dynamics of the semantics of other consonants in a root the ease and sharpness of motion are observable in /sl_/ and /sn_/ roots: ***s**lk’* “grind finer”, ***s**lk* “creep”, ***s**nk’r* “bar, bolt”, and ***s**nt’k’* “split up, cleave”

/t’/ “Close, tight, stress/ tension (attach/ detach)”

/t’/ signals tightness of form or closeness of contact as felt in attaching and detaching. The sense of “tightness” is at the forefront in /t’r_/ and /t’n_/ roots: ***t’**rf* “tie up, bundle”, ***t’**rg* “swipe”, ***t’**nk’r* “wedge”, ***t’**nk’* “hold tight”. Even where “separation” is the central meaning as in *sb**t’**r* “variegate”, *k’**t’**r* “count”, *sn**t’**k’* “split up, cleave”, and *mn**t’**k’* “snatch” /t’/ indicates the “tightness” of bond at the point of departure. The “slippery” in /_lt’/ roots: *k’l**t’*** “melt, liquefy”, *bl**t’*** “surpass” and the “shrinking” in /_mt’/ roots: *dm**t’*** “crash flat”, *lm**t’*** “bend” are predicated on close contact and tightness. There is a sense of detaching when the inner or underside of things is exposed in /_bt’/ roots: *glb**t’*** “overturn”, *gb**t’*** “bend”.

4.5 The phono-semantic structure and its dynamics

The generalized semantics of the sub-morphemic pairs and individual consonants presented in the preceding section suggest that the connotation of a root is founded on the sequential reading of the semantics of its radicals. Further, the individual consonants show some semantic variation relative to their position in the root and relative to the co-occurring consonants. The

positional variations of the semantics of the sample phonemes are briefly described with some examples in **TABLE 5** below.

The positional and co-occurrence semantic variations of the consonants suggest syntagmatic relations between the radicals of a root not only as phonetic materials but also as bearers of meaning. The subtle semantic variations of a single consonant roughly correspond to the semantics of initiation, progression, and outcome of an event at initial, medial (second and/or penult) and final radical positions, respectively.

The co-occurrence variations are also consistent with the force dynamics of the preceding and/or following consonants. The characteristic semantics of a phoneme may be less transparent due to the interplay with the co-occurring phonemes. The initial position seems to be the best place for the phonemes to display their characteristic semantics without much influence from co-occurring phonemes. The semantics of a consonant at medial position is fuzzier unless analyzed in connection with an initial or a final consonant as a pair of high frequency. The final consonant fits into the semantics of a root as setting the state of inertia to the outcome of the whole dynamics.

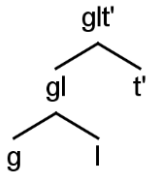
Except for some sporadic cases of metatheses[19], there seem to be strict ordering of the radicals in the root. Roots of the same set of consonants in different order such as *t'rg* "swipe", *rgt'* "stomp", and *grt'* "impede" have not only different lexical meanings, but also different phono-semantics. By virtue of being composed of the same consonants all of the roots carry the "closeness, tightness" of /t'/, the "stirring motion/force" of /r/, and the "push/pull force" of /g/. However, those roots are phono-semantically different because of the order of the consonants.

[19] Leslau (1995) notes the sporadic nature of metathesis in Amharic. It is particularly rare to find metathesis in productive roots other than in borrowed forms.

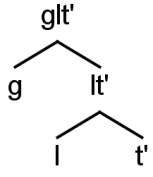
The significance of order in the phono-semantic construction is also evident in recurring sub-morphemic pairs. For example, the sequential semantics of /lg/ in /_lg/ "lax, vicious" or /lg_/ "stretching and extending with some sense of stickiness and elasticity" (see section 4.3 above) is somehow consistent for the pair at initial and final positions of a root. However, the reversal of the consonants into /gl/ brings a major shift of meaning with generalized semantics of "expose; separate". Given the sequential reading of the semantics of the consonants in a root, one may wonder whether the radicals are hierarchically structured.

A hierarchical organization of a root of three consonants such as *glt'* would either be like (26)a where /g/ and /l/ first constitute /gl_/ and then the pair merge with /t'/, or like (26)b where /l/ and /t'/ first constitute /_lt'/ and then merge with /g/. The presence of hierarchical structure of the radicals would imply different interpretations for the two possible structures leading to a phono-semantic homonymy/homophony, which doesn't seem to be the case. Phono-semantic homonymy/homophony is theoretically impossible, since a root as a phono-semantic base subsumes all the lexical and grammatical variants of the same set of ordered consonants. Therefore, it can be concluded that the organization of the consonants in a root is linear.

(26) a.



b.



The prevalence of phono-semantic association among certain recurring pairs of consonants and the semantic consistency of those pairs, in other words, the bi-consonantal tendency of the phonaesthemes, seem to be influenced by the strong presence of independent bi-consonantal etymons and root forming processes involving two consonants such as total reduplication and Unseth's (2002) BCR.

Phoneme	Initial position	Medial (second or penult)	Final
/b/	release of already built up pressure	transitional build-up of pressure	containing of pressure or mass
i)	***b****k'l* "sprout, germinate"	*l****b****s* "close, cover"	*lg****b*** "patch, mend"
ii)	***b****lt'* "surpass"	*s****b****r* "break"	*md****b*** "bed, base"
iii)	***b****rk'* "lighten, thunder"	*k'****b****t'* "leap; swell up"	*dl****b*** "store, amass"
iv)	***b****t's* "break, snap string	*d****b****r* "stack up"	*k't'****b*** "lay aside, save"
/d/	weight and density as force or resistance	shifting of a mass	gravitation, descent and landing
i)	***d****rb* "overlay"	*l****d****f* "drop large mass"	*lb****d*** "press down"
ii)	***d****bs* "fade, efface"	*g****d****b* "dam, dike"	*ng****d*** "descend"
iii)	***d****fk'* "dip, dunk"	*n****d****l* "bore, sluice"	*rb****d*** "sink, subside"
iv)	***d****ngt'* "startle"	*gn****d****s* "cut down"	*gb****d*** "cut big"
/f/	presence of internal motion or turbulence which leads to leakage or explosion	the initiation of such motion from the force in the previous consonant	weakening and lack of energy from escape or leak
i)	***f****lk'* "gush out, flash"	*l****f****s* "pliant; exhausted"	*ld****f*** "drop large lump"
ii)	***f****rs* "fall apart, collapse"	*s****f****r* "fill up space"	*sn****f*** "lazy, feeble"
iii)	***f****nd* "explode, burst"	*k'****f****r* "dig, excavate"	*grd****f*** "pound, grind coarsely"
iv)	***f****t'n* "hasten, prompt"	*gn****f****l* "boil over, flow over"	*t'l****f*** "entangle, trip up"
/g/	a moving force (which may be boosted or resisted by the semantics of the subsequent consonant)	impact of a moving force	extended movement (may be because the moving force is a final outcome that is not blocked by any consonant)
i)	***g****lt'* "disclose, expose"	*l****g****m* "work slowly"	*sr****g*** "percolate, sink into"
ii)	***g****ms* "divide, cleave"	*s****g****d* "bow down"	*tr****g*** "swipe"
iii)	***g****rd* "screen, curtain"	*b****g****r* "give in, yield"	*fl****g*** "track, search"
iv)	***g****bd* "cut big"	*dn****g****t'* "startle"	*mnd****g*** "pull out, draw out"
/k'/	transition or change of state	breaking or emergence of new event	opening, exposure
i)	***k'****lt'* "melt"	*b****k'****l* "sprout, germinate"	*sl****k'*** "grind finer"
ii)	***k'****mt'* "sit down"	*n****k'****s* "comb, pick"	*br****k'*** "lightening, thunder"
iii)	***k'****dm* "first, ahead"	*t'****k'****r* "darken"	*snt'****k'*** "split up, cut wide"
iv)	***k'****sr* "erect"	*fn****k'****l* "pry up"	*dn****k'*** "astonish"
/l/	weakness or inconsistency of form and structure	smooth and easy transition	suspend, fragment
i)	***l****sk'* "straighten, flatten"	*k'****l****t'* "melt"	*nk'****l*** "pull out"
ii)	***l****mt'* "bend; masticate"	*m****l****s* "turn, back"	*k't'****l*** "join, connect"
iii)	***l****fs* "flabby, soft"	*f****l****g* "track, search"	*gd****l*** "kill, eliminate"
iv)	***l****t'k'* "stick, fasten together"	*s****l****t'n* "skillful, trained"	*fnk'****l*** "pry up"
/m/	handle, control	intensity of contact	end, close
i)	***m****rt'* "select, pick out"	*l****m****t'* "bend"	*k'd****m*** "first, ahead"
ii)	***m****ls* "turn back"	*r****m****d* "trample, tread"	*ks****m*** "dry up, disappear"
iii)	***m****rg* "pelt, daub"	*t'****m****z* "wring out, twist"	*gt'****m*** "fit, join together"
iv)	***m****nk'r* "disarrange; break up"	*d****m****t'* "express, flatten"	*drg****m*** "put out, extinguish"

TABLE 5: The sound-meaning association of the consonants by position

Phoneme	Initial position	Medial (second or penult)	Final
/n/	intensity	intensity	intensity
i)	***n****k'l* "pull out, uproot"	*s**n**t'k'* "split up, cut wide"	*lm**n*** "entreat, beseech"
ii)	***n****ks* "bite, grit"	*g**n**t'l* "rip off, tear out"	*k't'**n*** "thin, slim"
iii)	***n****df* "sting, bite"	*d**n**gt'* "startle"	*bd**n*** "lifeless, numb"
iv)	***n****fr* "boil, seethe"	*f**n**d* "explode"	*sf**n*** "prevail, dominate"
/r/	at once, completely	crack through, break	stand firm, distinct
i)	***r****gf* "fall into pieces"	*m**r**t'* "select, pick out"	*md**r*** "push against the ground
ii)	***r****md* "trample, tread"	*g**r**d* "screen, curtain"	*t'm**r*** "put together"
iii)	***r****ks* "imure, defiled"	*f**r**s* "fall apart, collaps"	*sf**r*** "fill up space"
iv)	***r****t'b* "wet, damp, moist"	*k'**r**t'f* "cut off, chop"	*t'nk**r*** "strong, vigorous"
/s/	easy and free movement	uninterrupted transition	weaken, soften
i)	***s****lk* "creep, move sleek"	*k**s**m* "dry up, disappear"	*bl**s*** "discolor"
ii)	***s****mr* "straight, aligned"	*bs**l*** "cook, ripe"	*fr**s*** "fall apart, collapse"
iii)	***s****fn* "prevail, dominate"	*ms**l*** "seem, simulate"	*k'n**s*** "reduce, diminish"
iv)	***s****nt'k'* "split up, cut wide"	*g**s**b* "drink heavily"	*gnd**s*** "cut down"
/t'/	tighten, toughen	attach/detach	assuming form or identity
i)	***t'****lf* "trip up, tangle"	*l**t'**f* "stick, paste"	*fl**t'*** "split, cleave"
ii)	***t'****mr* "put together"	*k'**t'**l* "join, connect"	*k'l**t'*** "melt, liquefy"
iii)	***t'****nkr* "strong, vigorous"	*n**t'**k'* "snatch away"	*mr**t'*** "select, pick"
iv)	***t'****fr* "bind, fasten"	*g**t'**m* "fit, join together"	*k'lb**t'*** "small"

TABLE 5: (continued)

4.6 Conclusion

It can be generalized and proposed from the above discussion that the pairs of consonants shared at the edges of the etymons, and in the final analysis the shared individual consonants, semantically unify all the derivatives of those etymons. Of course, as the degree of semantic abstraction increases toward the phoneme, transparency of the semantic relation between the lexical items decreases. Therefore, as exemplified with the sample expressions in groups containing larger number of etymons the points of semantic connections with less prominent aspects of meanings need to be amplified. However, saving possible minor distortions in the translation, all the semantic descriptions are based on lexicologically and intuitively available meanings of the actual words. The reality of the semantic characterization of the sub-morphemic units will be verified with the test of intuition of the native speakers which will be discussed in the next chapter.

