

AGREEMENT IN THE CONTEXT OF COORDINATION
HINDI AS A CASE STUDY

BY

ARCHNA BHATIA

DISSERTATION

Submitted in partial fulfillment of the requirements
for the degree of Doctor of Philosophy in Linguistics
in the Graduate College of the
University of Illinois at Urbana-Champaign, 2011

Urbana, Illinois

Doctoral Committee:

Professor Elabbas Benmamoun, Chair
Assistant Professor Karlos Arregui-Urbina (University of Chicago)
Professor Peter Nathan Lasersohn
Professor Hye Suk James Yoon

ABSTRACT

Agreement is a prevalent phenomenon observed across languages. It helps us identify which elements in the sentence are linked or should be interpreted together (Bock et al 1999). This property of agreement may imply that the PF would always be faithful to syntax/ LF, i.e. it would always show features of the element with which syntax establishes agreement relationship. However, when we look at agreement in the context of coordination, we find that this is not the case. We can get Closest Conjunct Agreement in addition to the Full Agreement with the whole coordinated phrase. One way to account for the Closest Conjunct Agreement is to assume an underlying clausal coordination with conjunction reduction. I show that the constructions involving Closest Conjunct Agreement should not be analyzed as involving clausal coordination based on various theoretical as well as empirical factors. Another way to account for Closest Conjunct Agreement, especially looking at head initial languages, may be to assume that the structure of coordination plays a role in Closest Conjunct Agreement. Using the data from head final languages (mainly Hindi), I have shown that the structure of coordination is not involved in the Closest Conjunct Agreement constructions always. Based on various empirical facts, such as CCA asymmetry based on the word order as in Arabic, CCA asymmetry based on the verb types as in Hindi, the presence of both First Conjunct Agreement and the Last Conjunct Agreement within the same language, the requirement in some languages for strict adjacency for Closest Conjunct Agreement, mixed agreement facts, etc., I present an alternative analysis of Closest Conjunct Agreement which assumes the role of syntactic agreement relations as well as PF relations of linear proximity/ adjacency. I show that this analysis is generalizable across languages with different word orders. Also I show how this analysis is applicable to different

types of constructions, such as local Closest Conjunct Agreement as well as Long Distance Closest Conjunct Agreement. The proposed analysis represents a compositional view of agreement, i.e. it assumes that agreement takes place in two stages: first the agreement relationship is established in syntax, and then the agreement features are spelled out in the PF component. Hence it suggests that, in an agreement relation, not only syntax but also the PF component of grammar plays a role.

ACKNOWLEDGEMENTS

I am indebted to many people who over the years have helped me in uncountable ways. I will not be able to name them all here, but I sincerely thank them all. I am especially thankful to my advisor Elabbas Benmamoun for his constant encouragement, support, guidance, and patience. I am also thankful to him and to the other members of my committee, Karlos Arregi, Peter Lasersohn and James Yoon for meeting with me whenever I needed, for the useful discussions and the valuable comments and suggestions. I especially want to thank Yamuna Kachru for accepting to be the non voting committee member after all her time, her continuous feedback, very helpful discussions and her valuable comments and suggestions so that my defense does not have to be postponed.

I would like to thank Silvina Montrul for providing me the chance to work on an interesting language acquisition project and learn the processes involved in a good experimental work. Designing and conducting the experiment for the Hindi adjectival predicates with Heidi Lorimor also helped me as she guided me every step of the way what she had learnt in her previous experiences with the experimental psycholinguistic work. I thank professors Elabbas Benmamoun, Eyamba Bokamba, Silvina Montrul, and the Linguistics department for providing me the funding and let me experience and practice other aspects of being an academician. I also thank Martha Palmer and Bhuvana Narasimhan for providing me the wonderful opportunity to work on the Hindi Treebank project, which helps me learn not just to use various computational tools, but also to work with huge corpora, interact with the experts to discuss various issues, and learn how they approach the problems. I also thank Masha Polinsky for the fruitful collaboration with me and my advisor which led to the head final languages paper, and a part of research for

this dissertation. I thank Roxana Girju for helping me learn aspects of computational linguistics research, if I have not done much with it yet, it is my own limitations, but I hope to use the knowledge gained so far to learn more in the future. I thank Veneeta Dayal and Roger Schwarzschild, and Christiane Fellbaum for providing me the resources at Rutgers and at Princeton respectively for me to be able to work there. I thank my teachers who first introduced me to linguistics and with whom I used to discuss my various concerns about linguistics- Professors Ramakant Agnihotri, Tista Bagchi, Prem Singh, and K.V. Subbarao. I especially want to thank Tista Bagchi who taught us syntax in such a way that I loved it right away.

I thank my language consultants, most of whom are my friends and family – some of whom have consistently been providing me with the data I need and some who I have bothered with my data questions every once in a while- Amit, Papa, Chetna, Puneet, Alka, Vandana, Rajesh, Mala, Yamuna Ji, Hina, Kalpa, Mithilesh, and many more. I thank my friends, Adriana, Damaris, Dayna, Diya, Lucia, Seema, Sonia & Ben Slade, Vandana for the good times.

Most importantly, I want to thank my family for the numerous things they have done for me that keeps motivating me to persevere. I am deeply thankful to my husband Amit Yadav for many things: the refreshing walks and runs we used to have together, for helping me not be overwhelmed with and learn programming, for the intellectual speeches about the future of technology, and especially for the support during the last few months of writing the dissertation. Last but not least, I cannot express how grateful and strengthened I feel for getting the most loving, caring and accepting parents and siblings. I deeply thank my parents Chander Mohini and Om Parkash Bhatia, my sister Chetna and my brother Puneet for always being there to support me no matter what, for believing in me and always encouraging and motivating me.

TABLE OF CONTENTS

LIST OF ABBREVIATIONS	vii
CHAPTER 1: INTRODUCTION.....	1
1.1. The problem of agreement in the context of coordination.....	2
1.2. Theoretical Framework.....	6
1.3. Relevant Notions.....	10
1.4. Plan for the rest of the theses.....	19
CHAPTER 2: THE LANGUAGE OF FOCUS: HINDI	21
2.1. The grammatical structure of Hindi.....	21
2.2. An outline of the proposal to derive the CCA and FA in the context of coordination.....	43
2.3. Data Collection.....	45
CHAPTER 3: THE STRUCTURE OF COORDINATION IN HINDI	46
3.1. CCA as a Diagnostic for the Structure of Coordination.....	48
3.2. Other Diagnostics for the Structure of Coordination.....	55
3.3. The Structure of Coordination in Hindi: Head Initial Asymmetric Structure.....	62
3.4. Presence of other head initial phrases in head final Hindi.....	72
3.5. Summary.....	74
CHAPTER 4: ANALYSES FOR AGREEMENT IN THE CONTEXT OF COORDINATION	76
4.1. Clausal (/Propositional) Coordination.....	77
4.2. Phrasal Coordination.....	116
4.3. CCA as a Result of Phrasal Coordination with Agree in Syntax and Influences from PF: A Compositional View of Agreement.....	178
4.4. Summary.....	214
CHAPTER 5: GENERAL DISCUSSION, CONCLUSIONS AND FUTURE WORK.....	217
REFERENCES.....	224
APPENDIX A: Findings from the data collected.....	242
APPENDIX B: Previous accounts for clausal vs phrasal coordination as accounts for collective vs distributive reading of the coordinated phrase instead.....	245

LIST OF ABBREVIATIONS

Abs—absolute

Acc—accusative

Dat—dative

Erg—ergative

F—feminine

Fut—future

Gen—Genitive

Hab—habitual

M—masculine

N—neuter

Nom—nominative

Oblique—oblique

Perf—perfective

Pl—plural

Pres—present

Prog—progressive

Pst—past

Sg—singular

Subjunc—subjunctive

1. *INTRODUCTION*

I will begin with an analogy. The study of “language” is like a grand puzzle with little pieces themselves constituting minipuzzles (and so is any other area of study). As we solve the smaller pieces of puzzles, we can hope to begin to form an image of the whole. The way we are able to put the pieces together may unveil the rules of the game, the fundamental principles which the language works with. It is an exciting and a challenging game because while we are trying to put the pieces together, we are also attempting to figure out the rules (formulate the principles) based on which all the pieces will eventually fit together and give us the bigger picture. During the history of linguistic research, we have attempted and seem to have solved some of the puzzles and formulated some principles of language design. As we solve the new puzzles and attempt to put them together with the already solved ones, we are constantly testing the validity of the principles we have formulated so far, and the solutions we have arrived at.

Towards the grand goal of understanding the human language- how it works, what its nature is (the fundamental principles), how its various components and parts interact with each other, and why, I have picked the puzzle of “agreement”. Agreement is a very widespread phenomenon observed among natural human languages. As a result, it becomes a useful tool for comparing languages and for elaborating general principles about how syntactic relationships are ensured (Franck et al 2002). Through a detailed study of agreement in a language we can understand the mechanism of agreement and its various aspects within that language; and

studying it across languages we can draw general principles about the mechanism to help us understand the nature of human language better.

My focus in this thesis, as the title suggests, is on the problem of agreement in the context of coordination. The problem is not entirely new, see Aoun et al (1994, henceforth ABS 1994), Bošković (2009), Doron (2005), Johannessen (1996), Munn (1999), van Koppen (2008) etc for head initial languages, but what has received less/no attention is the actual data from “head final languages”. Adding the data from head final languages, mainly Hindi, to the existing empirical facts about agreement in the context of coordination (from head initial languages), in this thesis, I examined the previous analyses to account for the problem of agreement in the context of coordination and I showed that these analyses face various theoretical and/or empirical problems, I present a solution which covers the new facts from Hindi as well as the facts the previous analyses attempted to account for. I describe the problem in detail in the following section.

1.1. The problem of agreement in the context of coordination

To suggest the significance of agreement in natural human language, Bock et al (1999) state that languages around the world use agreement in number, grammatical gender, animacy and other features to signal which constituents in an utterance are linked (/should be interpreted together) irrespective of whether they appear together or apart. This is illustrated through the following examples, borrowed from Bock et al (1999).

- (1) a. Descriptions of the massacre that **were** discovered yesterday ...
- b. Descriptions of the massacre that **was** discovered yesterday ...

Looking at the agreement on the verb “be” in the above two sentences, we can say that the verb in (1a) refers to the discovery of descriptions, whereas the verb in (1b) refers to the discovery of the massacre. I also agree with Bock et al in that the frequency with which agreement is required in speech (virtually every sentence) further enhances its significance in the language. Both of these factors (the use of agreement as a clue for linking various constituents (or interpreting them together), as well as its high frequency) mark the problem I am focusing on here also as important.

In this thesis, I examine the phenomenon of agreement in the context of coordination. In this context, we expect the agreeing element (e.g. the verb) to show resolved agreement features of the coordinated probe, as is shown in (2a) below. The verb in (2a) appears in a form that denotes the plural subject, whereas the verbs in (2b) and (2c) appear in a form that denotes a singular subject in English.

- (2) a. A boy_[SG] and a girl_[SG] come_[PL] here everyday in the evening.
- b. A boy_[SG] comes_[SG] here everyday in the evening.
- c. A girl_[SG] comes_[SG] here everyday in the evening.