CHAPTER 5:

RESULTS FROM THE EXPERIMENT

5.1 Introduction

As documented and discussed in Chapter 4, the sound-meaning correspondence of the data extracted from the dictionary is beyond chance occurrence or a mere coincidence. The interpretations of these facts, however, could be perceived as the perspective of only one native speaker of the language who happens to be also the researcher. To preclude this possibility, an experiment was designed to test the intuitions of other native Amharic speakers in an attempt to ascertain the accuracy of the generalizations resulting from the textual analysis of the database. If the findings from the experiment were congruent with those from the database, this congruence would substantiate the initial findings and hypothesis discussed in Chapter 4; if they are not, then those findings would be seriously questioned.

In the first two sections the design and administration of the questionnaire and the score distribution of the subjects' responses are described to provide a general picture of the experiment. In section 5.3 the test-statistic results of the scores are discussed to interpret the overall results of the experiment.

5.2 Design and administration of the questionnaire

The important question at this stage is whether the semantic characterization of the 11 sample consonants given in the previous chapter is a reality in the minds of the native speakers of Amharic. If the semantic characterization of the consonats has psychological reality, then we assume that native speakers would demonstrate some consistency in utilizing their intuition about the sound-meaning association to guess the meanings of new roots in their language. The expected consistency should be a success rate that is better than random.

To address the above question, 11 pairs of non-duplicating tri- and quadri-consonantal nonsense roots/words were created, with each containing as a target of investigation one instance of the 11 sample consonants studied in the textual data analysis. The nonsense words were composed mainly of the 11 sample consonants in accordance with the known co-occurrence restrictions of Amharic. To test if the subjects can consistently associate the target consonants in those nonsense roots/words with their predicted semantic descriptions, two sets of questions were prepared. In the first set semantic descriptions of the target consonants were stated in simple expressions followed by four alternative answers of tri-consonantal nonsense roots/words, including one that contains the target consonant. The general instructions directed the subjects to indicate their choice of the most suitable root/ word to the given semantic description, if the provided options were to be real Amharic words. The alternatives intended to be distractors were created in a similar fashion as the target nonsense roots/words, except that the distractors did not carry the particular target consonants.

The questions in the second set each provide a quadri-consonantal nonsense root/ word followed by four alternative semantic descriptions of the sample consonants of which only one matches the predicted semantics of the target consonant in the given nonsense root/ word. The general instructions directed the subjects to assume the given word as if it were a real Amharic word, and to select the semantic description that best suites that word.

In order to make the questionnaire interesting, transparent, and relatively compact to complete, a number of factors had to be taken into consideration in its construction. First, to let the subjects freely associate the nonsense roots/words without any bias, the roots/words were formed without clues that could easily lead to the intended answers such as containing sequences of consonants that are parts of some common words that have affinity to the designated

semantics of the target consonant. For example, providing an alternative with initial sequence of /g/ and /t'/ in a question that targets the first consonant which has a designated semantic description of "A force of collision or secession" would more or less give away the answer, since the immediate word that comes to mind with that initial sequence *gät't'ämä* implies a force of collision. Also the descriptions of the consonants in the nonsense roots/words were composed carefully as much as possible to avoid expressions that match any sequences in the target roots/words. However, it was not possible to completely sanitize the descriptions from containing expressions with the target consonants. Such an effort would deter the choice of expressions for closer semantic descriptions.

Second, the semantic descriptions of the target consonants were constructed in such a way that the subjects could visualize the abstract concepts in terms of aspects of some common events. For example, instead of giving the generalized abstract semantic description "build-up or release of pressure, opening, out" to match with a potential root/word that contains /b/, the following description was given in the questionnaire: "a closed or suppressed force that pushes to come out". It was believed that this approach would enable the respondents to imagine any kind of situation in which they could sense a build-up or forceful release of pressure to associate with a root/word which they intuitively feel represents the concept.

Third, the number of questions had to be limited so that the subjects would not get bored of trying too long to make sense of something which is apparently nonsense and in the process lose focus. Also if the whole process of completing and submitting the questionnaire should take more time than the subjects could willingly spend, there was the risk of receiving insufficient responses for the study. Further, bi-consonantal roots have been excluded in the test for the following reasons: actual bi-consonantal roots make over 58% of all the possible pairs that can

be formed in pairwise permutation of the 24 consonantal phonemes without even considering co-occurrence restrictions. In fact, almost all the possible pairs that can be formed out of the 11 sample consonants are already active bi-consonantal roots. This allows little room to create a new potential bi-consonantal root in which the semantics of a consonant can be tested. Nonetheless, the two sets of questions that are based on tri- and quadri-consonantal roots are believed to be well measured to collect enough information to conduct an initial test of the native speakers' intuitions in the language with regard to the sample consonants without demanding too much of their time and effort.

In addition to the above factors, the following criteria were deemed necessary in the selection of subjects for the survey. 1) Being a native speaker of Amharic; 2) having access and the skills to use computer and Internet tools, especially exchanging emails; 3) having completed at least secondary education. An email address list of over 200 potential participants was prepared from the researcher's address book and lists supplied by the researcher's friends and relatives. The questionnaire was prepared in the Amharic language in a fillable PDF form in which the participants could fill in some text fields, select some responses from lists under dropdown buttons to enter personal information such as acquisition and use of the language, and place check marks in boxes in front of selected alternatives to answer the questions. The questionnaire was distributed as an email attachment with a solicitation message and simple instructions on how to complete and submit the form.

The researcher had hoped to receive about a hundred acceptable responses within 4 weeks. With repeated reminders and follow ups, 104 responses were received. They were subsequently organized onto an Excel spreadsheet and analyzed. A chi-square test was run on SPSS statistical software to determine the goodness-of-fit. The descriptive statistics of the scores from the

questionnaire are reported in sections 5.3 below and the test-statistic results are discussed in section 5.4.

5.3 The results

The following is a statistical description of the raw scores received from the responses for the questionnaire. The description presents the overall picture of the aggregate score and also compares the scores for the two sets of questions as well as for the individual question items to highlight the relative consistency of the responses against the general trend. The score distribution for each target consonant and for each question item and option is given in **TABLE 6**.

Target	Quest. Item	Option #1	Option #2	Option #3	Option #4	Response Total	Success/ Quest.	Success/ Target
r	1	10	**62**	28	4	104	59.62%	69.23%
	12	13	**82**	3	6	104	78.85%	
n	2	21	37	29	**17**	104	16.35%	37.98%
	13	10	12	**62**	20	104	59.62%	
l	3	21	8	**64**	11	104	61.54%	42.31%
	14	37	**24**	24	19	104	23.08%	
m	4	4	5	9	**85**	103	82.52%	71.07%
	15	**62**	19	17	6	104	59.62%	
g	5	22	**41**	28	10	101	40.59%	40.49%
	16	5	46	**42**	11	104	40.38%	
k'	6	20	13	35	**36**	104	34.62%	39.90%
	17	**47**	7	16	34	104	45.19%	
b	7	28	3	35	**38**	104	33.65%	35.10%
	18	42	**38**	15	9	104	36.54%	
f	8	18	**74**	9	3	104	71.15%	63.46%
	19	38	2	6	**58**	104	55.77%	
t'	9	**51**	4	28	21	104	49.04%	58.50%
	20	10	7	**70**	16	103	67.96%	
s	10	35	7	**52**	10	104	50.00%	41.35%
	21	17	**34**	26	27	104	32.69%	
d	11	**74**	5	16	9	104	71.15%	56.25%
	22	**43**	17	17	27	104	41.35%	

TABLE 6: Score distribution and success rate of the responses to the questionnaire (targets are underscored and are in bald face)

The 104 respondents scored at an overall average success rate of 50.5% in a range of 18 – 82% with a standard deviation of 0.124 (see the frequency distribution chart of the scores in **FIGURE 2** below). 46% of the respondents scored above the average; 92% rising above the statistical significance threshold of 34.66% set at a confidence level of 95% (see section 5.4 for the discussion of the results of the test-statistics). Overall the sample consonants were matched as intended to the designated semantic descriptions in the frequency range of 37 – 71%. The first set of questions was answered at 52% success rate and the second set at 49% success rate at standard deviations of 0.194 and 0.165, respectively.

Although the overall score distribution and the statistical test results are very positive, some deviant scores have also been observed even among those positively evaluated question items in the test-statistics. Three consonants /n/, /l/, and /d/ received the most inconsistent scores between the two sets of questions (see section 5.4 for the explanation of those inconsistencies). The total score of 16% for /n/ in the first set of questions is the lowest of all. However, in the second set the same consonant received 60% for a combined average of 38%. The score of 62% for /l/ in the first set went down to 23% in the second set pushing the semantically most transparent consonant closer to being a statistical outlier if not for its 42% combined average. On the higher side of score irregularity we find /d/ receiving 71% in the first set and 41% in the second set. The most consistent scores in the two sets of questions came in the lower end of the chart from /b/, /g/, and /k'/ (see **FIGURE 3** below). /b/ has 37% in both sets of questions. /g/ received 39% and 40%. The 35% and 45% scores for /k'/ are not wide apart either. Another semantically very transparent consonant almost relegated to a statistical outlier position is /s/ which received 50% in the first set and 32.6% in the second set. Yet again it's combined average score 41% is statistically significant. The highest scores of /m/ 82% and /f/ as well as /d/, each at 71% all in

the first set of questions, and the 79% score of /r/ in the second set of questions are among the notables.

The responses to the two sets of questions were submitted to Pearson's Chi-square test for goodness-of-fit[20] first separately and then in combination to determine whether the success of sound-meaning matching out of four items depended merely on probability as would be presumed by the so-called first principle of linguistics, which makes our null hypothesis, or whether the accuracy of matches depended on something other than probability, which is a rejection of the null hypothesis and the upholding of the hypothesis of the current research (see **TABLE 7**-9 below for the test results and section 5.4 for the interpretation of the results) The test which determines the evenness of distribution of the responses based on 25% probability for each alternative answer (**TABLE 7**) indicated that 20 out of the 22 questions registered asymptotic significance of less than 0.05, the predetermined standard of significance (p-value), to be ruled unfit for random distribution. Questions #14 (target /l/) and #21 (target /s/) were evaluated as fitting the random distribution pattern in this particular test registering asymptotic significance of 0.08 and 0.13, respectively. Similar results were found in the test which determines whether the observed selection of a single intended answer among three unintended alternatives conforms to the two-way (success/failure) 25:75 probability distribution of the expected outcome (TABLE 8). Again, the 20 questions were ruled unfit, whereas questions #14 and #21 registered asymptotic significance of 0.65 and 0.07 to be evaluated as conforming to the expected outcome. The test which combines the two sets of questions for a three-way probability of getting all success,

[20] Pearson's chi-square test for goodness-of-fit evaluates whether outcome frequencies follow a specified distribution. Accordingly, our intention was to find out whether the selection of one intended answer out of four alternative answers for each question item (i.e., our observed outcome frequency) fit the probability distribution of random selection (i.e., the expected outcome). Positive result in this test would uphold the null-hypothesis which predicts the relation between sound and meaning is arbitrary, therefore, in our experiment the subjects' selection of the answers would reflect the probability distribution of random selection.

success/failure, or all failure answers in 6.2: 37.5: 56:25 ratio indicated that the expected outcome was significantly upset with the 11 pairs of questions registering asymptotic significance of well below 0.05 (TABLE 9).

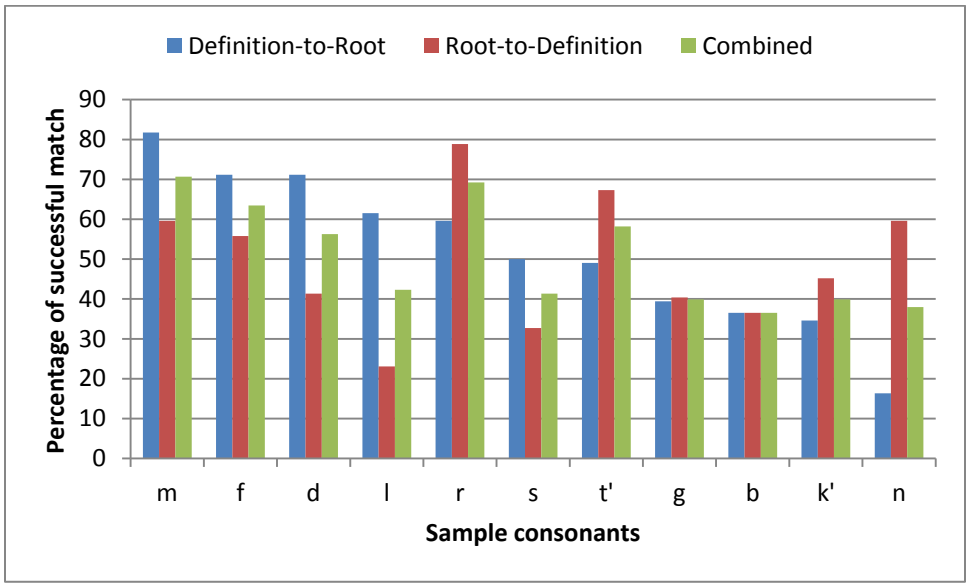


FIGURE 2: Distribution of successful responses to the test questions

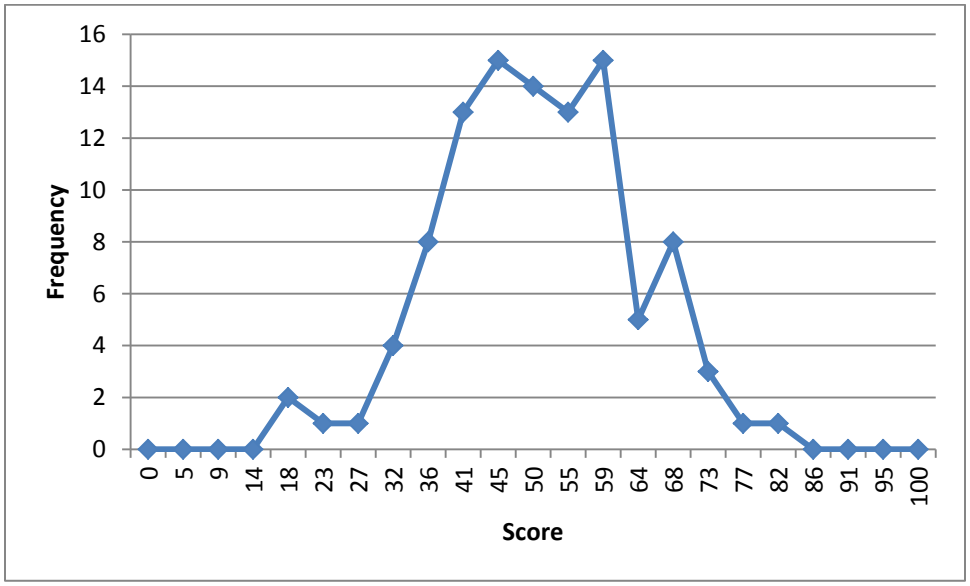


FIGURE 3: Percentage of successful responses for each sample consonant

	Q1 /r/	Q2 /n/	Q3 /l/	Q4 /m/	Q5 /g/	Q6 /k'/	Q7 /b/	Q8 /f/	Q9 /t'/	Q10 /s/	Q11 /d/
Chi-Square	78.46	9.08	77.62	182.32	19.75	14.85	29.15	122.54	43.77	52.85	120.54
df	3	3	3	3	3	3	3	3	3	3	3
Asymp. Sig.	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Q12 /r/	Q13 /n/	Q14 /l/	Q15 /m/	Q16 /g/	Q17 /k'/	Q18 /b/	Q19 /f/	Q20 /t'/	Q21 /s/	Q22 /d/
Chi-Square	162.85	68.62	6.85	70.23	50.85	37.15	31.15	82.46	103.02	5.62	16.26
df	3	3	3	3	3	3	3	3	3	3	3
Asymp. Sig.	0	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.00

TABLE 7: Test statistics for even distribution (25:25:25:25)

	Corr_1	Corr_2	Corr_3	Corr_4	Corr_5	Corr_6	Corr_7	Corr_8	Corr_9	Corr_10	Corr_11
Chi-Square	66.46	4.15	74.05	181.78	13.1	5.13	7.38	118.15	32.05	34.67	118.15
df	1	1	1	1	1	1	1	1	1	1	1
Asymp. Sig.	0.00	0.04	0.00	0.00	0.00	0.02	0.01	0.00	0.00	0.00	0.00
	Corr_12	Corr_13	Corr_14	Corr_15	Corr_16	Corr_17	Corr_18	Corr_19	Corr_20	Corr_21	Corr_22
Chi-Square	160.82	66.46	0.21	66.46	13.13	22.62	7.38	52.51	101.39	3.28	13.67
df	1	1	1	1	1	1	1	1	1	1	1
Asymp. Sig.	0	0	0.65	0	0	0	0.01	0	0	0.07	0

TABLE 8: Test statistics for single successful answer (25:75)

	Comb_1	Comb_2	Comb_3	Comb_4	Comb_5	Comb_6	Comb_7	Comb_8	Comb_9	Comb_10	Comb_11
Chi-Square	321.03	23.63	33.85	349.17	25.07	26.71	15.38	238.56	194.3	32.1	135.18
df	2	2	2	2	2	2	2	2	2	2	2
Asymp. Sig.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TABLE 9**:** Test statistics for combined successful answer (6.25:37.5:56.25)

5.4 Discussion of the results

Our expectation in the experiment was to confirm that the sound-meaning correspondences in Amharic as presented in the previous chapter are not outcomes of chance occurrence. Overall, the frequency distribution of the scores and the statistical test results indicate that our study is in the right direction towards finding the desired outcomes. The fact that 92% of the score distribution is above 34.66%, the maximum that could be achieved if matching the right definitions to the apparently nonsense roots/words had been a mere chance exercise, is an overwhelmingly positive result that confirms our experiment has met its goal. Also, the fact that 20 out of 22 questions have been proven to stand the multiple tests of goodness-of-fit indicates that the design of the experiment was good enough for an initial attempt to provide a much needed empirical support for the investigation that lacks theoretical background in many aspects. However, some of the irregularities observed in the distribution of scores and in the statistical test results need to be addressed.

Comparing the two sets of questions as wholes, the first set received an average score of 52% against the 49% of the second set. Also the two undesirable results in the Chi-square goodness-of-fit tests came from the second set of questions. The relatively lower average score and the undesirable test results in the second set of questions can be partly attributed to the higher information load in quadri-consonantal roots as well as in the multiple definitions that the subjects have to choose from compared to the single definition and multiple tri-consonantal roots in the first set. The time and effort required to process the extra information may have negatively affected the success of responses in the second set of questions.

When we consider the specific results it is quite puzzling that the two consonants of high frequency of occurrence in roots with apparently very sound and transparent semantics, namely,

/l/ and /n/ received such not-so-impressive scores from the respondents and were marginalized by the statistical tests. As noted in the previous section beside the fluctuation from the score of 62% in the first set of questions to 23%, in the second set the Chi-square goodness-of-fit test evaluated the distribution of responses for /l/ as not statistically significantly different from random distribution with p-values of 0.08 and 0.65 in the two separate tests. By looking at how the Chi-square test evaluated the raw scores and by going back to the setup of the questions we may be able to see the source of the anomaly. The Chi-square test evaluated the 37:24:24:19 observed actual score distribution among the alternatives and judged that the distribution is about even that there is no large enough inclination toward a single alternative (ideally the intended answer) to rule out a mere chance selection of that alternative.

So, what led to such open-for-chance kind of score distribution? Going back to the questionnaire, the first thing that can be observed in the setup of the question for /l/ in the second set is that the consonant is not in its optimal place of 2nd position in a quadri-consonantal root *mslk'*. Secondly, the distractor items to the intended answer appear to have nuances that are likely to be associated with one or more of the co-occurring consonants. Particularly, the "grip, control" sense of /m/ alone or combined with the "ease of movement" sense of /s/ may have created the illusion of "pressure" in some of the many respondents who were attracted toward alternatives #1 "suppressed force" and #3 "pressing down, gravitating force". It should be noted here that despite its disqualification in the Chi-square goodness-of-fit test due to the score it received in the second set of the questions, its score in the first set of the questions (62%) and in the combined average (42%) doesn't place it too far below the threshold set at a relatively high standard of (level of) confidence, i.e. 95%.

Although the score distribution of /n/ marginally escaped from being judged as undesirable by the Chi-square test, it still remains a statistical outlier for its lowest score of 16% which was only raised to an average of 38% by the score it received in the second set of questions. /n/ appears to have the same connotation in all positions (see **TABLE 5**), however, the optimal position in the root for its semantics seems to be the medial position as can be inferred from its disproportionately high occurrence of 39% at 2nd position with quadri-consonantal roots compared to all other consonants, and from the 60% success rate of response it received on a question based on that same position in the second set. The initial position where it occurred in the first question may have undermined its typical semantics of "intensity of force".

Why didn't /d/ maintain the high score it garnered in the first set of questions? The reason for the discrepancy could be that in the first question the target consonant is found at the final position of the root *zb**d*** where the designated semantics of "gravitation, descent and landing" particularly makes commonsense, whereas in the second question the medial position of the consonant in the root *zn**d**f* better suits the sense of "shift of a mass" which swayed a good number of the respondents (26%) to choose alternative definition item #4: "easily slipping or stretching" which was intended to be a distractor not a target. However, given the general trend the 41% average score is not too low.

Another intriguing outcome was the disqualification of /s/ on the second question in the two separate tests of Chi-square goodness-of-fit. It was noted only after the responses have been collected that alternative items #1 and #4 in the failed question were slightly modified statements of the same idea. Although the two alternatives were intended to be distractors, the fact that their meanings could not be clearly differentiated may have been too much of a distraction for the already bored respondents toward the end of their test to affect their genuine intuitive judgment.

The exceptionally high score for /m/ in the first set of questions may be attributed to the presence of /t'/ in the target root/word *t'dm*. The generalized semantics of /t'/: "close, tight (attach/ detach)" may have reinforced the nuance of "grip, control" by infusing "strength" to the given semantic description of the target consonant: "tight grip or handling", thereby creating bias toward the root.

5.5 Conclusion

We have ascertained in the statistical tests that with the exception of two question items: #14 and #21, that the selection of intended answers for the remaining twenty questions by our subjects did not follow the pattern of random selection. At 95% confidence level and expected mean of 25% the maximum score that could be achieved under normal distribution is 34.66%. By that standard 92% of the responses were found to be over the range of random selection. Those statistically proven facts confirm that the sound-meaning correspondences as documented and described in Chapter 3 and as reflected in the experiment responses of our subjects are systematic.

CHAPTER 6:

CONCLUSIONS AND THEORETICAL IMPLICATIONS

6.1 Introduction

A number of independent Amharic roots, traditionally assumed to be basic meaningful units, were observed to have some semantic relations with one another along their corresponding shared consonants. We asked ourselves whether those sound-meaning correspondences occurred by historical accidents, as would be presumed by the first principle of structural linguistics (De Saussure 1959), or whether they are manifestations of a latent sub-morphemic arrangement as would be argued for by proponents of sound-symbolism. Even though in the mainstream linguistics the view of sound-symbolism is marginalized and at best controversial, the observed sound-meaning correspondences were too many to be sidelined as mere coincidences or historical accidents; therefore, we pursued the possibility that they could be outcomes of an underlying system.

The phonetic and semantic comparison of the Amharic roots and an experiment with native speakers' intuitions did prove our initial hypothesis. By summarizing our findings and by recounting the positions we took with regard to some critical theoretical issues, in this chapter we will discuss the implications and significance of the study. We will end this chapter with a few statements about the future directions in the study of the sub-morphological phenomena.

6.2 Conclusions:

The research for this study sought to ascertain the reality of sub-morphemic sound-meaning correspondences in Amharic, a Semitic language spoken in Ethiopia and used for centuries as the national official language of the state. The investigation carried out on the basis of a

comprehensive database of Amharic roots and an experiment involving native speakers has reached the following conclusions:

a) All the consonants of Amharic are associated with some semantic properties which they contribute to the computation of the basic meanings of lexical items.
b) There is a phono-semantic level of organization in the lexicon where the consonantal phonemes form the rudimentary lexical unit—the etymon.
c) The root is the outcome of a morphological transformation of the etymon.

6.2.1 All consonants are associated with certain semantic properties

After reducing the dictionary entries into their morphological bases (roots) the grouping and subgrouping of those roots by their corresponding pairs and individual consonants enabled us to gradually abstract the semantic properties of the individual phonemes based on the meanings shared by the roots that carry the corresponding phonemes. In the sound-meaning matching experiment in which 104 native speakers of Amharic participated, over 92% of the respondents scored above the threshold of 34.66%, which a statistical test determines only less than 5% would score higher if it were an exercise of a random choice. That was a confirmation that the relation between the sample consonants and the abstracted semantic properties have intuitive basis in the speakers' mind.