However the resolved agreement pattern is available in the context of coordination (from now on I will call this the Full Agreement pattern or FA), in some languages we also observe another pattern of agreement where the features of only one conjunct appear on the agreeing element. English also shows this agreement pattern in at least the expletive constructions (Shields 2003), as illustrated below. Note here the verb shows singular number feature of the closest conjunct rather than Full Agreement (the plural agreement feature). From now on, I will call this kind of agreement pattern the Closest Conjunct agreement or CCA.

- (3) There remains one package and two letters in the bag.

that we can get Closest Conjunct Agreement (i.e. agreement with a single conjunct) rather than Full Agreement (i.e. agreement with the whole coordinated phrase) only. The possibility of getting the Closest Conjunct Agreement pattern raises a number of issues (regarding the mechanism of agreement, the domain of agreement etc) such as the following. If agreement relation is used to link constituents in a sentence, then why should it be possible to show agreement features of just one of the conjuncts? Is a relation established at all with the whole coordinated phrase or not? If it is why don't we see its reflex in morphology (i.e. why we do not see FA only instead of the possibility of CCA)? Does the CCA pattern tell us something about the construction involving coordination? Could it be possible that the coordinated phrase is not really coordinated at the phrase level in such constructions – but at the clause level (i.e. instead of phrasal coordination, we have clausal coordination)? Could it tell us something about the mechanism of agreement? Is CCA implying that the relation is not completely structural? Could it tell us something about the domain of agreement? That it is not completely structural/syntactic? Are there more than one components of grammar involved in agreement- syntax and PF? Do we see any reason to assume that it is PF? Do we see effects of PF processes? Is syntax involved at all? Do we see effects of syntactic processes? What are the agreement controllers – is it the whole coordinated phrase or just the agreed-with conjunct?¹ If the agreement relation is structural or a component of it is structural- then what agreement configuration is able to explain it? Is just one configuration involved in agreement or are there more than one possible agreement configurations? Do they have the same effect? What are the factors that ensure that the features of the agreement controllers are involved in the PF too- i.e. factors which force FA? Why in

1 Serbo-Croatian type data helps us see it is the whole coordinated phrase that is indeed the controller, note that even though there is CCA in the gender feature, the verb has to show P1 agreement only with respect to the number feature. See Bošković (2009) for examples.

other cases they can be surpassed (to result in CCA)? Why is it possible for the morphology to not be faithful to syntax? What happens in the PF that allows it to be unfaithful to the relations established in the syntax? What is the nature of PF? How are the LF effects observed with CCA and FA constructions? For example, how does CCA and FA interact with the collective predicates, what about the collective vs distributive readings?

In this dissertation, I explore how, instead of always getting the Full Agreement pattern, we can get the Closest Conjunct Agreement pattern as well. i.e. what the mechanism for agreement is? And what factors are involved that lead to FA or CCA- e.g. PF conditions such as linear adjacency; or the presence of collective predicates etc. Since the previous accounts have dealt with head initial languages and most of these accounts assume the structural position of the conjuncts based on the word order of the language to play a role in CCA, in this dissertation, I bring in a new set of data from head final languages, mainly Hindi, that can also act as a test case for the previous accounts. My main goal is to arrive at an account for the variability in agreement with coordinate structures demonstrated in (4) and (5) above that is more general in that it does not restrict to just languages of one word order type, namely head initial, but is generalizable to languages across word order types. In the following sections, I describe the theoretical framework I assume in approaching this problem of variability of agreement with coordinate structures (section 1.2), as well as current understanding of relevant notions such as agreement and coordination (section 1.3), and the design of the rest of the dissertation (section 1.4).

1.2. Theoretical Framework

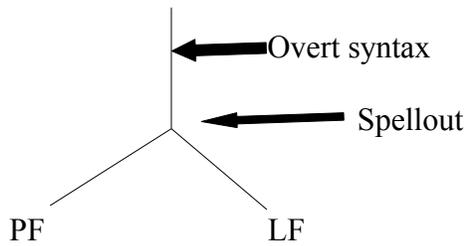
The theoretical framework that I am using for this dissertation assumes Minimalism, the research

program initiated by Chomsky (1993, 1995) and used by many linguists working under the generative grammar paradigm since then. The generative grammar established the notion Universal Grammar (UG) in its earlier days, mainly during the Principles and Parameters approach (late 70s- 80s). Minimalism makes an attempt to understand the properties of UG. The goal of the Principles and Parameters approach is explanatory adequacy of grammar. We want to understand not just what happens and how but also why. Thus the goal is to explain what we observe in languages and this goal is inherited by the minimalist approaches as well. A good theory of language would be able to characterize the properties of the language faculty. It should be able to explain how children are able to acquire languages despite the impoverished nature of the data that they get as input. An expectation is that there would be optimal ways of satisfying the requirements imposed by the mental modules. A minimalist approach to language is guided by such an expectation for a theory of language in the human mind. The model that the minimalist approaches use is the upside down Y-shaped model of grammar as shown in (6) below.² The faculty of language interfaces with the “external performance systems” through the following interface levels: the Phonetic Form (PF) at the articulatory-perceptual interface and the Logical Form (LF) at the conceptual-intentional interface.³ This model assumes that the computation of a structure involves an “overt” computation followed by Spellout at which point the derivation bifurcates into the two interface levels as shown in (6).

2 Also used in the prior Revised Extended Standard Theory.

3 Note the term Phonetic Form (PF) may be misleading, even though the term “phonetic” is used, it does not depend on the modality of the language, i.e. it covers the spoken as well as signed languages.

(6)



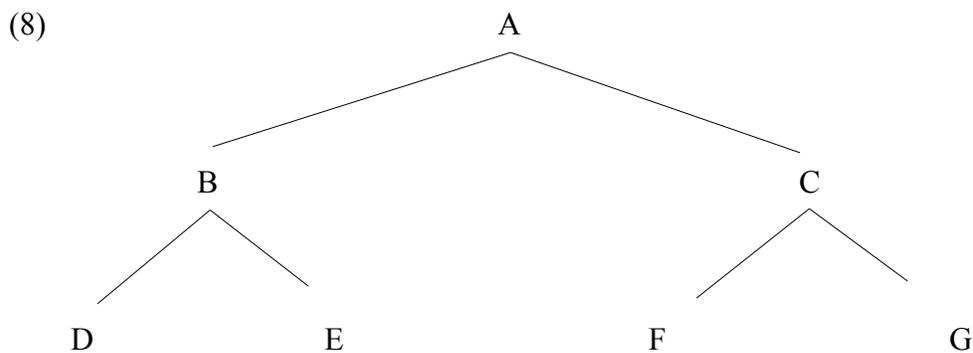
In Chomsky 1995, two grammatical operations, Select and Merge, or their close counterparts are considered necessary. The operation Select selects a lexical item from the numeration and introduces it into the derivation. The operation Merge takes a pair of syntactic objects and combines them to form a new syntactic object. One of the properties of Merge is that one of the syntactic objects in the pair projects into the new syntactic object formed. Another operation called Move is also used in the computation besides Merge. However rather than taking it to be a basic operation, it has been taken as a combination of basic operations Merge and Agree (Munn 2000)/Match (Henderson 2006). It is assumed that there are features in the derivation that need to be checked/ matched which motivated the existence of the operation Move. The features can be interpretable at the interfaces or uninterpretable (Epstein & Hornstein 1999). The uninterpretable features need to be removed before the interface, the interpretable features do not need to be removed as they are interpreted at the interface. Here I assume that the uninterpretable features do not need to be removed entirely, they just need to be checked. Checking means pairing of two elements such that they have the same phi-feature slots, one element has the feature slot filled with interpretable features and the other has the slot filled with uninterpretable features. These features are spelled out in PF, which means the values of the uninterpretable features are matched with the values of the interpretable features. Another property of this model, according to Epstein & Hornstein is that the moves must be short, due to economy considerations of the

minimalist program.

Having described the minimalist framework that I am assuming, I would like to elaborate a little bit more about the operation Agree which I use in the analysis in the chapters that follow. Agree makes use of the notion of c-command. It has been observed in languages across the world that when Agree takes place between two elements, they are found to be in the c-command relation. Baker (2008), in a recent survey of 108 languages, found that the agreement probe (known as the “agreement target” in the previous theories) looks for an agreement goal (known as the “agreement controller” in the previous theories) either within its c-command domain or in whose c-command domain it itself is. I discuss agreement in detail in the following section, but let me state here the definition of the binary relation of c-command which is found to be quite significant syntactically (is involved in a lot of syntactic processes, also but not limited to the agreement relation between two elements). Chomsky (1995) provides the following definition of c-command.

- (7) α c-commands β if α does not dominate β and every γ that dominates α dominates β .

Hence in a structure like (8) below, he points out that B c-commands C, F, and G; C c-commands B, D, and E; D c-commands E and vice-versa; and F c-commands G and vice-versa.



This relation of c-command determines the domain in which the operation Agree (agreement at a distance) may apply. Out of all the possibilities that c-command provides, for agreement, we will see that Agree (at a distance) is assumed in general here, however in chapter 4, I will also show that the spec-head relation for agreement in a local configuration also can be utilized and thus cannot be discarded completely in favor of Agree (at a distance). Below we talk about the notions of agreement and coordination in detail.

1.3. Relevant Notions

1.3.1. Agreement

As mentioned above, agreement is an important phenomenon as it is very widespread across languages, it is important also because it relates to various aspects of language, such as syntax to determine the domain and configuration in which it can take place, semantics to determine its values, morphology through which it may be indicated, lexicon where it may have to be specified sometimes (Corbett 2006). The importance of this phenomenon is also recognized by Boeckx (2008) in his statement that understanding the properties of the agreement systems in natural language would greatly help us in understanding the language faculty as well as the human mind. Here I describe the agreement relation and a brief history of how the mechanisms of agreement have developed over time.

According to Corbett (2006), agreement is a relationship between two elements as a result of which one element carries the information about another element, thus this information about one element on another element is displaced. Lehmann (1988) has called this the referential nature of agreement due to the fact that agreement helps to identify or reidentify the

referents by providing the information about the grammatical properties of its referents. For example, the verb *come* in (9) below displays the number information about another element, the subject *John*.

(9) John	come-s
Sg	Verb-Sg

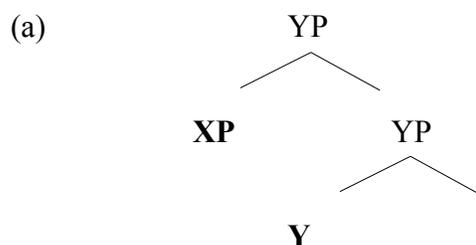
The element that carries the information about other elements, such as the verb in the above example, has been called the “target”(Arnold et al 2007, Corbett 2006) or “Probe” (Bhatt 2005, Chomsky 2000). The element that determines this agreement information, such as the subject in above example, has been called the “controller” (Arnold et al 2007, Corbett 2006) or “Goal” (Bhatt 2005, Chomsky 2000). The information is carried in terms of agreement features, typically the Φ -features, viz. the number, person and gender features. The number information *Sg* in the above example is an instance of number agreement feature.