Based on the above generalization we can predict that the degree of semantic similarity between lexical items is directly related to the number of corresponding consonants they share. Consider example (27) below.

(27) Dictionary definitions of some s-initial verbs

a. *sälät't'änä*: to be or become skillful, able, efficient; to be or become trained, acculturated, become refined in one's manner of dress and/or speech; to become master of one's skill, know how to learn quickly or to do s.th.; to become famous, renowned; to become powerful, get the upper hand, prevail, overcome; to be authorized, empowered, be given authority to

govern or rule; to be ordained (priest); to be broken (ox to the yoke, beast of burden to the pack); to become acclimated (plant); to be shaped (pieces of wood) in order to fit together

b. *sällät'ä*: to be, become successful, turn out well, become acculturated, be polished, have good manners; to serve as a priest, take priestly orders; to be appointed to office; to finish (a task), use up (money) (KBT); to meddle in everyone's affairs, have a finger in every pie; to be quick; to be finished, completed; to be brought under control (district); to be settled (case)

c. *sälläk'ä:* to grind fine or finer, to regrind (all grains but teff); to crush, subjugate; to beat severely, thrash; to be very ill, to weaken s.o. (illness); to sing sweetly (däbtära-cantor)

d. *slla*: to be or become in good condition, to be good, turn out well, e.g. wät'-sauce, a banquet, to succeed, prosper; to percolate, seep through (water); to improve, become better (refractory ox or person through punishment); to speak better (one who was tongue-tied); to be decreased (angle of the plowshare so that it does not turn the soil); to be slender (neck — a sign of beauty); to move gently, warily, to stalk; to insinuate o.s. (into a conversation, etc.); to be or become sharp, have a keen edge

e. *sassa*: to be or become greedy, insatiable; to be or become stingy, selfish, or avaricious; to be fearful for, be solicitous for, be deeply concerned about; to be or become very fond (with lä); to be or become thin, to be threadbare (garment), to be or become thin, poor, sparse or patchy (sown field)

What we noticed here is that the semantics of "ease and simplicity" can be generalized for all the lexical items from the initial consonant /s/ that they share. Similarly, the semantics of "looseness and flexibility" characterizes the first four lexical items that share the consonant /l/. The first two items share the semantics of "tension of secession" for having the consonant /t'/ in common. The combination of those semantic properties roughly gives the core semantics of the verb *sällät'ä.*

6.2.2 The etymon as the sub-morphemic lexical unit

The generalization about the introduction of a sub-morphemic level of analysis was based on the pattern of variation of phonetically and semantically minimally differentiated roots. As

illustrated in sub-section 1.5.2.2 the semantic and phonetic relation between roots that are differentiated by duplication of radicals, or by the presence or absence of a glide feature is not a morphological relation of deriving one from the other; there is no morphological process of root formation. The most plausible way to account for the relation in light of the phono-semantic phenomena was to postulate a sub-morphemic level of analysis where the invariable elements make up the phono-semantic base of the related roots. The introduction of the sub-morphemic level of analysis not only solves the problem at hand, but also serves a crucial purpose in defining a level where all phono-semantic relations between lexical items take shape in the form of the etymon.

6.2.3 The root as a morphological unit

The separation of the etymon as the rudimentary lexical unit of phono-semantic composition spares the morphological component the burden of specifying lexical relations, real or apparent, between morphologically distinct units—roots. For example, despite their semantic relatedness *källa*, *källälä*, and *kälkkälä* or *k'ät't'ärä*, *k'^{w}ät't'ärä*, and *k'^{w}at't'rä* are all distinct roots that follow different patterns of derivation. Whereas the phono-semantic unity of the sets are represented by their respective etymons: *kl* and *k't'r*; their morphological divergence is represented by the roots. The transformation of the etymons into morphological units is phonetically marked by the augments reflected in their root forms.

6.3 Theoretical Implications

To compare the approach and the findings of the current study with related previous studies on sound-symbolism, the strong semantic relations between multi-consonantal roots upon sharing pairs of consonants at the edges show some resemblance to the phonaesthemic trends observed several decades back in English and other Indo-European languages (Firth 1964,

Householder 1946, Bolinger 1950; see also the discussion on sub-morphemics in section 3.3). To the extent that some frequently shared pairs of consonants determine the semantic relationship between multi-consonantal roots, Bohas' (2006) theory of bi-consonantal etymons appears to explain the relationship. However, since his theory denies the existence of tri- and quadri-consonantal etymons, phonetic extensions become necessary to form all the phono-semantic bases of tri- and quadri-consonantal roots. While this in itself is too much of an irregularity for a theory which is formulated to account for the formation of all roots, its failure to offer a systematic account of the process of augmentation of the extra consonants and their semantic effects makes it incomplete. In this regard our approach is a better alternative: it reduces sound-meaning association to the level of a single phoneme and also recognizes roots with a range of consonants to account for all kinds of root formations.

More specifically, the findings of the current research can be viewed as a substantiation of Unseth's (2002) initial observation about a possible pattern of link between the consonants of BCR roots and some categories of meaning in Amharic rather on all kinds of multi-consonantal roots. The findings indicated that such a pattern is not limited to BCR verbs: Instead, it encompasses all kinds of lexical items that are derived from roots. The present study also offers a better direction for the understanding of the nature and behavior of the echo-words of Amharic studied by Leslau (1961). Besides the suggested attenuation symbolism of reduplication as a cause for the general semantic tendency of the "acts and qualifications of uncomplimentary nature" expressed in the echo-words, actual symbolism of the sounds plays a major role. Since most of those expressions are formed by compounding actual or potential words/ stems they cannot be considered as reduplicative forms as such. The selection of maximally rhyming words/ stems that create the impression of reduplication suggests that the creators/ users of the echo-

words have phono-semantic intuitions about the components. It is useful to suggest here that in order to understand the phono-semantics of those contrastive units (in most cases onsets of initial syllables) comparing the semantics of the minimally contrasted components of the echo words is important.

In light of our findings which indicate the meaningfulness of all the consonants in a root, Bar-Lev's (2005/6) theory of 'initial single-segment sub-morphemes' appears to be too limited to explain the phono-semantic phenomena of Amharic. Contrary to his theory, our investigation indicates that the consonants manifest their inherent semantics wherever they occur in the root without being limited to the initial position. Our generalization seems to concur with that of Bar-Lev's at a point where the two views agree on the semantic prominence of the consonant at initial position of a root. From our point of view that outcome is due to the linear advantage that initial consonants enjoy by appearing before all others. Another point of difference is that Bar-Lev's theory limits phono-semantics to some selected consonants, whereas for us all consonants have phono-semantic functions.

The phono-semantic principle which states that all the consonants of an etymon must be unique in order to have semantic contributions corroborates Greenberg's (1950) monumental findings of the phonetic incompatibilities in Semitic roots not simply as phonotactic constraints on the root, but as phono-semantic constraints on the etymon. The restriction on homorganic sequences of consonants at initial and final positions of the etymon are imposed by the need for optimal phonetic contrast as well as distinct semantic contribution. The occurrence of identical consonants mainly in the final position[21] of surface lexical items appears to be contradicting the

[21] As indicated elsewhere in the discussion Amharic has some roots with reduplicated radicals at initial position such as *k'äk'k'älä* "cook by boiling", *däddärä* "harden", *g^{w}agg^{w}ärä* "bellow", etc.

phono-semantic restriction. However as Greenberg indicated the final consonant is not an original radical but an instance of final radical duplication. Our findings emphasize that the duplication occurs outside of the phono-semantic level.

If the proposed separation between the phono-semantic and the morphological analysis of lexical items is accepted, it will have a major theoretical and practical implication in the conception and analysis of the root in Semitic languages, in general and in Amharic, in particular. The phono-semantic level being a place where the consonants are concatenated to form the etymon, it will represent lexical relations of fundamentally phono-semantic nature. The morphological level is a place where etymons acquire grammatical function to enter into morphological derivation. Also root forming operations will be differentiated from stem forming ones. For example, root-forming reduplication such as {*kl*: *källa* "hinder", *källälä* "fence in", *käläkkälä* "prohibit"} will take place at the phono-semantic level, whereas stem forming reduplication such as {*dbs*: *dabbäsä* "grope", *däbabbäsä* "groom", *-dbäsbbäsä* "cover up"} will take place at the morphological level. The viability of this distinction can be observed from the fact that the elements in the first set can undergo the next level stem-forming reduplication[22].

Another theoretical implication of our findings is in the determination of the phonemic status of some element. Particularly in Amharic, the analysis of the glide features as augmentative elements in root formation necessitates a revision of the phonemic system of the language with regard to the elements identified with those features, namely, the palato-alveolar consonants, the labialized velars, and the peripheral vowels. As indicated in the theoretical framework section of

[22] The quadru-radical member is an exception for the stem-forming reduplication, perhaps because the form has already undergone total reduplication.

the introductory chapter our position for a more plausible analysis in this regard is recognizing those features as independent phonemes and simplifying the remaining inventory accordingly.

The bridging of the gap between diachrony and synchrony is yet another important theoretical implication of this study. The etymon which was by and large viewed as the historical root of lexical items with divergent synchronic morphology has now been connected to the synchronic root via a process of transformation. Besides strengthening the generalization that sound-symbolism is a living feature of a language than it is a historical relic, this connection may also open a possibility of phono-semantic explanations for some otherwise unexplained phenomena, e.g., certain sound changes. Note in this regard Malkiel's (1990) remark about the significance of sound-symbolism in explaining some sound changes:

> [I]n addition to crude imitation of speech-external events (thunder, animal's roar or barking, etc.), there exists a special category of sound changes – a class large or small or reduced to zero, depending on the language placed under the observer's lens and on the particular stage of its growth focused upon – which lend themselves to neat segregation from the bulk of normal, ideally regular sound changes; wherever warranted, they may be subsumed under some such label as "phonosymbolically-colored shifts". And … these shifts … have vigorously interacted with the mainstream of events: The phonetic "laws" peculiar to the locus and the period; the timelessly valid general phonetic "accidents"; the pressures of the paradigm and the aggregate of lexical attractions and repulsions; the bundle of phenomena conventionally bracketed as effects of diffusion; the social filtering, through processes such as taboo, hypercorrection, excessive self-assertion; the channeling of the material transmitted through various competing conduits (vernacular, semi-learned, and the like). Only this integrated approaches, unavailable as long as expressivity was indiscriminately being equated with all sorts of *Schall-* and *Lallwörtter*, or murky *Urshöpfungen*, promises to make this newly staked-out field truly promising. (35-6)

For example, the existence of forms in Amharic with alveolar vs palatal variation without the phonetic conditioning to explain the sound change as in *t'lm* vs *č'lm*, *sfn* vs *šfn*, *lsk'* vs *lšk'*, etc. is a typical problem that can be rescued by phono-semantic considerations. As already argued for in Chapter 2 assigning phonemic status to the palatal feature together with other glide features

and assuming augmentation of etymons with those features as a process of root formation can explain the sound change as an outcome of a phono-semantic process.

The utmost significance of the present study for linguistics in general is the evidence it contributes toward building a stronger case for the study of sound-symbolism. Derived from a comprehensive data and validated by the experiment on the intuition of the native speakers as confirmed by the overwhelmingly positive test-statistic evaluations, the findings of our study warrant the rejection of the hypothesis that the relationship between sound and meaning is arbitrary. With the possibility of extensive analysis of sub-morphemic sound-meaning associations in languages we will have a better understanding of how they function.

Establishing valid connections between seemingly unrelated expressions at the phono-semantic level facilitates the identification of deeper semantic relations which is particularly advantageous for various lexicological studies and practices. It reinvigorates etymological study by offering more scientific tools to determine the evolution of lexical items. Lexicography will also gain more scientific basis to identify the contextual factors of semantic divergence and describe current usage of lexical items while neatly delineating their core meanings and highlighting the connections with other lexical items. Such a deeper level form and meaning connection will lay down essential infrastructure for the development of terminology and web-based semantic networking projects. The fields of literature and language education can also exploit those connections to their purposes of understanding and enrichment of language use.

6.4 Future Research Directions

Our research based on 11 out of the 18 (+6 palatal) consonants of the Amharic language has demonstrated that the phono-semantic values of the consonants can somehow be enumerated in

terms of dominant semantic properties of the individual consonants. Further research may take on the remaining consonants to complete the semantic profiling of the Amharic consonants to paint a fuller picture of the phenomena. The methodology used in this research can also be improved and replicated by studying similar phenomena in other Semitic languages, particularly Ethio-Semitic languages which share a number of similar grammatical and lexical features. In this regard the effort to analyze the semantic similarities and differences between lexical items at the phono-semantic level will help develop the terminology and formalisms (the meta-language) of representing sub-morphemic as well as lexical semantics. Comparative studies of the phono-semantics of related languages could brighten our understanding of the nature of language evolution.

FINAL COMMENTS:

As the tens or hundreds of thousands of morphemes and words of languages are built out of fewer than an average of forty phonemes, with all the possibilities of repetitions of those phonemes in representing many of the recurring and overlapping experiences it should not be hard to imagine the trickling effect of semantic association from the higher forms down to the phonemes. Proponents of the study of the sub-morphemic phenomena such as Magnus (2001) and Bottineau (2008 2010) argue that semantic association with linguistic units does not end at the word or morpheme level. We have demonstrated in this study that in Amharic there is indeed a system of sound-meaning association below the root. The dogma that the relation between sound and meaning is arbitrary is not substantiated by positive facts; nevertheless, it is falsified by empirical evidence in multiple languages and now in Amharic.

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APPENDIX I:

GLOSSARY OF ROOTS/ ETYMONS

Root/ Etymon	Representative gloss
ʔbd	crazy, insane, erratic
ʔbt'	swell, bloat
ʔdl	distribute, handout
ʔdr	live, dwell, remain
ʔfn	suffocate, smother, gag
ʔfr	ashamed, embarrassed
ʔgd	prevent, imped
ʔgr	holt, stop
ʔk'r	belittle, scorn, disdain
ʔlt'	bland, lack seasoning
ʔmr	look beautiful, attractive
ʔmt'	turn sour
ʔnk'	choke; strangle
ʔrg	be old; rise, ascend
ʔrk'	straighten out
ʔt'k'	gird
ʔt'r	brief, shrink; fence
bč'rk'	splatter
bdl	mistreat
bdr	borrow
bdrg	rise, stand
bgr	delimite, outline
bk'l	sprout, grow
bk'r	gambol, frisk
bl	consume, destroy
blč'	shine, glitter

Root/ Etymon	Representative gloss
bld	come out, separate
blg	send out shoots
blk'	gush out
blk't'	open wide
bls	discolored
blš	spoil
blt	oil, lubricate
blt'	surpass, excel
blt'g	rich, wealthy
blz	discolored
br	light up, alight
brbč’	protuberant
brč’k'	squirt, splash
brd	cool off
brdg	rise, stand
brg	shiver, shake
brgd	burst, fling open
brj	turn yellow
brk	kneel, knock knees
brk'	lighten; scintillate
brk's	rip through pile
brkt	durable, numerous
brk't'	numerous
brn	start, wake up
brs	ineffective
brt	strong, tough
brt'	swagger, long step
bry	bolt

Root/ Etymon	Representative gloss
brz	dilute
bsk'l	gaunt, haggard
bt'k'	tear off
bt'r	comb
bt'rk'	split open, perforate
bžgd	senile, err
č’bd	crumple, clench
č’brk'	splash, reflect
č’bt'	grasp, clutch
č’dr	terrorize, frighten
č’fn	close, shut eyes
č’fr	assemble, form; dry, unkempt
č’gd	thrash, beat
č’gr	grow, appear heir on skin
č’k'l	sire, engender offspring
č’k'r	look grim, squint
č’lg	pull back
č’lt'	drink, pour out dry
č’mr	put on, add
č’nfr	sunstroke
č’ngd	cut off, cut up
č’nk'	oppress, distress, squeeze
č’nk'r	hide
č’rg	hang down with fruit, grain
č’rgd	mow, chop
č’rk'	squirt; tender, soft, green
č’rnk'	constrict, press down
?č’t'r	diligent, work hard

Root/ Etymon	Representative gloss
čfn	proud, haughty, arrogant
čfr	take food with lips
čgr	be in difficulty, wanting
čnf	defeat, vanquish
db	ambush; fall with thump
dbk	kneed, mix up thick
dbk'	hide, conceal
dbl	roll up, lump up
dblk'	mix up, confound
dbn	contract, shrink from heat
dbr	pile, stack, heap up
dbs	lose luster, fade, efface; touch, grope
dbš	cause riot, disturbance
dbt	burry, heap, pile up
dby	dusty; full of sand
dbz	tarnished, dull; fade, clouded
ddr	harden, toughen
dfn	fill in, plug up, block up
dfr	venture, take on
dk'l	crossbreed
dk'r	not respond, silent
dlmt'	grow plump, stocky
dlt'	slip, slide
dmr	sum up, amass, accumulate
dmt'	crush flat
dn	dull, blunt, thick
dnb	not respond, silent; mix, mingle
dnbč’	plump, round faced

Root/ Etymon	Representative gloss
dnbk'	resounding blow
dnbl	make slot, carve
dnbr	bolt, jump, flee
dnbs	not listen, inattentive
dnbš	spoilt, fatten
dnbz	bleary, dim
dndr	fat, stocky
dnds	stocky, thick necked
dnf	brag, bluster; slow, tardy
dnfk'	spill over tears
dng	petrify, harden
dngr	err, miss; bar, hobble
dngt	start, startle
dngt'	startle, shock
dngy	petrify, harden
dngz	weaken, dim, dark
dnk	short stature
dnk'	astonish, evoke awe, shock
dnk'f	stumble, obstruct
dnkl	trip up, scoop
dnk'l	poke
dnkr	dance, leap; divert attention, muddle
dnk'r	bolt, bar; not resound
dns	dance; leap, roll
dnsr	sit comfortably
dnws	confuse, muddle
dnz	dull, blunt, numb, stiff
drg	fit together, harmony

Root/ Etymon	Representative gloss
drk'	dry out
drnk'	stuff, cram, compress
drsm	break through, cave in
dsm	bump, butt
fdl	chatter, lie; rogue
fgr	scratch, pow the ground
fk'r	love, like
flg	search, seek
flsm	invent, discover
flt'	split, cleave, crack
fn	squirt, spurt; stick up
fnč’	spring forth
fnč’r	jump out, eject
fnčl	push lightly
fnčr	push over, lie dead
fnd	explode, burst, blow up, expose
fndk'	cheerful, jubilant, gambol, caper,
fndr	slope, slant
fnds	lay down
fng	stink
fngl	overturn, push over
fngr	drop dead
fngt'	move appart, break away, snap
fnjr	separated, far apart; uneven
fnk	overcome by joy
fnk'	split, crac, rip
fnk'l	dislodge, pry up
fnkr	spread out, open

Root/ Etymon	Representative gloss
fnkt	crack, split, cleave, divide, flinch
fnr	protrude, stick out
fnš	be at ease, disport
fnt	remain short, insufficient
fnt'	sit, ride on the back; bounce, leap up
fnt'k'	sprinkle, splatter, splash
fntr	tough
fnt'r	spring out, eject
fnt's	escape, annul, abrogate
fntw	open, clear
fnt'z	gambol, caper
fnz	erect, upright
fr	fear; dig up, excavate
frd	separate, judge
frg	separate, put aside
frgt'	writhe, flail, thrash about
frj	relieve, rescue from distress; separate, categorize
frk	crumble, disintegrate open apart
frk'	divide, separate, break up
frks	crack, split
frkt	break, crack, smash
frm	begin; strive
frns	lie down relaxed
frs	collapse, fall apart, burst
frš	fail
frt	swell up
frt'	squirt
frt'm	contract muscle

Root/ Etymon	Representative gloss
frz	reach age; separate
ft'k'	full a garment
ft'r	create, make, invent
ft'rk'	smash burst
gbd	roughhew, cut trunk
gbt'	cut from inside
gdfr	dig up
gdl	hurt, eliminate, kill
gdr	continue, be able; stagger
gf	push; shove, scoop
gfč’	work sloppily, carelessly
gfč’l	protrude, stick out
gfč’r	scrape, scratch
gfl	dig dirt; grow hairy
gfn	bank, surround with earth
gfr	grow thick long hair
gft	surface residue
gft'	cram
gftr	push
gft'r	push
gfy	thin, malnourished
ggr	harden, solidify
glbt'	turn, inside out, upside down
glmt'	turn, roll eyes
glt'	disclose, uncover
gmdl	cut a large chunk
gmr	mature, develop
gmt'	take a bite, a chunk

Root/ Etymon	Representative gloss
gnbt'	grow tall and tender
gndl	prune
gndr	stocky; shoulder sth sticking out
gnf	boil sticky thick; concentrate, shrink
gnfr	dig gulley; boil over, spill over
gnk'l	sprout, germinate
gnt'r	detach a little at a time
gr	roar, bellow; tame, subdue
grb	turn toss
grbd	open wide vigorously
grbt	be neighbor
grbt'	uncomfortable, uneven
grč’	turn gray; nibble
grč’f	glean
grč’m	chew noisily
grd	screen, veil
grdf	grind coarse
grdm	munch, crunch
grds	break
grf	scourge, singe slightly
grft'	scratch, lacerate
grgb	boil lightly
grgč’	churning a sip in the mouth
grgd	erect wall, partition
grgf	shake, shiver
grgm	break, damage edge
grgs	carry under the arm
grjf	age

Root/ Etymon	Representative gloss
grm	inspire awe; cut off, trim
grmd	take big bite
grms	grow strong young man
grmt'	take a chunk
grn	scorch, burn
grň	tie tight
grs	take mouthful bite; uproot, bring down
grš	relapse
grsm	bump, knock, butt
grt	dump, pile
grt'	puncture, impede
grz	cut off ends
gsk'l	endure hardship
gšlt'	strip off, abrade
gsm	poke, prod, strike
gšmt'	incite, tap
gt'r	be wasteland; rustic
jbd	strike gently, tap
jgd	put too much suddenly
jgr	be in straits, distress
jlt'	rub, abrade, scrape
jmr	initiate, start
jrg	trim, prune
kbd	weigh heavy
k'bd	bloated
k'bt'	spoil, debase, uneasy
k'bt'r	prattle, chatter
kdr	commandeer provisions

Root/ Etymon	Representative gloss
k'dr	proud, haughty, malicious
kfn	wrap up, clothe
k'fn	numb
kfr	tousled; dry, stiff
k'fr	taut, stretch out, dig
k'k'l	boil
k'k'r	cup the ear to hear
k'l	snap, break
k'lb	catch
k'lbč’	handy,
k'lbs	overturn, turn back
k'lbš	turn inside out, upside down
k'lbt	make ring, circle
k'lbt'	small, shrink
k'lč’	open, clear, distinct
k'ld	tease, play a joke on
k'lf	doze, close eyes
k'lj	wander about, be a daze, groggy
k'lm	sully, stain
k'lmd	gibber
klmt'	taste too salty
k'lmt'	wipe lips with tongue
k'ls	turn, bow
k'lš	upset stomach
klsm	thrash, strike hard
klt'	weigh in hand
k'lt	succor, bribe
k'lt'	melt, liquefy; pull out

Root/ Etymon	Representative gloss
k'lt'b	clever, quick
k'lt'f	clever, quick
k'lt'm	break, snap
k'lw	trot, wander
k'lwt'	go house to house, shift glance
k'ly	become deep sea
k'lz	dry out leaf
k'lzm	tangled, matted
kmr	pile, heap
k'mr	reckon
kmt'	turn sour, acid
k'mt'	sit down; cut, sever
k'nbt'	cut off shoots, pinch off
k'ndl	snap off
k'ndr	proud, haughty
knf	fly, flop wings
k'nf	fold back, curl
k'nt'r	eject, hurl; nip off a piece
k'r	remain, left
k'rb	draw near
k'rbč’	blisters, pustules
k'rbt	make a sack of hide
k'rbt'	transfer, put away
k'rč’	crackle, gnash
k'rč’m	jam, snap
k'rd	tear, strip
k'rf	peel, scrap
k'rfč’	stiff, hard