The agreement relation may take place between a predicate and its argument, such as a verb and a subject noun (Arnold et al 2007, Boeckx 2008, Chomsky 1957 etc). It may be more local, say between a head and a modifier (Arnold et al 2007), for example, within a noun phrase (or a DP), it may take place between a determiner and a noun, an adjective and a noun etc. For some people, the two above mentioned relationships are different, viz “canonical agreement” or “agreement proper”, and “concord” respectively (as noted in Carstens 2000, Chomsky 2001, also see Henderson 2006). For others (Kathol 1999, King & Dalrymple 2004, Sadler 2003, 1999, Wechsler & Zlatic 2003, 2000), the agreement itself can take place using two different sets of features, the “index” and “concord” representing the above mentioned relationships respectively. Baker (2008) suggests, however, that the two types of agreement are instances of fundamentally

the same phenomenon, the observed differences between them arising from the general theory of categories (agreement proper usually involves the category of verbs, and the verbal projections have specifiers; the concord involves the category of adjectives and the adjectival projections do not permit specifiers). The relationship between a predicate (usually verb) and its argument has received much attention so far with very little attention paid to the concord relationship (Arnold et al 2007). Thus the mechanism for the agreement relation as between a predicate and its arguments is much worked upon and there have been many accounts available for this in the literature. These accounts are based on what configurations lead to agreement.

Some of the most commonly used accounts of agreement (“canonical agreement”) consist of agreement through **spec-head relation** (ABS 1994, Benmamoun 1992, Chomsky 1986, 1991, Chomsky & Lasnik 1993, Chung 1998, Kayne 1989, Koopman 1992, 1995, 2001, Koopman and Sportiche 1991, Mahajan 1989, Sportiche 1990, 1998), **government**⁴ (Benmamoun 1992, Harbert & Bahloul 2002, Koopman & Sportiche 1991, Mohammad 1988, Munn 1999), and **Agree** (Chomsky 2000, 2001; also Bhatt 2005 suggested a modified version of Agree, called AGREE). The three agreement configurations (spec-head, government, and Agree) are defined as follows (modeled on Koopman 2006):

(10) Spec-head agreement configuration:



(b) When YP has merged with XP, the XP is in spec-head configuration with the head Y.

⁴ This should be pointed out that government has not been suggested as the exclusive mechanism for agreement in Benmamoun (1992), Harbert & Bahloul (2002), Mohammad (1988) and Munn (1999) etc, instead it has been suggested as a mechanism for agreement in addition to the spec-head relation in these works.

The agreement between XP and Y here is under the spec-head agreement configuration.

(11) Government configuration:

(a) $Y [_{ZP} XP [Z [WP$

(b) Y governs its sister ZP, the spec of its sister, XP, and the head of the complement, Z.

(c) The agreement between ZP and Y or between XP and Y is under the government configuration.

(12) Agree configuration:

(a) $Y [\dots DP \dots]$

(b) The agreement bearing head Y triggers the closest DP in its c-command domain. The agreement between the DP and Y is under the Agree configuration.

Chomsky first defined the spec-head relation in Chomsky 1986, the configuration was widely accepted as a viable configuration for agreement, e.g. Kayne 1989, Sportiche 1990 (also see references mentioned above for the spec-head agreement configuration). However, in 1989, for agreement, the spec-head relation got specialized to take place in AgrP due to Pollock (1989). Later Chomsky (1991) suggested two separate projections for agreement, viz. AgrsP for subject agreement and AgroP for object agreement. Government was also considered a viable configuration for agreement, however, Chomsky (1995) unified the two configurations with the spec-head configuration only as spec position had started being considered the general licensing configuration rather than complement position during the 90s. Chomsky (1998, 2000) abandoned the spec-head configuration in favor of the Agree configuration as Agree has an advantage over the spec-head relation in that it captures the data involving agreement at a distance (without any movement), such as the existential constructions. However, the spec-head account of agreement

has been very productive, and is still assumed in some works, while others have started using Agree or its variants in the recent literature.⁵ For this dissertation, Agree has been assumed as the agreement relation in Hindi, however I also show in chapter 4 below that the spec-head relation cannot be completely abandoned in favor of Agree.

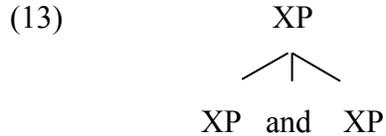
1.3.2. *Coordination*

While a study of agreement can inform us about the specifics in which the languages allow the agreement relation between two elements such as (a) the syntactic and/or linear distance between the two elements, (b) the structure/position in which these elements appear, (c) the manner/configuration in which languages allow this relation, and (d) the extent to which languages differ in expressing agreement depending on their varying properties (such as word orders), coordination can provide us with an additional context where these findings can be tested. Since to look at the agreement in the context of coordination, we first need to understand how coordination works, I spend some time in this dissertation on understanding the structure of coordination (refer to the following subsection as well as chapter 3 below).

1.3.2.1. The Structure of Coordination

Even though a lot of work related to coordination, such as ellipsis, semantic interpretation of conjuncts etc has been studied in the generative paradigm, the structure of coordination had been generally either left unanalyzed or assumed to be ternary branching, as in (13) below, until the 1990s (Camacho 2003).

⁵ Agree has the configuration as in (12) above and has been defined as a relation under which a Probe, with some uninterpretable features, looks for a Goal with matching interpretable features in its c-command domain and checks its features against the interpretable features of the Goal.

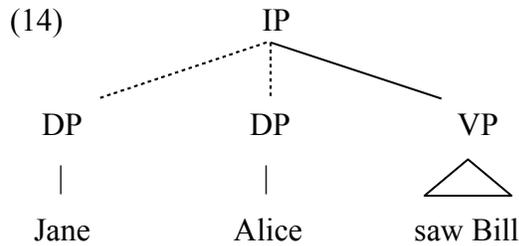


Since then there have been many proposals for the internal structure of coordination based on empirical facts such as c-command asymmetry between the conjuncts (Camacho 1997, Johannessen 1996, 1998, Munn 1993, Zoerner 1995), endocentricity etc. According to Camacho (2003), there are two classes of proposals, viz., (i) each conjunct is licensed separately as if it were in isolation (Camacho 1997, 2000, Goodall 1987), (ii) the conjuncts together form a conjunction phrase, and the licensing requirements of the conjuncts are transferred to this higher phrase which is then licensed (Gazdar et al 1985, Johannessen 1996, 1998, Kaplan & Maxwell 1995, Munn 1993). Below I present some of the specific structures/analyses that have been proposed for coordination.

Chomsky (1965) analyzed coordination under the Conjunction Reduction Analysis, according to which even the NP coordination instances are in fact coordination of propositions/clauses with deletion of some material which results in the surface string (refer to section 4.1 below for details about the mechanisms as well as a critique of the clausal coordination analysis). Goodall's (1987) analysis is also close to Chomsky's propositional/clausal analysis of coordination.

According to Goodall (1987), coordination is a union of phrase markers such that the two trees are pasted one on top of the other and the identical nodes are merged together. A Linearization Principle is required for the correct word order of the conjuncts which, otherwise, are not ordered with respect to each other (they are in separate planes as shown through the dotted lines below). Thus the structure for a sentence “Jane and Alice saw Bill.” would be as

given in (14). In Goodall's analysis, each conjunct has the same status (licensing symmetry) but a tri-dimensional structure is required. Also it has some more problems related to, for example, differences in interpretation preferences found in sentences such as 'Tom and Carol bought ten cars.' vs 'Tom bought ten cars and Carol bought ten cars.' (as pointed out in Johanesen 1998), for both of these sentences, we would get the same structure in Goodall's theory.



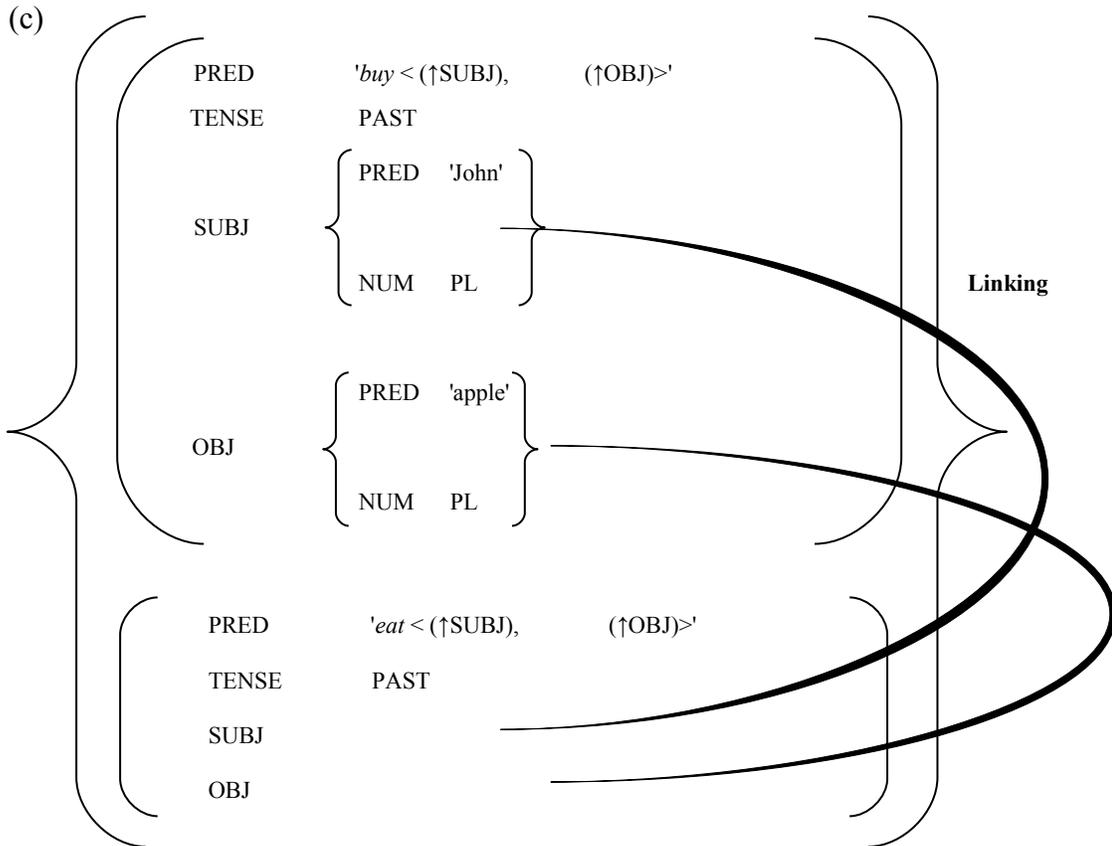
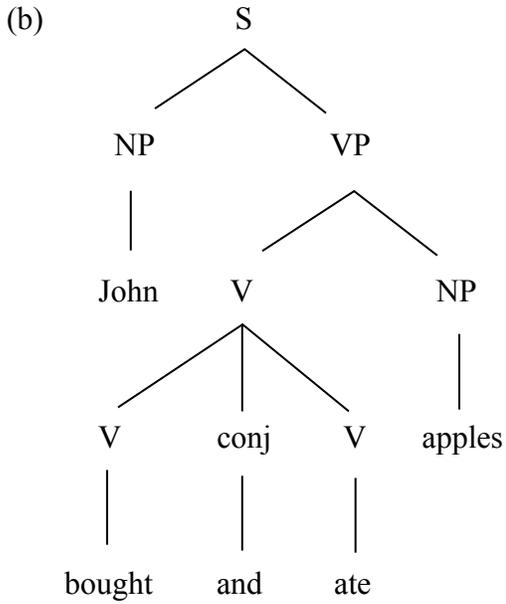
Also Goodall mentions that the sentences such as (15a) cannot be derived under his theory, and they are found to be unacceptable. While that is true for English, it would be a problem for Hindi because Hindi does allow such sentences as is shown in (15b) below (with proper intonation).