Root/ Etymon	Representative gloss
k'rfd	dry hard
k'rk'b	tie up, pack
k'rk'f	notch, rough terrain
k'rk's	hit
k'rk'z	runt, stunted
k'rm	glean, pick up bits
k'rmd	dry, rough, gaunt
k'rmt	share, divide
k'rmt'	break, tear, bite off a piece
k'rn	horn
k'rň	bind, tie
krnf	pinch nostrils
k'rnt	bind, tie
k'rňt	be bloated
k'rnt'	bind, tie firmly
k'rs	tear, break
k'rš	regurgitate
k'rsm	fumigate for flavor
k'ršm	snap, break with crack
k'rt'	excise
k'rt'f	cut chop tip
k'rt'm	crack by teeth
k'rt's	trim
k'rz	twist, stick out, hang down
k'šbd	deceive with flattery
ksm	dry up, wither
k'sm	absorb, suck
k't'r	chatter, talk loudly

Root/ Etymon	Representative gloss
lbd	lay over, cover
lbt'	lay over, cover
lg	bat; stretch
lgb	patch, paste
lgč	confront
lgd	plug, stop up
lgf	a kind of cloth
lgm	slow work
lgn	close
lgs	extend; give away
lgš	drink immoderately
lgt	put, place
lgt'	stick out
lgz	hold continuously
lm	fertile; soft
lmč’	ripe, mushy
lmč’k’	mushy
lmč’s	lie flat
lmd	adapt habit
lmg	hard to swallow; viscous
lmk	apply on
lmk’	sticky, slimy
lmn	beg, beseech
lmň	wheedle, cajole
lms	lithe, supple
lmš	lithe, supple
lmšk’	lose strength
lmt'	alter shape

Root/ Etymon	Representative gloss
lmtg	gnaw, hunger pangs
lmz	pinch
lmzg	pinch, snatch
lnbd	alter shape
lnbt'	alter shape
lt'k'	attach
mdl	abrade, chafe greatly
mdr	hold ground
mgd	feed
mgr	bind across
mk'l	hang on
mk'r	savory, tasty, delicious
ml	fill up
mlč’	slip
mld	entreat, implore
mlf	remove skin
mlft'	slip off
mlg	slime
mlgd	spit out phlegm with force
mlgš	deform
mlgt'	split open
mlj	speak awkwardly, foolish, stupid
mlk	feature
mlk'	carve, scoop
mlks	become monk
mlkt	locate, demonstrate
mls	bring back
mlt	trick, deceive

Root/ Etymon	Representative gloss
mlt'	shave, slip smooth
mltg	hollow out
mlt'n	bring up matters
mn	thin out
mnč’	spring, gush out
mnč’k'	snatch
mnč’r	scatter, strew
mnčf	snatch
mnčg	pull out
mnčk	stain, stiffen
mnčl	stocky, heavy; sink down
mndb	strike
mndg	pull out
mndl	clean white
mndr	found, settle a village
mnds	grow husky
mnf	fool, stupid
mng	dig out
mngl	pull up, uproot
mnjr	clumsy, too big
mnjz	dirty, grimy
mnk	trot; lurch sway while walking
mnk'	jolt
mnk'l	dismantle
mnk'r	tear up
mnks	become monk
mnň	inferior quality
mnš	wreck

Root/ Etymon	Representative gloss
mnšr	wreck
mnst	trouble, disturb, upset
mnt	split in two, diverge
mnt'	poor
mntf	snatch
mntg	pull out
mnt'k'	snatch
mntl	beset with difficulties; flail
mnt'l	tear off
mnt'r	uproot
mnt'z	gambol wildly
mnz	worthless, vain
mnzk	bring out
mnzl	pull down
mnzr	break apart
mrg	seal, chink
mrgd	turn red; rust
mrk'	bring out saliva
msk'l	crisscross
mslt'	slip out
mst'r	conceal
mt'k'	rise
mtlg	strip off, snatch away
mt'r	try, endeavor, work ones way up
mzlg	pinch pull out
mzlt'	draw out
mzrg	draw out
nbt'	send out shoot

Root/ Etymon	Representative gloss
ndl	bore, open a sluice
nfr	seethe, boil
nfrk'	burst
ngd	trade, travel
ngr	proclaim, announce
nk’l	uproot, dislodge
nk'r	dip out, clear dry
nt'k'	snatch
nt'r	distil, purify
nt'rk'	hit hard
rbd	sink in, subside
rgd	stamp together
rmt'	dip
šbd	bend, bow
sbk'l	quality
šbrk'	dazzle
sbt'r	interlace
sdr	stack, arrange
šdr	make shoddily
sfn	fill, dominate
šfn	cover, screen
sfr	fill up
šfr	negate, oppose absolutely and firmly
šgbt'	mock by flattening ironically
sgd	bend, depress
šgd	enter/exit in numbers
sglt'	scrape
šgmt'	laugh ironically, mock, deride

Root/ Etymon	Representative gloss
sgr	transmit, transfer
šgr	cross over
sk'l	hang up, suspend become fine, good
šk'l	trade; crave long for
šk'r	fearful, shy
šk't'r	make wedge; sharpen the point
sl	paint, draw
slb	enchant, stupefy
slč	be bored
slf	ready, in line
slfd	
slg	slender flexible
šlg	take away, hide
slgb	bulge, sink in (abdomen)
slj	worn out
slk	noiseless smooth move
slk'	grind finely
slk't'	swallow easily
slm	calm
slmt'	swallow easily
sls	turn around
slt	weak, exhausted
slt'	quick
slt'n	train, learn
slw	limp, faint
slwd	spy
smr	conform
šmr	poke up stir

Root/ Etymon	Representative gloss
smt'	sink, shrink
šmt'	shoot bud
šmt'r	feel sour
sn	lose power
snbg	strike, lash
snbk	dent, impress
snbk'	run through
snbr	appear, protrude
snbt	stay a while
snbt'	split, slit
snd	arrange, put in order
sndb	strike
sndk'	bind sheaves; strike with a stick
šndl	limp
sndr	link, thread
šndr	squint, cross-eye
snf	loose, slack
šnf	weaken, discourage
snft'	tickle nose
sng	tie tight
sngč’	walk while looking upward
sngl	polish; train to make adept
sngr	trip up
šngr	squint, cross-eye
snk'	save, preserve
snkl	strike, trip
šnk'l	gore; turn black
snkr	interspersed; poke, jam

Root/ Etymon	Representative gloss
snk'r	wedge between
šnk'r	wedge, peg
snň	to rhyme
snsl	join, link
snt	grow beard, mustache
snt'	level, even
snt'b	incise
snt'k'	split up
sntr	cut open, lacerate
snt'r	splinter, split
snzr	lunge, direct
srbt'	swim through
srg	seep into, sink
šrg	pant, puff, gasp
srgd	dent, impress
šrgd	disappear, lacking, deficient
srk'	leak, escape
srnk'	escape through nose
st'k'	split
st'r	render invisible
št'r	hurry; clever, shrewd
t'bdl	big, stocky
t'brk'	splash, reflect
t'dl	shine, sparkle, glisten
t'dr	stray, wander about
t'fn	bind, plug up, plaster
t'fr	fasten with leather strap
tgr	clamber up, to haggle, to get angry, be choleric

Root/ Etymon	Representative gloss
t'gr	load heavy
t'k'l	roll, wrap, wind
t'k'r	black, soot
tlg	make nauseous
t'lg	dark
t'lsm	spot, speckle, stripe
t'mr	twist together
t'n	firm, resistant
t'nb	stink, putrefy, rot split open, burst
?t'nbf	lay down, throw down
t'nbk'	squash, dent
t'nbr	blur, vision
t'nbs	hit hard, slap
t'nbz	wet, drunk
t'nf	make boundary, edge; drain water
t'nfr	slap hard
t'ng	bind, tie together by winding
t'ngd	hit, strike, destroy
t'ngl	big, strong
t'ngr	squint-eyed
t'nk'	enumerate, ascertain, cautious
t'nk'l	touch with fingertips poke, touch, provoke
t'nkr	harden, toughen
t'nk'r	wedge, bar with bolt, nail gather together
t'nk's	cripple, limp
t'ns	conceive
t'nwt	attack disease
t'nz	wilt

Root/ Etymon	Representative gloss
t'nzb	stagger, fall flat
t'nzl	turn yellow leaf
t'r	call out; clear up
t'rb	carve, hew
t'rf	tie up, demarcate
trg	pulsate
t'rg	clear, sweep
t'rh	clear up
t'rk	dirt, soil, stain
t'rk'	tie, bind, fasten
t'rk'm	assemble, accumulate, stockpile slam, jam
t'rk'š	pierce
t'rm	lean, incline
t'rms	break through wall
t'rmt	death throes
t'rň	take a handful
t'rnk'	hold, bind tight
t'rs	chip tooth
t'rsm	break, shatter
t'rt'm	break open
t'rt's	dull, feeble
t'rwz	move, drag about with difficulty
t'rz	bind, hem
t'rž	wilt
tt'k'	put around the waist, gird
t't'r	harden, be stony
t'wlg	wilt, wither
wdl	roll around idle

Root/ Etymon	Representative gloss
wdr	fix on ground
wfr	thicken
wgd	remove, separate
wgr	nail, hammer
wk'r	pit, chisel
wlbd	evasive, rogue
wlfn	flame, blaze
wlg	slip out, sneak away
wlgd	twist, bend
wlmt'	indecisive; duck
wlt'	disguise, go left and right
wnbd	bolt, dash off
wngr	bar, block
wrg	sway, wiggle
wrk'	turn yellow, glossy
wšgr	interweave
wt'k'	stuff, cram
wt'r	stretch, tauten
zbd	clean, gather together; tremble
zbrk'	stir up, muddle
zbt'	sink, settle
zbt'r	interlace, alternate
zfn	sing; shake
zfr	spread out, fringe, periphery
zgr	stab, slash; spot
zlbd	speak without reflection
zlg	stretch long
zlgd	sallow whole

Root/ Etymon	Representative gloss
zlt'	supple
zmr	sing, chant
znbt'	bulge out
znf	hang extra, exceed
zngr	speckled
znk'	combine, alternate
znk'l	scoop out, poke
znt'r	writhe
zrg	stretch, spread out
zrmt'	slash deep
zrnk'	cram in, press in
zt'r	add too much

APPENDIX II:

THE QUESTIONNAIRE (Amharic)

በአማርኛ ቋንቋ የቃላትን ንባብ/ድምጽ እና ፍች ዝምድና ለመመርመር የተዘጋጀ መጠይቅ

ውድ የዚህ ምርምር ተሳታፊ፣

በቅድሚያ በምርምሩ ለመሳተፍ በመፍቀድዎ በብዙው እናመሰግናለን። በዚህ መጠይቅ የሚሰበሰበው መረጃ በአማርኛ ቋንቋ ላይ ለሚደረግ ትምህርታዊ ምርምር በደጋፊነት የሚያገለግል ይሆናል። በምርምሩ የሚሳተፉት አንድ ጊዜ ብቻ መጠይቁን በመሙላት ሲሆን የሚፈጀው ጊዜም 15 ደቂቃ ገደማ ነው። መጠይቁን የሚሞሉት በውዴታዎ ብቻ ነው። ተመራማሪዎቹም የምላሽዎንና የግላዊ መረጃዎችዎን ምስጢራዊነት ይጠብቃሉ። ሆኖም ግን የኢሜይል ግንኙነት በጠቅላላው ደህንነቱ የተጠበቀ ነው ተብሎ ስለማይታመን፣ ምላሽዎን እንዲልኩልን የምንጠይቀው መረጃዎችዎን በኢሜይል ለተመራማሪዎቹ በመላክዎ ምንም አይነት የደህንነት ስጋት እንደማይኖርብዎ ካመኑ ብቻ ነው።

ስለምርምሩ ጥያቄ ቢኖርዎ ተመራማሪዎቹን በኢሜይል ወይም በስልክ ማግኘት ይችላሉ፦

ዶ/ር ኤያምባ ቦካምባ፡ ኢሜይል bokamba@illinois.edu ስልክ +1-217-244-3051፣ ወይም
በዛ ተስፋው አያሌው፡ ኢሜይል bayalew@gmail.com ስልክ +1-217-344-2930

በዚህ ምርምር ተሳታፊነትዎ ስላለዎ መብት ወይም ማንኛውም አይነት ስጋት ወይም ቅሬታ መጠየቅ ቢያሻዎ የኢሊኖይ ዩኒቨርሲቲን ኢንስቲትዩሽናል ሪቪው ቦርድ በስልክ፡ 217-333-2670 (በምርምር ተሳታፊ ስለመሆንዎ ማንነትዎን ጨምረው የሚገልጹ ከሆነ ቦርዱ የስልክ ተዘዋዋሪ ጥሪ ይቀበላል) ወይም በኢሜይል irb@illinois.edu ማግኘት ይችላሉ።

የግል መለያዎች፡-

ሙሉ ስም፡- ጾታ፡- እድሜ፡-

የትምህርት ደረጃ፡-

አማርኛ መናገር የለመዱት እንዴት ነው?