- (15) a. John ran and Mary. (English)
 b. john doR-aa aur mary (Hindi)
 John run-Perf and Mary

Kaplan and Maxwell (1995) provide the following structure of coordination using the LFG framework. For them the c-structure (which represents structural relations) for a conjoined phrase involves an n-nary branching constituent as in (16b) below and the f-structure (which encodes functional relations) constitutes a set of f-structures, one for each conjunct, as in (16c) below. The two levels of representation are related through a function that maps nodes in c-structure to f-structure units. In case of coordination, the subjects and objects of the two verbs are linked by allowing the function application to operate on sets of functions. This way the

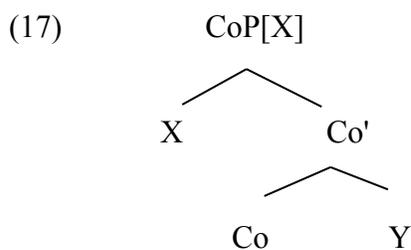
properties asserted on a set as a whole are distributed across all the elements of the conjunction.

(16) (a) John bought and ate apples.



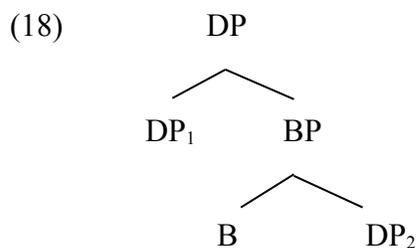
However the problem here is that the licensing symmetry is enforced on f-structure instead of the c-structure, but we find c-command asymmetries among conjuncts that cannot be stated in f-structure terms. For further details about the c-command asymmetry, please refer to the chapter 3 on the structure of coordination in Hindi below (also refer to Camacho 2003, Munn 1992, 1993).

During this period, there have also been many attempts to unify the phrase structure of coordination with that of other heads, thus assuming conjunction to be a head which projects like the major categories (N, V, P and A), with conjuncts in the specifier and the complement positions (Kayne 1994, Munn 1987). Johannessen's (1996, 1998) is one such theory. She considers coordination to be binary branching, and having an asymmetric structure. She proposes the structure in (17) for head-initial languages. Here the conjunction Co is the head of the structure, the Conjunction Phrase (CoP) inherits the syntactic category features of the conjunct (X) in the specifier through spec-head agreement. But the problem with her analysis is the assumption of inheritance of features by the maximal phrase CoP through spec-head agreement, since spec-head agreement never allows the categorial features to percolate up. To solve this problem, she stipulates that the CoP has a slot but it lacks the categorial features, but this slot must be filled to be interpreted at LF which allows the inheritance of categorial features too.



Although originally Munn (1987) also had the same structure of coordination as Johannessen's above, in Munn 1993, he proposed the following structure of coordination (18) based on the

asymmetric c-command facts among other reasons. Here the Boolean Phrase (BP), which consists of the conjunction and a conjunct DP₂, is adjoined to the other conjunct DP₁. For him, the conjunction phrase behaves like a plural entity of some kind, Lasersohn (1995) also shares a similar view (“*Coordinate and plural noun phrases must be treated similarly*”), however Camacho (2003) provides some empirical evidence showing that the conjoined DPs and the plurals are different (for example, in Spanish, plural bare DPs are not allowed in preverbal subject position but conjoined bare DPs are).



For this dissertation, I assume a structure similar to Johannessen's/Munn's. However, note that at this point I am not committing to any one of these two structures. For details, please see section 3.2 below.

1.4. Plan for the rest of the theses

The rest of the theses is designed as follows. In chapter 2, I survey the language of focus, Hindi. I present the clause structure of Hindi and discuss the position of arguments and relevant functional heads in Hindi clauses. In addition, I talk about the case marking, and the agreement mechanism in Hindi, and I outline my proposal for deriving the CCA and the FA patterns in Hindi in the context of coordination. Also I briefly talk about the data I have used for this project. In chapter 3, I arrive at the head initial structure of coordination in Hindi using the

diagnostics to determine the structure, I provide further support for this structure by showing that there are a few other phrases also in Hindi with the head initial structure. In chapter 4, I examine the previous clausal coordination analyses and the phrasal coordination analyses. I present the mechanisms used in these analyses followed by arguments against these analyses. Also, I present an alternative analysis of Closest Conjunct Agreement and Full Agreement for local agreement we proposed in BBP (2009), and Benmamoun & Bhatia (2010, original version 2008, henceforth B&B 2010). I revise the proposed analysis based on Hindi CCA asymmetry data with respect to the types of verbs used, viz the unaccusative vs unergative verbs. I show how this analysis is also applicable to the long distance agreement cases. In chapter 5, I provide a brief summary of the findings discussed in the previous chapters, and discuss some general issues concerning the compositionality of agreement, and the special status of the PF component, and some specific issues such as the prosodic grouping of the agreeing heads with the agreed-with conjunct in Closest Conjunct Agreement constructions, and the adjectival Closest Conjunct Agreement.

2. THE LANGUAGE OF FOCUS : HINDI

In this dissertation, I focus on Hindi, an Indo-Aryan language spoken mainly in parts of Northern India, but also spoken in many other countries (Pakistan, Nepal, Mauritius, Trinidad etc), by approximately six hundred million people according to T.K. Bhatia (1987).⁶ Around the twelfth or thirteenth century, Hindi had emerged as a contact language between the Arabs, Afghans, Persians, Turks, and native residents (Kachru 1980, T.K. Bhatia 1987). Through the succeeding centuries, two distinct styles with different scripts developed out of it: Hindi with Devnagari script and associated with the Hindu population and Urdu with Perso-Arabic script and associated with the Muslim population (Kachru 1980, T.K. Bhatia 1987). Grammatically these two languages are quite similar, and many linguists actually consider them the same language (e.g. Guru 1977, Kachru 2006) and use the term Hindi-Urdu (e.g. Davison 1991a,b, Kachru 1987, Kidwai 2000). Although I am using the term Hindi in this dissertation, I would like to mention that I do not intend to differentiate Hindi from Urdu grammatically, the use of the term just reflects the fact that most of the data has come from people who consider themselves native Hindi speakers or from Hindi newspapers.

2.1. The grammatical structure of Hindi

In this section I present a discussion of the clause structure of Hindi as well as the Case and the

⁶ Kachru (2006) mentions that three hundred million people use Hindi as their first or second language within the north of India.

agreement mechanisms assumed for this project.

2.1.1. *Clause structure and position of arguments in Hindi*

Hindi is a head-final language, hence the canonical word order is SOV(Aux) as is illustrated in (1a) without the auxiliary (i.e. Aux) and (1b) with Aux.⁷ Note that the auxiliaries follow the verb in Hindi.

- (1) (a) raam seb khaa-egaa
 Ram apples eat-Fut
 S O V
 'Ram will eat apples.'
- (b) raam seb khaa-taa hai
 Ram apples eat-Hab Pres
 S O V Aux
 'Ram eats apples.'

In case of double object constructions in Hindi, the default order is S IO DO V (Aux) as is illustrated in (2a) without Aux and (2b) with Aux. The indirect object (IO) precedes the direct object (DO) in the default word order in Hindi (also see Gambhir 1981, Subbarao 1984).

- (2) (a) raam raajiiv ko seb de-egaa
 Ram Rajiv to apples give-Fut
 S IO DO V
 'Ram will give apples to Rajiv.'
- (b) raam raajiiv ko seb de-taa hai
 Ram Rajiv to apples give-Hab Pres
 S IO DO V Aux
 'Ram gives the apples to Rajiv.'

⁷ For more on auxiliaries in Hindi, please refer to section 2.1.2 below.

However, notice that the word order in Hindi is flexible to some extent. Mahajan (1990) suggests that this flexibility in word order is the result of either Argument Shift operations or Adjunction to XP operations.⁸ According to him, the Argument Shift operation is an A- movement operation which is induced by Case requirements of the NP arguments; the Adjunction to XP, on the other hand, is an A'- movement operation. Notice the sentences given in (3) below which are possible in Hindi as a result of these movement operations (borrowed from Mahajan 1990). Although the sentences in (3) do not include any Aux, note that there are various possibilities when the Aux is present in the sentence. However the verbal complex (the verb together with the auxiliaries; i.e. the verb head, Aspect head, Tense head and the heads of any functional projections that come in between) seems to act as a unit and cannot be broken while scrambling (Butt 1995). This can be argued based on the fact that the verbal complex seems to not allow stranding in case of scrambling of the verb or of the auxiliaries.⁹ However refer to the end of this section where I discuss the notion of verbal complex as a unit, but first let me introduce the clause structure in Hindi.

- (3) (a) raam-ne kelaa khaa-yaa (SOV)
 Ram-Erg banana eat-Perf
 'Ram ate a banana.'

8 This word order variation has been referred to as scrambling in Hindi (Dayal 2001, Gambhir 1981, Kidwai 1995, Mohanan 1995 etc), however, Mahajan (1990) abandons the term “scrambling” and identifies three separate operations instead, the Argument Shift, the Adjunction to XP and the head movement operation. According to Mahajan, the first two of these operations result in what has been characterized as scrambling phenomenon in Hindi generally.

- 9 (i) (a) raam-ne kelaa [khaa-yaa hai] (SOVAux)
 Ram-Erg banana eat-Perf Pres
 'Ram has eaten a banana.'
 (a.1) * hai raam-ne kelaa khaa-yaa
 (a.2) */? hai raam-ne khaa-yaa kelaa
 (a.3) */? hai khaa-yaa raam-ne kelaa
 (a.4) */? khaa-yaa raam-ne kelaa hai
 (a.5) */? khaa-yaa raam-ne hai kelaa
 (a.6) */? raam-ne hai kelaa khaa-yaa etc...

(b)	raam-ne	khaa-yaa	kelaa	(SVO)
(c)	kelaa	raam-ne	khaa-yaa	(OSV)
(d)	kelaa	khaa-yaa	raam-ne	(OVS)
(e)	khaa-yaa	raam-ne	kelaa	(VSO)
(f)	khaa-yaa	kelaa	raam-ne	(VOS)

I follow Koopman and Sportiche (1988) in that all the arguments are base-generated VP-internally (also see Kitagawa 1986, Kuroda 1988, Sportiche 1988 for VP-internal subject hypothesis). The arguments may move out of VP for various reasons such as Case, EPP, focus, topicalization etc. Following Dwivedi (1991), I assume that the negative element *nahiiM* is the head Neg of the NegP itself. In the sentential negation, the Neg head appears to the left of the verb, see (4).¹⁰

(4)	raam	vahaaM	nahiiM	jaa	rahaa	hai
	Ram	there	not	go	Prog	Pres
	'Ram is not going there.'					

For the structure of a phrase, I assume that generally the phrases are head final with specifiers as well as complements on the left of the head.¹¹ The tree in (6) below represents the clause structure for the following sentence in (5).