አፍዎን የፈቱበት ቋንቋ ማን ነው? (ከአማርኛ ሌላ ከሆነ)፦

ከአማርኛ ሌላ የሚናገሯቸውን ቋንቋዎች ይዘርዝሩ፡፦

ዋነኛ የዘወትር መግባቢያ ቋንቋዎ ማን ነው?

በእለት ተለት ሕይወትዎ ከሰዎች ጋር በአማርኛ የሚገናኙባቸው ሁኔታዎች የትኞቹ ናቸው?
መልስ የሚሆኑትን ሁሉ የጊዜያቸውን መጠን ጨምረው ያመልክቱ።

• በቤት ውስጥ ከቤተሰብ ጋር?	☐የለም	☐25%	☐50%	☐100%
• በገበያና በአገልግሎት መስጫ ቦታዎች?	☐የለም	☐25%	☐50%	☒100%
• በትምህርት ቤት በመማሪያ ቋንቋነት?	☐የለም	☐25%	☐50%	☐100%
• በስራ ቦታ ከባለጉዳዮች ጋር?	☐የለም	☐25%	☐50%	☐100%
• በስራ ቦታ ከባልደረቦች ጋር?	☐የለም	☐25%	☐50%	☐100%
• በመልክት/መረጃ ማስተላለፊያ ዘዴዎች (ሬዲዮ፣ ጋዜጣ፣ ቴሌቪዥን፣ ኢንተርኔት ወዘተ.)?	☐የለም	☐25%	☐50%	☐100%
• በመዝናኛ ሁኔታዎች (ሙዚቃ፣ ስነጽሑፍ፣ ቴአትር፣ ወዘተ.)?	☐የለም	☐25%	☐50%	☐100%
• በሌሎች ማሕበራዊ ግንኙነቶች?	☐የለም	☐25%	☐50%	☐100%

ትእዛዝ፡- ከዚህ በታች በሁለት ምድብ ተከፍለው የሚያገኟቸው ጥያቄዎች እውነተኛ ያልሆኑ፣ አማርኛ እንዲመስሉ ሆነው የተፈጠሩ ‘‘ቃላት’’ን የያዙ ናቸው። ‘‘ቃላቱ’’ን ልክ የአማርኛ ቃላት እንደሆኑ አድርገው በማንበብ በትእዛዙቹ መሰረት ጥያቄዎቹን ይመልሱ። ለያንዳንዱ ጥያቄ የሚሰጡትን መልስ ከመወሰንዎ በፊት የቀረቡትን አማራጭ መልሶች በሙሉ በጥሞና አንብበው ያወዳድሩ።

ማሳሰቢያ፡- እባክዎ፣ የፈጠራ ቃላቱን ድምጾችን በማለዋወጥ ወይም በመጨመርና በመቀነስ ከሚያውቋቸው እውነተኛ ቃላት ጋር ለማመሳሰል አይሞክሩ!

በአማርኛ ቋንቋ የቃላትን ንባብ/ድምጽ እና ፍች ዝምድና ለመመርመር የተዘጋጀ መጠይቅ

ሀ - ከተራ ቁጥር 1 – 11 የቀረቡት አራት አራት ቃላት የአማርኛ ቃላት ቢሆኑ በርስዎ ስሜት ከበላያቸው የተሰጠው ፍች ይበልጥ የሚስማማው ለየትኛው ቃል ነው። ምርጫዎን ከቃሉ አጠገብ ያለውን ሳጥን በመጥቃት (click) ያመልክቱ።

1. ድርጁና ጠጣር ነገርን በስቶ/ነድሎ የማለፍ ሃይል፡-

☐ መነሰ ☑ ዘረቀ ☐ ቀደበ ☐ ፈነገ

2. ሃይልን ተቋቁሞ ጸንቶ መቆየት ያለመቻል፣ የመጣስ ሃሳብ፡-

☐ መሰረ ☐ ዘለከ ☐ ሰተለ ☑ ነበቀ

3. በቀላሉ የመለጠጥ/የመንሸራተት ሃሳብ፡-

☐ ደረመ ☐ ጠገሰ ☑ ዘለተ ☐ ነበደ

4. አጥብቆ የመያዝ ሃሳብ፡-

☐ ፈለከ ☐ ዘረደ ☐ ሰከለ ☑ ጠደመ

5. የመላተም/የመጋጠም ወይም ተገንጥሎ/ተላቅቆ የመሄድ ሃሳብ፡-

☐ ቀፈሰ ☑ ነገመ ☐ ደለፈ ☐ ከረዘ

6. ቀጣይነትን/ሂደትን በድንገት የሚቀይር ወይም የሚገታ፡-

☐ ሰለደ ☐ ሰመለ ☐ ለበተ ☑ ፈቀጠ

7. የታፈነ፣ ለመውጣት የሚገፋ ሃይል፡-

☐ ቀፈጠ ☐ ሰከለ ☐ ሰገነ ☑ ደበጠ

8. ሸቅበ/ወደላይ የመነሳት ወይም የማንጎበብ ሃሳብ፡-

☐ ሰደመ ☑ ገፈሰ ☐ ደገዘ ☐ ከረጠ

9. የመጨቆን ወይም የመጨበጥ ሃሳብ፡-

☑ ጠሰመ ☐ ፈከለ ☐ ደፈሰ ☐ ዘቀረ

10. የፈጣንነትና የቀላልነት ሃሳብ፡-

☐ ፈነገ ☐ ጠበደ ☑ ቀፈሰ ☐ ደረመ

11. ወደታች የሚጫን ወይም የሚመዝን ሃይል፡-

☑ ዘበደ ☐ ፈረበ ☐ ገነሰ ☐ ነከለ

በአማርኛ ቋንቋ የቃላትን ንባብ/ድምጽ እና ፍች ዝምድና ለመመርመር የተዘጋጀ መጠይቅ

ለ - ከተራ ቁጥር 12 – 22 የቀረቡት ቃላት የአማርኛ ቃላት ቢሆኑ ከቃላቱ በታች ከተሰጡት አራት አራት አማራጭ ፍችዎች በርስዎ ስሜት ለያንዳንዱ ቃል ይበልጥ የሚስማማው ፍች የትኛው እንደሆነ ይምረጡ። ለቃሉ የመረጡትን ፍች ከፊቱ ያለውን ሳጥን በመጥቃት ያመልክቱ።

12) ደረበሰ

- ☐ በቀላሉ የመለጠጥ/የመንሸራተት ሃሳብ ያለበት ድርጊት
- ☑ ድርጁና ጠጣር ነገርን በስቶ/ነድሎ የሚያልፍ ሃይል ያለበት ድርጊት
- ☐ ሽቅብ/ወደላይ የመነሳት ወይም የማንዣበብ ሃሳብ ያለበት ድርጊት
- ☐ አጥብቆ የመያዝ ሃሳብ ያለበት ድርጊት

13) መነገረ

- ☐ የፈጣንነትና የቀላልነት ሃሳብ ያለበት ድርጊት
- ☐ የመጨቆን ወይም የመጨበጥ ሃሳብ ያለበት ድርጊት
- ☑ ሃይልን ተቋቁሞ ጸንቶ መቆየት ያለመቻል፣ የሙጥጣስ ሃሳብ ያለበት ድርጊት
- ☐ በቀላሉ የመለጠጥ/የመንሸራተት ሃሳብ ያለበት ድርጊት

14) መሰለቀ

- ☐ የታፈነ ለመውጣት የሚገፋ ሃይል ያለበት ድርጊት
- ☑ በቀላሉ የመለጠጥ/የመንሸራተት ሃሳብ ያለበት ድርጊት
- ☐ ወደታች የመጫን ወይም የመመዘን ሃይል ያለበት ድርጊት
- ☐ የመጨቆን ወይም የመጨበጥ ሃሳብ ያለበት ድርጊት

15) ለመገተ

- ☑ አጥብቆ የመያዝ ሃሳብ ያለበት ድርጊት
- ☐ ቀጣይነትን/ሂደትን በድንገት የሚቀይር ወይም የሚገታ ሃይል ያለበት ድርጊት
- ☐ ሽቅብ/ወደላይ የመነሳት ወይም የማንዣበብ ሃሳብ ያለበት ድርጊት
- ☐ የፈጣንነትና የቀላልነት ሃሳብ ያለበት ድርጊት

16) ሰረገመ

- ☐ በቀላሉ የመለጠጥ/የመንሸራተት ሃሳብ ያለበት ድርጊት
- ☐ ወደታች የመጫን ወይም የመመዘን ሃይል ያለበት ድርጊት
- ☑ የመላተም/የመጋጠም ወይም ተገንጥሎ/ተላቅቆ የመሄድ ሃሳብ ያለበት ድርጊት
- ☐ ቀጣይነትን/ሂደትን በድንገት የሚቀይር ወይም የሚገታ ሃይል ያለበት ድርጊት

17) ቀለፈነ

- [x] ቀጣይነትን/ሂደትን በድንገት የሚቀይር ወይም የሚገታ ሃይል ያለበት ድርጊት
- [ ] ወደታች የሚጫን ወይም የሚመዝን ሃይል ያለበት ድርጊት
- [ ] ድርጅና ጠጣር ነገርን በስቶ/ነድሎ የሚያልፍ ሃይል ያለበት ድርጊት
- [ ] የመጨቆን ወይም የመጨበጥ ሃሳብ ያለበት ድርጊት

18) በረቀጠ

- [ ] የመላተም/የመጋጠም ወይም ተገንጥሎ/ተላቅቆ የመሄድ ሃሳብ ያለበት ድርጊት
- [x] የታፈነ ለመውጣት የሚገፋ ሃይል ያለበት ድርጊት
- [ ] ወደታች የሚጫን ወይም የሚመዝን ሃይል ያለበት ድርጊት
- [ ] የፈጣንነትና የቀላልነት ሃሳብ ያለበት ድርጊት

19) ገለፈሰ

- [ ] የታፈነ ለመውጣት የሚገፋ ሃይል ያለበት ድርጊት
- [ ] ወደታች የሚጫን ወይም የሚመዝን ሃይል ያለበት ድርጊት
- [ ] አጥብቆ የመያዝ ሃሳብ ያለበት ድርጊት
- [x] ሸቅብ/ወደላይ የመነሳት ወይም የማንሣበብ ሃሳብ ያለበት ድርጊት

20) ደበረጠ

- [ ] የፈጣንነትና የቀላልነት ሃሳብ ያለበት ድርጊት
- [ ] ሸቅብ/ወደላይ የመነሳት ወይም የማንሣበብ ሃሳብ ያለበት ድርጊት
- [x] የመጨቆን ወይም የመጨበጥ ሃሳብ ያለበት ድርጊት
- [ ] በቀላሉ የመለጠጥ/የመንሸራተት ሃሳብ ያለበት ድርጊት

21) ሰለበቀ

- [ ] የመነዛት ወይም ሸቅብ/ወደላይ የመነሳት ሃሳብ ያለበት ድርጊት
- [x] የፈጣንነትና የቀላልነት ሃሳብ ያለበት ድርጊት
- [ ] አጥብቆ የመያዝ ሃሳብ ያለበት ድርጊት
- [ ] ሸቅብ/ወደላይ የመነሳት ወይም የማንሣበብ ሃሳብ ያለበት ድርጊት

22) ዘነደፈ

- [x] ወደታች የሚጫን ወይም የሚመዝን ሃይል ያለበት ድርጊት
- [ ] የመጨቆን ወይም የመጨበጥ ሃሳብ ያለበት ድርጊት
- [ ] አጥብቆ የመያዝ ሃሳብ ያለበት ድርጊት
- [ ] በቀላሉ የመለጠጥ/የመንሸራተት ሃሳብ ያለበት ድርጊት

APPENDIX III:

THE QUESTIONNAIRE (English Translation)

A questionnaire for testing the relationship between sound and meaning in Amharic

Dear Participant, We would like to thank you very much in advance for your willingness to participate in this research. The information to be collected in this questionnaire is intended for an educational research on Amharic language. The research involves a one-time questionnaire that should take you about 15 minutes to complete. Participation in the survey is voluntary. The researchers will maintain the confidentiality of your personal information and survey responses. However, since email communication is not generally considered secure, please submit your response only if you do not feel being at risk by sending your information by email to the researchers.