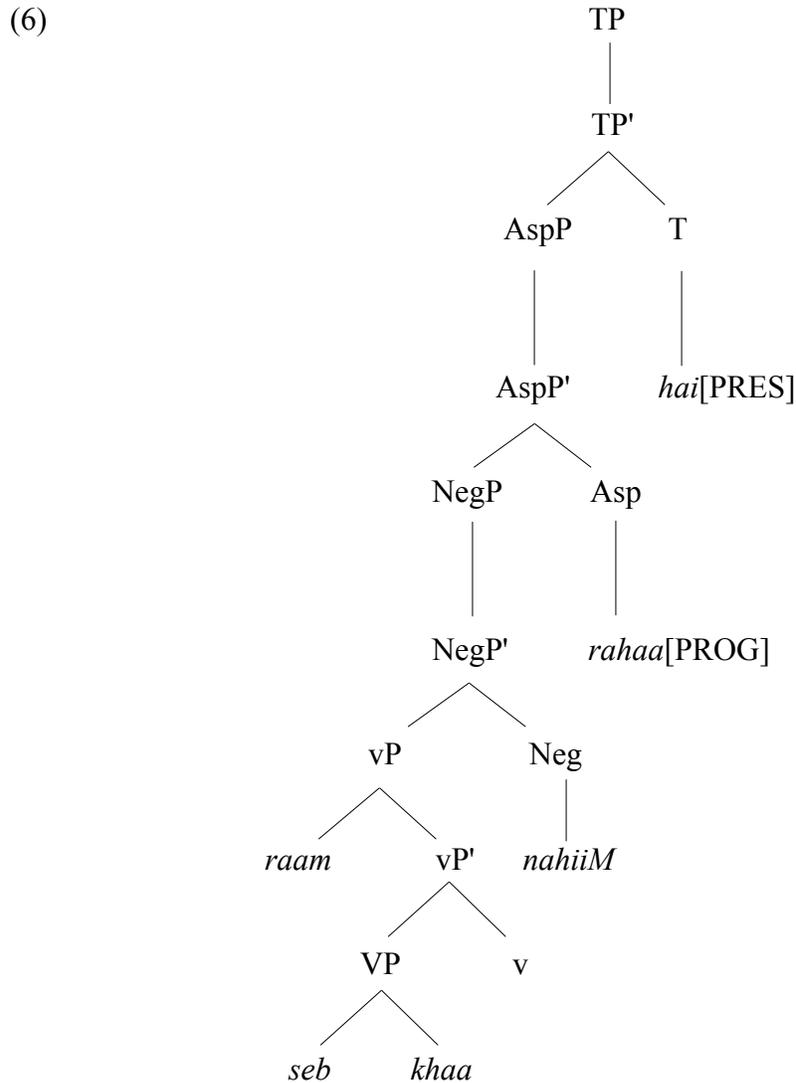
10 Since the Neg head appears higher in the structure than V, we may assume that the Neg head gets prefixed to the V, say, due to overt verb movement to the Neg head. Note that when the verbal complex is fronted, the Neg also moves with it. Notice (ii a) below, corresponding to (4) above, is acceptable since the Neg is fronted together with the whole verbal complex, but (ii b) is unacceptable or odd when the Neg is left behind and the verbal complex is fronted.

(ii) (a)	[nahiiM	jaa	rahaa	hai]	raam	vahaaM	[t]
(b) *	[	jaa	rahaa	hai]	raam	vahaaM	[nahiiM t]

However, the question of whether the Neg-V order is the result of overt verb movement or some other operation requires further investigation.

11 However the phrases such as NP, VP, AdjP and PP are head final in Hindi, we also observe a few phrases which seem to show a head initial structure, see chapter 3 below (section 3.3) for more details.

- (5) *raam seb nahiiM khaa rahaa hai*
 Ram.MSg apple not eat Prog.MSg Pres.Sg
 'Ram is not eating apples.'



Here, the subject *raam* moves to the [spec, TP] position. According to Davison (2003, 2004), this movement might be explained by the EPP feature on the T head which requires a specifier of TP in overt syntax (although, as she mentions, the [spec, TP] may be a null *pro*). As mentioned in the footnote 10 above, the Neg head gets prefixed to the verb *khaa*.

Now let's turn to the notion of verbal complex as a unit.¹² As I had mentioned above, the verbal complex seems to form a unit in the sense that it tends to be pronounced together and not be broken in general, i.e. stranding in case of scrambling of verb or auxiliaries does not, in general, seem to be permitted. However, at this point, I would like to mention that it is not the case that the verbal complex is never broken at all, note the judgements in footnote 9 above. Dwivedi (1991) provides an example where the verb+Aspect can be fronted leaving the Tense head behind, see (8a). She mentions that this order is also grammatical, although it is marked. Similarly Kumar (2006) provides an example in which the verb+Aspect has been scrambled leftward leaving the Tense behind, see (8b). He mentions in the footnote that the sentence is not ungrammatical, its just not the canonical order.

(8) (a) khaa-taa raam roTii thaa, magar ab purii khaa-taa hai
 eat-Hab Ram bread Pst but now fried.brea eat-Hab Pres
Verb+Aspect ... Tense

'Ram used to eat bread but now he eats fried bread.'

(borrowed from Dwivedi 1991: 88, modified for consistency)

(b) */? maiM paRh-taa kahaaniyaaM huuM
 I read-Hab stories Pres
Verb+Aspect ... Tense

'I read stories.' (borrowed from Kumar 2006: 21, modified for consistency)

Based on the facts such as illustrated in (7) and (8) above, it can be taken that scrambling of verb alone (when, e.g., the Aspect head is not a dependent morpheme, e.g. progressive aspect, refer to section 2.1.2 for details) or of verb+Aspect (usually when the aspect is a dependent morpheme as in the case of habitual aspect which is affixed to the verb, but even otherwise), or of verb+Aspect+Tense is possible, however the scrambling results in a marked word order which

¹² Note, as mentioned above too, the verb together with the auxiliaries, i.e. the verb head, Aspect head, Tense head and the heads of any functional projections that come in between, is considered as the verbal complex.

may seem awkward to the speakers.¹³ Dwivedi (1991) suggests that verb-Aux incorporation might be taking place in dialects of Hindi where the verbal complex cannot be broken (i.e. where stranding is not allowed).

Let's now look at the verbal inflection and auxiliary system with respect to the Tense and Aspect in Hindi in more detail.

2.1.2. Tense & Aspect in Hindi

In Hindi sentences, the tense and aspect markers may be dependent morphemes or independent morphemes. In the Hindi grammars or Hindi linguistics literature (e.g. Gambhir 1981, Guru 1977, Kachru 1966, 2006, Kellogg 1938, Kumar 2006, McGregor 1972, Spencer 2005), generally the terms “suffix” or “clitic” have been used for the dependent tense and aspect morphemes, whereas the term “auxiliary” has been used for the independent tense and aspect morphemes. It should be noted that only one dependent tense or aspect morpheme may attach to the host verb at most, if there are other tense or aspect morphemes which are also dependent forms, an auxiliary, similar to the “do-support” in English, is inserted to which the dependent morpheme may attach.¹⁴

Aspect in Hindi: The values of aspect that we usually observe are : Habitual (Hab), Progressive (Prog), and Perfective (Perf).¹⁵ These are illustrated in the following examples (9a-c).

13 Two possibilities in which the scrambling of the verbal complex may take place are listed as follows. It may be the result of scrambling of just the head (V or V+Aspect or V+Aspect+Tense etc). Alternatively, it may be the result of scrambling of the whole VP after scrambling of the other material (such as subject, object etc) out of the VP to the left or extraposition to the extreme right positions in the sentence.

14 However, this is not true for the mood and tense marker combinations. For example, the future tense marker, which is a dependent morpheme, attaches to the verb host to which the subjunctive mood marker (also a dependent morpheme) is attached. See example (10c) and footnote 17 below.

15 Some linguists (Kachru (1966, 2006) among others) also use the following terms for these aspect values: the Habitual is also known as the Imperfective or the Imperfect, the Progressive is also known as the Durative.

(9) (a) **Habitual (Hab) :**

raajiiv	roz	school	jaa- taa	hai
Rajiv	everyday	school	go- Hab	Pres

'Rajiv goes to school everyday.'

(b) **Progressive (Prog) :**

raajiiv	ab	school	jaa	rahaa	hai
Rajiv	now	school	go	Prog	Pres

'Rajiv is going to school now.'

(c) **Perfective (Perf) :**

raajiiv	kal	school	ga- yaa
Rajiv	yesterday	school	go- Perf

'Rajiv went to school yesterday.'

Note that the habitual aspect marker (“taa”/ “tii”/ “te”/ “tiiM”) and the perfective aspect marker (“yaa”/ “yii”/ “ye”/ “yiiM”) are dependent morphemes in Hindi whereas the progressive aspect marker (“rahaa”/ “rahi”/ “rahe”) is an independent morpheme.¹⁶ As mentioned above, if the aspect marker is a dependent morpheme (i.e. habitual or perfective aspect), it is attached to the verb host. However, if there are other dependent or independent morphemes intervening between

16 The statement that the habitual and the perfective aspect markers are dependent morphemes whereas the progressive aspect marker is an independent morpheme/lexical item can be supported by the following facts. The independent lexical items such as the negative element “nahiiM” ‘not’ can intervene between the verb and the progressive aspect marker as in (iia). But the Neg morpheme cannot intervene between the verb and the habitual aspect marker (iib) or the verb and the perfective aspect marker (iic).

- | | | | | | | | |
|-------|--|-------|------|--------|-------|------|-------------------------|
| (iia) | raam | seb | khaa | nahiiM | rahaa | hai | |
| | Ram | apple | eat | not | Prog | Pres | |
| | 'Ram is not eating the apple.' (he is doing something else with it.) | | | | | | |
| (iib) | *raam | seb | khaa | nahiiM | taa | hai | (✓ khaa-taa nahiiM hai) |
| | Ram | apple | eat | not | Hab | Pres | |
| | 'Ram does not eat the apple.' (he does something else with it.) | | | | | | |
| (iic) | *raam-ne | seb | khaa | nahiiM | yaa | hai | (✓ khaa-yaa nahiiM hai) |
| | Ram-Erg | apple | eat | not | Perf | Pres | |
| | 'Ram hasn't eaten the apple.' (he has done something else with it.) | | | | | | |

One way to explain the facts in (iii a-c) under the distributive morphology approach is to assume that the dependent morphemes get attached to the verb host in the PF component, say through Lowering or inversion operations, whereas the independent morphemes do not participate in such PF operations.

the verb host and the dependent aspect marker, an auxiliary (/light verb) is inserted to provide the dependent morpheme a host to attach to. For example, in (10a), the dependent aspect marker Hab intervenes between the verb host and the dependent aspect marker Perf (see the bolded items), hence a light verb “jaa” 'go' is inserted to which the dependent aspect Perf can attach. Similarly in (10b), the independent aspect marker Prog intervenes between the verb host and the dependent aspect marker Hab (see the bolded items), hence a light verb “ho” 'be' is inserted to which the dependent aspect Hab is attached.

(10) (a) vah **paRh**-taa ga-**yaa**
 he read-Hab go-Perf
 'He kept reading.'

(b) vah **paRh** rahaa ho-**taa** thaa
 he study Prog be-Hab Past
 'He used to be studying.'

Tense in Hindi: The values of tense that we observe are : Present (Pres), Past (Pst), and Future (Fut). These are illustrated in the following examples (11a-c).

(11) (a) **Present (Pres):**

raajiv kitaabeM paRh-taa **hai**
 Rajiv books read-Hab **Pres**
 'Rajiv reads books.'

(b) **Past (Past) :**

raajiv kitaabeM paRh-taa **thaa**
 Rajiv books read-Hab **Pst**
 'Rajiv used to read books.'

(c) **Future (Fut) :**

raajiiv	kitaabeM	paRh-e-gaa
Rajiv	books	read-Subjunc-Fut ¹⁷

'Rajiv will read books.'

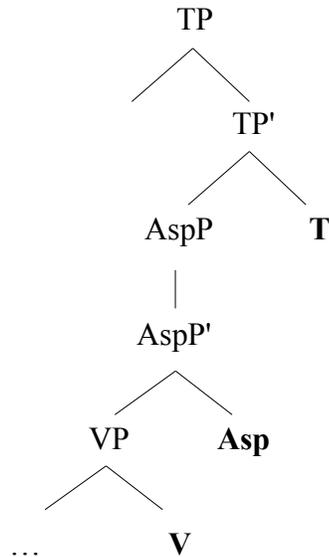
Here I assume that all three tense markers are dependent morphemes and thus require a host to be attached to. In case of the future tense, it is possible to not have either of the aspect markers (habitual/ progressive/ perfective) present in the sentence, see example (12a). Thus the dependent T Fut morpheme can attach to the verb host directly as there are no intervening heads. If an aspect marker is present, it intervenes the verb host and the Tense morphemes, see (12 b-d). Hence the dependent T morpheme cannot attach to the verb. In such cases, an auxiliary/light verb “ho” 'be' (like the English Do-support) is inserted to which the dependent T morpheme is attached.

- | | | | |
|-----------------------------------|--------|-----------|------------------|
| (12) (a) vah | kitaab | paRh-egaa | |
| he | book | read-Fut | |
| 'He will read the book.' | | | |
| (b) kam se kam | vah | to | paRh-taa ho-gaa |
| at least | he | EMPH | study-Hab be-Fut |
| 'He, at least, must be studying!' | | | |
| (c) vah | kitaab | paRh-taa | hai |
| he | book | read-Hab | Pres |
| 'He reads the book.' | | | |
| (d) vah | kitaab | paRh-taa | thaa |
| he | book | read-Hab | Pst |
| 'He used to read the book.' | | | |

17 Note the “Subjunc” (used to abbreviate “Subjunctive”) is a mood marker. The mood heads can have values such as – indicative (declarative or interrogative), imperative, subjunctive, potential, infinitive etc as is mentioned in Yates (1827). According to him, subjunctive is one of the moods. I will not discuss the mood markers in detail here, and from now on, I will not specify the “Subjunc” in case of future, instead I will just use the Fut in the glosses for simplicity.

Usually the sequence in which the tense and aspect markers appear with respect to the verb in Hindi is V-Asp-T. The following tree in (13) reflects this order.

(13) Sequence of Tense and Aspect morphemes in the Hindi syntactic tree



I will talk about the agreement features that the tense and aspect markers show as well as the mechanism based on which the agreement features on these tense and aspect heads are decided in detail in section 2.1.4 below. But before that, let's talk a little bit about the case marking in Hindi.

2.1.3. *Case Marking in Hindi*

Hindi is a split ergative language (Kachru 1965 mentions this following the traditional grammar of Guru 1919; also see Bittner & Hale 1996, Dixon 1979, Pandharipande & Kachru 1977 among others). The split in Hindi ergativity is conditioned by the aspect distinctions (perfective *vs.* non-perfective) and the transitivity of the verb (Givón 1984: 161). Thus, the subjects in Hindi are marked morphologically with the Ergative Case when the verb is transitive and in perfective

aspect, or they are in Nominative Case when the verb is either intransitive or in non-perfective aspect or both. Besides the Nominative Case (no overt Case marking) and the Ergative Case (with “ne”), in Hindi sentences, we get arguments with Accusative Case (with a postposition/clitic “ko”), Dative Case (with “ko”) and other postpositional Cases. This is summarized and illustrated in table 1 below.

(14) Table 1: Cases and case markers in Hindi

<i>Case</i>	<i>Case marker</i>	<i>Hindi Example</i>
Nominative		raam aa-yaa Ram.Nom.MSg come-Perf.MSg 'Ram came.'
Ergative	ne	siitaa-ne ghar dekh-aa Sita.FSg-Erg house.Nom.MSg see-Perf.MSg 'Sita saw the house.'
Accusative	ko	raam battakhoM-ko dekh-taa hai Ram.Nom.MSg duck.Obl.FPl-Acc see-Hab.MSg Pres.Sg 'Ram sees/looks at the ducks.'
Dative	ko	raam kitaaboM-ko siitaa-ko de-taa hai Ram.Nom.MSg book.Obl.FPl-Acc Sita-Dat give-Hab.MSg Pres.Sg 'Ram gives the books to Sita.'
Other Postpositional - e.g. Source	se	raam-ne mohan-se kitaabeM khariid-iiM Ram.MSg-Erg Mohan.MSg-from book.Nom.FPl buy-Perf.FPl 'Ram bought books from Mohan.'

With respect to the Ergative vs Nominative Case on the subjects, although most of the times the split is based on transitivity of the verb and the perfective aspect as mentioned above, it does not explain all the instances. For example, several intransitive verbs (the “unergatives” such as “chiiMk” 'sneeze', “nahaa” 'bathe', “bol” 'speak', “khaaMs” 'cough') also require/ allow an ergative subject. See Guru (1919) for a list of intransitive verbs that require an ergative subject,

also reproduced in Kachru (1965, 1966). Some verbs may or may not take an ergative subject, e.g. “laa” 'bring', “jan” 'give birth', “jaan” 'know' etc, see Kachru (1981). In light of such verbs, many linguists such as Butt (1995), Butt & King (1991), Kachru (1971, 1981, 1990, 2006), Khan (1987), Mahajan (1990), Mohanan (1990), have argued that the ergative could also be a marker for volitionality/ agentivity. The Nominative vs Ergative subject Case marking in Hindi as described above is summarized in table 2 in (15) below.

(15) Table 2: Nominative vs Ergative Case marking on the Subject arguments in Hindi

<i>Case marking</i>	<i>Context</i>	<i>Hindi Examples</i>
NOM Case on the subject NP	T without a v and perfective / non-perfective aspect (un-accusative verbs)	(a) raam gir-aa Ram. Nom fall-Perf 'Ram fell.'
	T with a transitive v and non-perfective aspect	(b) raam liichiyaaM khaa-taa hai Ram. Nom Lichis eat-Hab Pres 'Ram eats Lichis.'
ERG Case on the subject NP	T with a transitive v and perfective aspect	(c) raam-ne liichiyaaM khaa-iM haiM Ram- Erg Lichis eat-Perf Pres 'Ram has eaten the Lichis.'
	T with un-ergative v and perfective aspect and volitionality of the subject	(d) laRkiyoM-ne chiiMk-aa girls- Erg sneeze-Perf 'The girls sneezed (voluntarily).'
NOM Case on the subject NP	T with un-ergative v and perfective / non-perfective aspect, no volitionality of the subject	(e) laRkiyaaM chiiMk-iiM girls. Nom sneeze-Perf 'The girls sneezed (involuntarily).'

For this thesis, I follow Bhatt's (2005) account for Case marking. The v associated with the transitive verbs assigns Acc Case to the objects. The tense head T together with transitive v and

perfective aspect assigns Erg Case to the subject, other combinations of T, v and aspects assign Nom Case to the subject. Bhatt does not discuss the Case of the subject in presence of the unergative verbs with volitionality of the subject illustrated in (15d) in the table above. For this, I assume that if v is unergative, then in perfective aspect, the T, v and Aspect combination may assign either the Erg or the Nom Case depending on the volitionality of the subject. Thus I assume that the verb may subcategorize for a [+/- Volitional control] subject NP. Taking Bhatt's suggestion itself that other (other than with the perfective aspect) combinations of T, v and aspects assign Nom Case, even for unaccusatives, we can assume that the unaccusative argument gets Nom assigned through this combination.

The Acc Case marked direct object may move out of the vP to some higher projection if it is human animate and/or specific and gets *ko*- marking there. Following Anand & Nevins (2006), we call this phrase the EncP (EncP, here, is basically a phrase outside of the VP domain where the specific objects are assumed to move, Anand & Nevins (2006) call this the EncP following Enç's (1991) work on specificity). However, Anand & Nevins differ from the present account in that they assume that the direct object gets the Acc Case in the EncP, not inside the vP; I do not follow their account as it makes wrong predictions about the Hindi data (for example, incorrect word order in the ditransitive sentence: the direct object follows the indirect object, which implies that the direct object has not moved out of VP to the EncP, but it still has the Acc case). As mentioned above, following Bhatt (2005), I assume that the v associated with the transitive verbs assigns Acc Case to the objects. Thus we see that the T and the v heads assign Cases on the subject and direct object NPs depending on the conditions as mentioned above.

Following Davison (2003, 2004), I also assume that the Dative Case on the indirect object is a lexical Case. Finally, I assume that the Postpositional Cases are lexical Cases. We may assume that all the structural Cases (Nom, Erg, Acc) are assigned under c-command by T or v heads; and all the lexical Cases (Dat and Postpositional) are assigned by the lexical items they are associated with as Davison assumes, although it does not affect my analysis even if they were all taken to be licensed in c-command or spec-head configuration etc.

Let us now move to the agreement system in Hindi.

2.1.4. Agreement in Hindi

In this section, first I state the facts about Hindi agreement, also I specifically talk about the agreement features that the tense and aspect markers carry and then I discuss the mechanism through which this agreement might be carried out.

2.1.4.1. Facts about Hindi Agreement:

In Hindi, the tense and aspect (and mood) markers, whether they are dependent morphemes or independent lexical items, agree with the most prominent non-Case marked (i.e. highest not-overtly Case marked) argument in the sentence.¹⁸ This is illustrated in (16) below, most of these repeated from table in (15) above, notice the bold parts. In (16a), the subject is non-overtly Case marked (it carries Nom Case), the T and Asp markers agree with it. In (16b), the subject is overtly Case marked (Erg) but the object is not (Acc- non overt), the T and Asp markers agree with the object. (16c) shows the default agreement (3rd person Masculine Singular) on the T and

¹⁸ Bhatt (2005) mentions that the verbs as well as auxiliaries agree with the most prominent non-Case marked argument in Hindi. Here the agreement on the verb refers to the agreement shown by the T, Asp, and Mood affixes attached on the verb.

Asp markers since neither the subject nor the object are non-overtly Case marked.

(16) (a) *Transitive verb, imperfective aspect, Subject non-overtly Case marked (Nom), verb-subject agreement:*¹⁹

raam	liichiyaaM khaa- taa	hai
Ram.MSg	Lichis.FPl eat-Hab.MSg	Pres.Sg

'Ram eats Lichis.'

(b) *Transitive verb, perfective aspect, Subject overtly Case marked (Erg), object non-overtly Case marked (Acc), verb-object agreement:*²⁰

raam-ne	liichiyaaM	khaa- iM	haiM
Ram.MSg-Erg	Lichis.FPl	eat-Perf.FPl	Pres.Pl

'Ram has eaten the Lichis.'