If you have questions about the research, you may contact
Dr. Eyamba Bokamba at bokamba@illinois.edu or +1-217-244-3051, or
Bezza Tesfaw Ayalew at bayalew@gmail.com or +1-217-344-2930.

If you have any questions about your rights as a participant in this study or any concerns or complaints, please contact the University of Illinois Institutional Review Board at 217-333-2670 (collect calls will be accepted if you identify yourself as a research participant) or via email at irb@illinois.edu.

Identity: Full Name: Click here to enter text. Sex: Choose an item. Age: Click here to enter text.
Level of Education: Click here to enter text.
How did you acquire Amharic? Choose an item.
Your native language (if different from Amharic) Click here to enter text.
What languages do you speak other than Amharic? Click here to enter text.
What is your major everyday language? Click here to enter text.
What are the situations in which you use Amharic in your daily communication? Choose all that apply together with the extent of use:

• At home with family	☐None	☐25%	☐50%	☐100%
• At the market and services places	☐None	☐25%	☐50%	☐100%
• At school as medium of learning	☐None	☐25%	☐50%	☐100%
• At work with clients	☐None	☐25%	☐50%	☐100%
• At work with colleagues	☐None	☐25%	☐50%	☐100%
• On media (Radio, TV, Newspaper, Internet, etc.)	☐None	☐25%	☐50%	☐100%
• Entertainment (Music, Literature, Theatre, etc.)	☐None	☐25%	☐50%	☐100%
• Other social relations	☐None	☐25%	☐50%	☐100%

Instruction: Below you will find two sets of questions that contain non-real "words" that are coined by imitating real Amharic words. Please answer the questions following the specific instructions by reading the "words" as if they were real Amharic words. Before deciding on your final answers, please read and compare carefully all the four options for each question.

Note: Please do not attempt to relate the coined words to the real words that you know either by inserting and/or deleting or by shuffling the letters/sounds.

A questionnaire for testing the relationship between sound and meaning in Amharic

I. For questions 1-11: If the four words given under each definition are Amharic words, which one is the most suitable for the given definition? Check the box in front of the word to indicate your choice.

1. A force breaking through thick and hard substance

   ☐mns ☐zrq ☐qdb ☐fng

2. Giving in to a strong force, loosing resistance

   ☐msr ☐zlk ☐stl ☐nbq

3. Slipping or stretching easily

   ☐drm ☐Tgs ☐zlt ☐nbd

4. Fitting tight and close or gripping firm

   ☐flk ☐zrd ☐skl ☐Tdm

5. A force of collision or secession

   ☐qfs ☐ngm ☐dlf ☐krz

6. Interrupting or halting continuity

   ☐sld ☐sml ☐lbt ☐fqT

7. Suppressed and exploding force

   ☐qfT ☐skl ☐sgn ☐dbT

8. Rising and hovering

   ☐sdm ☐gfs ☐dgz ☐krT

9. Suppression and compression

   ☐Tsm ☐fkl ☐dfs ☐zqr

10. Speed and simplicity

    ☐fng ☐Tbd ☐qfs ☐drm

11. Gravitating or weighing down

    ☐zbd ☐frb ☐gns ☐nkl

A questionnaire for testing the relationship between sound and meaning in Amharic

II. Questions 12-22: If the words given below are Amharic words, use your intuition to choose the most suitable definition for the given word. Check the box in front of the definition of your choice.

12. drbs

☐Slipping or stretching easily
☐A force breaking through thick and hard substance
☐Rising and hovering
☐Fitting tight and close or gripping firm

13. mngr

☐Speed and simplicity
☐Suppression and compression
☐Giving in to a strong force, loosing resistance
☐Slipping or stretching easily

14. mslq

☐Suppressed and exploding force
☐Slipping or stretching easily
☐Gravitating or weighing down
☐Suppression and compression

15. lmgt

☐Fitting tight and close or gripping firm
☐Interrupting or halting continuity
☐Rising and hovering
☐Speed and simplicity

16. srgm

☐Slipping or stretching easily
☐Gravitating or weighing down
☐A force of collision or secession
☐Interrupting or halting continuity

17. qlfn

☐Interrupting or halting continuity
☐Gravitating or weighing down
☐A force breaking through thick and hard substance
☐Suppression and compression

A questionnaire for testing the relationship between sound and meaning in Amharic

18. brqT

- ☐A force of collision or secession
- ☐Suppressed and exploding force
- ☐Gravitating or weighing down
- ☐Speed and simplicity

19. glfs

- ☐Suppressed and exploding force
- ☐Gravitating or weighing down
- ☐Fitting tight and close or gripping firm
- ☐Rising and hovering

20. dbrT

- ☐Speed and simplicity
- ☐Rising and hovering
- ☐Suppression and compression
- ☐Slipping or stretching easily

21. slbq

- ☐Diffusion and rising
- ☐Speed and simplicity
- ☐Fitting tight and close or gripping firm
- ☐Rising and hovering

22. zndf

- ☐Gravitating or weighing down
- ☐Suppression and compression
- ☐Fitting tight and close or gripping firm
- ☐Slipping or stretching easily

Transliteration of the questionnaire

A questionnaire for testing the relationship between sound and meaning in Amharic

I. For questions 1-11: If the four words given under each definition are Amharic words, which one is the most suitable for the given definition? Check the box in front of the word to indicate your choice.

1. dïrïjunna t'ät'ar nägärïn bästo/nädlo yämaläf hayl፡-

   männäsä zärräk'ä k'äddäbä fännägä

2. haylïn täk'^{w}ak'^{w}mo tsänto mäk'^{w}äyät yalämächal፣ yämät't'as hassab፡-

   mässärä zälläkä sättälä näbbäk'ä

3. bäk'ällalu yämällät't'ät'/yämänshäratät hassab፡-

   därrämä t'äggäsä zällätä näbbädä

4. at'bïk'o yämäyaz hassab፡-

   fälläkä zärrädä säkkälä t'äddämä

5. yämällatäm/yämäggat'äm wäyïm tägänït'lo/tälak'k'o yämähed hassab፡-

   k'äffäsä näggämä dälläfä kärräzä

6. k'ät'aynätn/hidätïn bädïngät yämmik'äyïr wäyïm yämmigäta፡-

   sällädä sämmälä läbbätä fäk'k'ät'ä

7. yätaffänä፣ lämäwt'at yämmigäfa hayl፡-

   k'äffät'ä säkkälä säggänä däbbät'ä

8. shïk'k'ïb/wädälay yämännäsat wäyïm yämanžbäb hassab፡-

   säddämä gäffäsä däggäzä kärrät'ä

9. yämäč'äk'k'on wäyïm yämäč'äbbät' hassab፡-

   t'ässämä fäkkälä däffäsä zäk'k'ärä

10. yäfät'anïnnätïna yäk'ällalïnät hassab፡-

    fännägä t'äbbädä k'äffäsä därrämä

11. wädätač yämmič'an wäyïm yämmimäzn hayl፡-

    zäbbädä färräbä gännäsä näkkälä

A questionnaire for testing the relationship between sound and meaning in Amharic

II. Questions 12-22: If the words given below are Amharic words, use your intuition to choose the most suitable definition for the given word. Check the box in front of the definition of your choice.

12) däräbbäsä

☐bäk'ällalu yämällät'ät'/yämänshäratät hassab yaläbät dïrgit

☐dïrjunna t'ät't'ar nägärïn bästo/nädlo yämiyalf hayl yalläbbät dïrïgit

☐shk'b/wädälay yämänäsat wäyïm yämanïžabäb hassab yalläbbät dïrgit

☐at'bk'wä yämäyaz hassab yalläbbät dïrgit

13) mänägärä

☐yäfät'anïnätna yäk'älalnät hassab yalläbbät dïrgit

☐yämäč'äk'wänï wäyïm yämäč'äbät' hassab yalläbbät dïrgit

☐haylnï täk'wak'wmo tsänïto mäk'wäyät yalämächal: yämät't'as hassab yalläbbät dïrgit

☐bäk'älalu yämälät'ät'/yämänïshäratät hassab yalläbbät dïrgit

14) mäsälläk'ä

☐yätaffänä lämäwt'at yämmigäfa hayl yalläbbät dïrgit

☐bäk'ällalu yämällät'ät'/yämänshäratät hassab yalläbbät dïrgit

☐wädätač yämäč'č'an wäyïm yämämäzzän hayl yalläbbät dïrgit

☐yämäč'äk'k'wän wäyïm yämäč'äbbät' hassab yalläbbät dïrgit

15) lämäggätä

☐at'bïk'o yämäyaz hassab yalläbbät dïrgit

☐k'ät'aynnätïn/hidätïn bädïngät yämik'äyyïr wäyïm yämigäta hayl yalläbbät dïrgit

☐shïk'k'ïb/wädälay yämännäsat wäyïm yämanžabäb hassab yalläbbät dïrgit

☐yäfät't'anïnnätïna yäk'ällalnät hassab yalläbbät dïrgit

16) säräggämä

☐bäk'ällalu yämällät'ät'/yämänshäratät hassab yalläbbät dïrgit

☐wädätač yämäč'an wäyïm yämämäzzän hayl yalläbbät dïrgit

☐yämällatäm/yämäggat'äm wäyïm tägänt'ïlo/tälak'k'o yämähed hassab yalläbbät dïrgit

☐k'ät't'aynätn/hidätïn bädïngät yämmik'äyr wäyïm yämmigäta hayl yalläbbät dïrgit

A questionnaire for testing the relationship between sound and meaning in Amharic

17) k'äläffänä

☐k'ät't'aynätïn/hidätn bädïngät yämmik'äyyïr wäyïm yämigäta hayl yalläbbät dïrgit
☐wädätač yämič'č'an wäyïm yämimäznï hayl yalläbbät dïrgit
☐dïrjuna t'ät't'arï nägärïn bästo/nädlo yämmiyalf hayl yalläbbät dïrgit
☐yämäč'äk'k'on wäyïm yämäč'č'äbät' hassab yalläbbät dïrgit

18) bäräk'ät'ä

☐yämällatäm/yämäggat'äm wäyïm tägänt'lo/tälak'k'o yämähed hassab yalläbbät dïrgit
☐yätaffänä lämäwt'at yämmigäfa hayl yalläbbät dïrgit
☐wädätač yämmič'č'an wäyïm yämmimäzn hayl yalläbbät dïrgit
☐yäfät'anïnnätïnna yäk'ällallïnät hassab yalläbbät dïrgit

19) gäläffäsä

☐yätaffänä lämäwt'at yämigäfa hayl yalläbbät dïrgit
☐wädätač yämič'anï wäyïm yämimäznï hayl yalläbbät dïrgit
☐at'bk'o yämäyaz hassab yalläbbät dïrgit
☐shïk'k'ïb/wädälay yämännäsat wäyïm yämanžabäb hassab yalläbbät dïrgit

20) däbärrät'ä

☐yäfät'anïnätna yäk'älalnät hassab yalläbbät dïrgit
☐shk'b/wädälay yämänäsat wäyïm yämanïžabäb hassab yalläbbät dïrgit
☐yämäč'äk'k'wän wäyïm yämäč'äbbät' hassab yalläbbät dïrgit
☐bäk'älalu yämällät'ät'/yämänshäratät hassab yalläbbät dïrgit

21) säläbbäk'ä

☐yämännäzat wäyïm shïk'k'ïb/wädälay yämänäsat hassab yalläbbät dïrgit
☐yäfät'annïnätïna yäk'ällalïnät hassab yalläbbät dïrgit
☐at'bïk'o yämäyaz hassab yalläbbät dïrgit
☐shïk'k'ïb/wädälay yämännäsat wäyïm yämanïžabäb hassab yalläbbät dïrgit

22) zänäddäfä

☐wädätač yämmič'č'an wäyïm yämmimäzn hayl yalläbbät dïrgit
☐yämäč'äk'k'^{w}än wäyïm yämäč'č'äbät' hassab yalläbbät dïrgit
☐at'bïk'o yämäyaz hassab yalläbbät dïrgit
☐bäk'ällalu yämällät'ät'/yämänshäratät hassab yalläbbät dïrgit