(c) *Transitive verb, perfective aspect, subject (Erg) as well as object (Acc) overtly Case marked, default agreement:*

laRkoM-ne	liichiyooM-ko	khaa- yaa	hai
boys.MPl-Erg	Lichis.FPl-Acc	eat-Perf.MSg	Pres.Sg

'The boys have eaten the Lichis.'

In case of intransitive unaccusative verbs, the subject carries Nom Case (i.e. it is non-overtly Case marked), thus the T and Asp heads agree with it as shown through (16d) below.

(16) (d) **raam** **gir-aa** **thaa**
 Ram.MSg fall-Perf.MSg Pst.MSg
 'Ram had fallen.'

With intransitive unergative verbs in the perfective aspect, the subject may be overtly Case marked (Erg) with the volitional reading, in that case the T and Asp heads get the default agreement, as shown in (16e), however it may even be in Nom Case (i.e. it is non-overtly Case

19 Note that even though descriptively, I am using the terminology “verb-subject agreement”, it is the agreement of the T and Asp heads with the subject argument.

20 As in footnote 19 above, note that even though descriptively, I am using the terminology “verb-object agreement”, it is the agreement of the T and Asp heads with the object argument.

marked) with the non-volitional reading, then the T and Asp heads agree with it as in (16f).

(16) (e) laRkiyoM-ne chiiMk-**aa** **thaa**
 girls-Erg sneeze-Perf.**MSg** Pst-**MSg**
 'The girls had sneezed.'

(f) **laRkiyaaM** chiiMk-**iiM** **thiiM**
 girls.**FPI** sneeze-Perf.**FPI** Pst.**FPI**

Sometimes the subject is overtly Case marked as Dat, in both the non-perfective aspect (16g) as well as the perfective aspect (16h), such as with the psych verbs. The T and Asp heads in such cases do not agree with the subject, but with the Nom argument.

(16) (g) siitaa-ko **gussaa** aa-**taa** **thaa**
 Sita-Dat anger.**MSg** come-Hab.**MSg** Pst.**Sg**
 'Sita used to get angry.'

(h) siitaa-ko **gussaa** aa-**yaa** **thaa**
 Sita-Dat anger.**MSg** come-Perf.**MSg** Pst.**Sg**
 'Sita had gotten angry.'

As can be seen from the examples in (16) above, both the T as well as the Asp markers show agreement features of the agreed-with argument. Let us now look at the agreement features these T and Asp markers show.

All three aspect markers as well as the past tense marker show the number and gender features, see the tables in (17-20) below for the forms these markers take for different number and gender values (borrowed from Bhatt 2003, modified for consistency).

(17) Agreement on the habitual aspect marker:²¹

Number \ Gender →	Masculine	Feminine
↓		
Sg	-taa	-tii
Pl	-te	-tii/-tiiM

(18) Agreement on the progressive aspect marker:²²

Number \ Gender →	Masculine	Feminine
↓		
Sg	rahaa	rahii
Pl	rahe	rahii/rahiiM

(19) Agreement on the perfective aspect marker:²³

Number \ Gender →	Masculine	Feminine
↓		
Sg	-(y)aa	-(y)ii
Pl	-(y)e	-(y)iiM

(20) Agreement on the past tense marker:²⁴

Number \ Gender →	Masculine	Feminine
↓		
Sg	thaa	thii
Pl	the	thiiM

21 As we saw in section 2.1.2 above, the Hab Asp marker is a dependent morpheme attached on the main verb or an auxiliary/light verb.

22 As mentioned in section 2.1.2 above, the Prog Asp marker is an independent lexical item.

23 As mentioned in section 2.1.2, the Perf Asp marker is a dependent morpheme attached on the main verb or an auxiliary/light verb.

24 Again as mentioned in section 2.1.2, the Pst T marker is a dependent morpheme, which is attached to the light verb “ho”. Here the forms of the Pst T marker already attached on the light verb are shown.

The present tense marker shows the person and number features. This is shown in (21) below (again borrowed from Bhatt 2003, although I have a 2nd person Plural form “haiM” as well besides “ho” which Bhatt (2003) does not mention; modified for consistency). Also see Kachru (2006) where all the verb forms showing agreement are presented, note she also includes the Singular, Plural as well as the honorific forms, for example, see Kachru (2006: 155).²⁵

(21) Agreement on present tense marker:²⁶

Number \ Person →	1 st	2 nd	3 rd
↓			
Sg	huuM	hai	hai
Pl	haiM	ho/haiM	haiM

In the future tense, we see the person, number and gender features.²⁷ This is shown in (22) below (again borrowed from Bhatt 2003, modified for consistency).

(22) Agreement on future tense marker:²⁸

25 However note that the honorific form is homonymous with the Plural form.

26 Again as mentioned in section 2.1.2, the Pres T marker is a dependent morpheme, which is attached to the light verb “ho”. Here the forms of the Pres T marker already attached on the light verb are shown.

27 According to Bhatt (2003), it is not surprising that the future tense form agrees in person, number as well as gender features since it is a morphologically complex form that consists of the subjunctive ending which agrees in person and number, and another part which he calls the participial form agrees in number and gender. He mentions in his footnote 1 that at this stage of Hindi, the subjunctive form and the future in Hindi are very closely bound and so no element may intervene them.

Note that the future tense marker does not apply to the verb directly, it always requires the subjunctive mood marker, I illustrate this in the following examples, also see the table above for the whole paradigm.

- (iv) (a) maiM kal jaa-uuM-gaa / jaa-uuM-gii
I tomorrow go-Subjunctive.1Sg-Fut.MSg/ go-Subjunctive.1Sg-Fut.FSg
'I will go tomorrow.'
- (b) tum kal jaa-o-ge / jaa-o-gii
you tomorrow go-Subjunctive.2Pl-Fut.MPl/ go-Subjunctive.2Pl-Fut.F
'You will go tomorrow.'

28 As mentioned in section 2.1.2, the Fut T marker is a dependent morpheme attached either on the main verb or on the auxiliary/light verb “ho”.

Person →	1 st	2 nd	3 rd
Gender & Number ↓			
MSg	-uuM-gaa	-e-gaa	-e-gaa
MPl	-eM-ge	-o-ge/-eM-gee	-eM-ge
FSg	-uuM-gii	-e-gii	-e-gii
FPl	-eM-gii	-o-gii/-eM-gii	-eM-gii

Having looked at the agreement facts in Hindi and the agreement features the tense and aspect markers show in Hindi, let us now consider the mechanism of agreement through which the above mentioned agreement facts are achieved.

2.1.4.2. *The Agreement Mechanism in Hindi:*

In this dissertation, following Bhatt (2005), I assume that the relationship through which agreement takes place between the verb and one of its arguments is the relation AGREE (a modified version of Chomsky's Agree). The relation AGREE is defined as follows:

- (23) “AGREE is the process by which a head X^0 (the Probe) with a complete set of unvalued uninterpretable features identifies the closest Y^0/YP in its c-command domain with the relevant set of visible matching (i.e. nondistinct) interpretable features (the Goal), and uses the interpretable features of Y^0/YP to value its uninterpretable features.” (Bhatt 2005)

There are three possible accounts of how agreement in the clause represented in (6) above may take place using the AGREE relation defined above.²⁹ These are described below. I suggest that out of the three options, the first and the third option are more likely to be correct than the second

²⁹ From now on, I will use the terms “AGREE” and “Agree” interchangeably, however, note that by both the terms, I refer to the relation as defined in (23) above.

(refer to footnote 31 below). At this time, I choose the third option which is also used to explain the long distance agreement facts in Bhatt (2005), however even the first option can be shown to give us the same result.

Option 1: The verb moves overtly to the higher functional heads. After the verb movement to the higher functional heads (for example, Neg, Asp or Tense as described in section 2.1.2 above) has taken place, the whole verbal complex acts as a probe (may be due to the T head). This probe looks down for an appropriate goal. As mentioned in the definition for AGREE in (23) above, an appropriate goal would be the closest element that has the relevant interpretable features.³⁰ In Hindi this element happens to be the highest NP argument in the sentence that is not overtly Case marked. The probe (i.e. the verbal complex) establishes the relation AGREE with this goal. As a result, all the uninterpretable features in the verbal complex are valued against the interpretable features of the goal.

The other two options are similar to what Bhatt (2005) suggests for Long Distance Agreement, these are described as follows.

Option 2: The Asp head and the T head individually act as probes. The Asp heads have uninterpretable n and g features, whereas the T heads have uninterpretable p and n (and g) features. Both the Asp head and the T head probes search for the relevant element (the goal that has corresponding interpretable features). Both probes, the Asp head and the T head, find the

³⁰ The probe requires that the goal has the relevant interpretable features so that the probe can get its uninterpretable features valued against the interpretable features of the goal. As was mentioned in chapter 1 (section 1.2) above, the uninterpretable features are checked in syntax (i.e. pairing of two elements probe and goal takes place such that they have the same phi-feature slots, one element has the feature slot filled with interpretable features and the other has the slot filled with uninterpretable features) and then these features are spelled out in PF, which means the values of the uninterpretable features are matched with the values of the interpretable features.

same goal (the highest NP argument in their c-command domain that is non-overtly Case marked and thus has interpretable n, p and g features). Thus they establish the relation AGREE with this goal. Since both the probes find the same element as their goal, this results in the fact that the Asp and T heads both agree with the same argument.³¹

Option 3: Under this option also, as in option 2 above, the T head and the Asp head are two separate probes. When the T head probes down for an appropriate goal, however, it comes across the Asp head which has \emptyset -features. But since these features on the Asp head are not interpretable features, a dependency is created between the T and the Asp head, but the T head further probes down. It finds the highest non-overtly Case marked argument as its goal which has interpretable features. Thus the T head establishes AGREE with this goal. It values its own features as well as covaluates the features of the Asp head. I choose this third option as the mechanism of AGREE based on some facts about Long Distance Agreement in the context of coordination leading to Closest Conjunct Agreement which will be presented in chapter 4 below.

For the fact that the T and Asp heads can only agree with the structurally most

31 However, this option may not be preferred when we look at the data with coordinated phrases. Even though Hindi has the option of showing both FA as well as CCA with the coordinated phrases, we find that the only agreement possibilities are either for both the T and the Asp head to show CCA (va), or for both of them to show FA (vb). We do not observe cases where the T head shows FA, whereas the Asp head shows CCA (vc), or vice versa (vd).

(v) (a)	us-ne	thoRii	der	pehle	hii	seb	aur	liichii	khaa-yii	thii
	he-Erg	just.a.little.bit.ago				apple.MSg	and	Lichi.FSg	eat-Perf.FSg	Pst.FSg
	'He had eaten an apple and a lichi just a little bit ago.'						(CCA on both T and Asp)			
(b)	us-ne	thoRii	der	pehle	hii	seb	aur	liichii	khaa-ye	the
	he-Erg	just.a.little.bit.ago				apple.MSg	and	Lichi.FSg	eat-Perf.MPI	Pst.MPI
							(FA on both the T and Asp)			
(c) *	us-ne	thoRii	der	pehle	hii	seb	aur	liichii	khaa-yii	the
	he-Erg	just.a.little.bit.ago				apple.MSg	and	Lichi.FSg	eat-Perf.FSg	Pst.MPI
							(FA on T and CCA on Asp)			
(d) *	us-ne	thoRii	der	pehle	hii	seb	aur	liichii	khaa-ye	thii
	he-Erg	just.a.little.bit.ago				apple.MSg	and	Lichi.FSg	eat-Perf.MPI	Pst.FSg
							(CCA on T and FA on Asp)			

prominent (i.e. the highest) argument that is not overtly Case marked (refer Bhatt 2005 among others), I assume that the overtly Case marked NPs form postpositional phrases (PPs), i.e. [NP P].³² Following Rezac (2008), I assume that the PPs form phases in the sense that they are opaque domains for narrow-syntactic dependencies such as \emptyset -Agree. Thus the NP/DP within a PP is not visible to \emptyset -Agree outside the PP.³³ Thus while the agreement probes (i.e. the whole verbal complex, or the T and Asp probes in covaluation relation) probe down for an appropriate goal, the overtly Case marked arguments (i.e. PPs) are inert.

In this section we looked at the Hindi clause structure, position of arguments, the T and Asp system, the Case marking and the agreement facts in Hindi and the agreement mechanism. In the following section, I provide an outline for my proposal for deriving the CCA and the FA in the context of coordination in Hindi.

2.2. An outline of the proposal to derive the CCA and FA in the context of coordination

I assume that in both the CCA as well as FA cases, the syntactic relation of Agree (i.e. AGREE as defined in (23) above) is established with the whole coordinated phrase acting as a goal. As a result, the resolved features of the whole coordinated phrase become accessible to the agreeing

32 As mentioned above too, the T and Asp heads in Hindi agree with the subject argument as that is structurally the most prominent argument. But when the subjects are PPs, the T and Asp heads do not agree with them. Examples of PPs as subject arguments include the ergative subjects (16b, c, and e), dative subjects (e.g. the experiencer subjects, see (v) below), genitive subjects (vi). In (v) and (vi) below, the subjects are in bold.

(v) vidya-ko	gussaa		aa-yaa	
Vidya.FSg-Dat	anger.MSg		come-Perf.MSg	'Vidya felt angry.'
(vi) anil-ke	ek	beTii	thii	
Anil.MSg-Gen	one	daughter	be.Pst.FSg	'Anil had a daughter.'

33 On analogy with the oblique NPs [NP P], for the oblique forms of pronouns that appear without any overt postpositions as well, I assume that they form a PP [pronominal-NP P] where the pronoun and the postposition combine phonologically to form a single word. For example, [maiM ko] is pronounced as “mujhe”, [ham ko] is pronounced as “hameM” etc.

head (the probe). However, when Agree is established, the probe also has access to the internal structure of the coordinated phrase. In the PF component, the agreeing head may spell out the resolved features that are accessible to the agreeing head due to the Agree relation established in the syntax. This results in FA. However, an application of certain PF conditions may alter the result thus obtained, in the sense that it may provide an alternative output. For example, in Hindi, the PF condition of linear proximity allows a probe to look through the internal structure of the whole coordinated phrase and access the linearly closest conjunct while spelling out the agreement features. This results in CCA.³⁴ If some other process also accesses the whole coordinated phrase in addition to Agree (say, an additional spec-head agreement relation, or the presence of Number Sensitive Items which take the whole coordinated phrase as their antecedant), the resolved agreement features may get reinforced, forcing the FA.

Thus the PF condition of linear proximity can operate in Hindi to result in CCA when the whole coordinated phrase' features are not otherwise reinforced. In some languages, even a stricter PF condition, namely, the condition of linear adjacency, is required for it to be able to alter the output of agreement relation established in syntax, for an example see BBP (2009) for Tsez. It is the PF conditions of linear proximity/ linear adjacency which determine whether First Conjunct Agreement takes place or the Last Conjunct Agreement (depending on whether the first or the last conjunct is linearly most proximate or adjacent to the agreeing predicate), and whether intervening elements are permitted or not for CCA to take place. Note, in

34 As mentioned in chapter 4 (section 4.2) below, Marušič et al (2010) also suggest another way to access a conjunct from within the whole coordinated phrase in the PF component for some languages such as Slovenian: the probe may also access the structurally closest conjunct rather than the linearly closest conjunct to spell out the agreement features. They suggest that if the probe accesses the conjunct before linearization, the hierarchical structure is available and thus structurally closest conjunct is chosen for the agreement features' spellout, this results in Highest Conjunct Agreement. If, however, the probe attempts to access a conjunct inside the whole coordinated phrase after linearization, linearly closest conjunct is chosen, resulting in Closest Conjunct Agreement.

Hindi, where we do not have the stricter linear adjacency requirement, as the number/size of intervening phrases increases, we tend to get more FA and less CCA. For the details of the analysis, please refer to chapter 4 (section 4.3) below.

2.3. Data Collection

The data used for this dissertation have been collected mainly through surveys with native Hindi speakers, a speech production experiment that I conducted together with Heidi Lorimor, and the Dainik Jagaran corpus³⁵. Most of the native speakers were originally from Delhi or Uttar Pradesh, a few speakers were from Bihar. Almost all the speakers had also learnt English before they went to school. The surveys were either conducted in person (paper-pen) or through emails or online surveys (google forms)³⁶. The Dainik Jagaran corpus consisted of 1945144 words and 978 files, where each file was a comprehensive and complete printed discourse in itself and consisted of news articles or analysis pieces on various topics. Besides these sources of data, google search, as well as other online newspapers were also used from time to time. The findings from these data are summarized in Appendix A, these findings were used for the proposal and the revision of the analysis presented in chapter 4 (section 4.3) below.

35 I would like to thank Professor Richard Sproat for providing me with the Dainik Jagaran corpus.

36 I would like to thank Professor Maria Polinsky and her Research Assistant Ekaterina Kravtchenko for introducing the Google survey to me.

3. *THE STRUCTURE OF COORDINATION IN HINDI*³⁷

In the previous literature such as Johannessen (1996, 1998), Munn (1993, 1999, 2000), Soltan (2007) etc, the Closest Conjunct Agreement (CCA) pattern has been assumed as a diagnostic for the structure of coordination.³⁸ In these analyses, CCA is analyzed as involving an agreement relation with the structurally higher conjunct in the coordination, it is thus assumed that whichever conjunct the verb agrees with is the higher conjunct in the coordination structure. Thus according to these analyses, CCA hints at the structure of coordination: an asymmetric structure with the agreed-with conjunct in the higher or more prominent position. This type of analysis is attractive as it seems to provide us with an intuitive sense behind CCA, also empirically it has been found to fit with the data in head initial languages. However, it is important to test whether the structure of coordination thus established is an accurate characterization of the structure independently of agreement (CCA) as well or not, i.e. whether there is any other way to test the structure of coordination, and also to test whether this works with languages having different word orders (e.g. head final languages).

Fortunately we can use some other diagnostics as well for an asymmetric structure besides CCA to test whether the conjuncts within the coordination structure are or not in a symmetric relation with each other. For example, in head initial languages, such as English, it has been argued that the leftmost conjunct is structurally more prominent than the other

³⁷ Most of the content in this chapter is from a squib- B&B 2010.

³⁸ These analyses are discussed in more detail in chapter 4 (section 4.2) below.

conjunct(s). The arguments come from binding, movement (Munn 1993), prosody (Ross 1967, Munn 1993) etc which can be used as diagnostics for the structure of coordination besides CCA. As we can see, both CCA as well as the other diagnostics such as binding, movement and prosody suggest the same structure of coordination for head initial languages. In head initial languages, first conjunct agreement has been observed and thus CCA argument suggests that the first (leftmost) conjunct is structurally higher than the other conjuncts, the other diagnostics also suggest the structural prominence of the first conjunct. However, this is not sufficient to assume that CCA is an indication for the structure of coordination. If it really is a true indicator of the structure, then it should also give us the correct results in languages with other word orders (where we find last conjunct agreement).

In this chapter, I show that the results from CCA, on the one hand, and the other arguments, on the other, do not overlap for head final languages (not all the head final languages at least) as they do for head initial languages. I show that head final Hindi displays CCA with the last (rightmost) conjunct. Thus, following the logic used for head initial languages as mentioned above, this would suggest that the rightmost conjunct is structurally higher than the other conjuncts. However, the other diagnostics such as binding, movement, prosody etc show that the leftmost conjunct is structurally more prominent even in Hindi. Thus I argue that Hindi coordination patterns with English coordination in being head initial with the leftmost conjunct structurally more prominent than the rightmost conjunct. Consequently, I conclude that CCA does not argue for the structural prominence of a particular conjunct. Looking at it in the reverse direction, what this suggests is that CCA can not be explained/analyzed in terms of the structure of coordination. I will discuss possible analyses for CCA in chapters 4 below.

The chapter is organized as follows. In section 3.1 below, I present two previous accounts that take CCA as a diagnostic for the structure of coordination. In section 3.2, I discuss other diagnostics for the structure of coordination.³⁹ In section 3.3, I consider these arguments for the structure of coordination with respect to Hindi data and show that all the arguments (that are relevant for Hindi data) except CCA provide evidence that Hindi has a head initial (asymmetric) structure of coordination. I interpret this to suggest that CCA is not an indication for the structure of coordination, and thus conclude that the structure of coordination in Hindi is head initial just like head initial languages such as English. In section 3.4, I present data involving some other phrases in Hindi which also have head initial structure to show that my conclusion regarding the coordination phrase being a head initial phrase in Hindi is not unlikely/far fetched, despite the fact that phrases such as Noun Phrase, Adpositional Phrase and Verb Phrase are indeed head final. I summarize the results in section 3.5.

3.1. CCA as a Diagnostic for the Structure of Coordination

As was mentioned in chapter 1 above, the CCA is a pattern of agreement in the context of coordination where the predicate seems to agree with just one of the conjuncts (the closest conjunct) rather than with the whole coordination phrase. For example, in head initial Arabic, this pattern of agreement is observed if the verb precedes the subject (i.e., the VS order). This is illustrated by the Moroccan Arabic data in (1) below from ABS (1994). Notice the verb *mfa* agrees with the closest (first) conjunct *ʕumar*.

(1) mfa	ʕumar	w	ʕali	
left.MSG	Omar	and	Ali	'Omar and Ali left.'

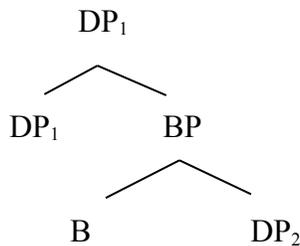
³⁹ However note that all of these arguments (diagnostics) do not apply to Hindi due to other differences between the languages that have been considered in the literature and Hindi.

One way to access the leftmost conjunct in (1) is to appeal to the structure of coordination, taking coordination to be an asymmetric structure where one of the conjuncts is structurally more prominent than the other and thus can enter into asymmetric relations with it. This is exactly the approach proposed by Benmamoun (1992), Johannessen (1996, 1998) and Munn (1993) who rely on the notion of government to establish an agreement relation between the verb and first conjunct. The assumption is that the agreed-with conjunct is in a more prominent position (due to the asymmetric structure of coordination) and thus the predicate has access to it/ its features under government (or in current framework Agree as in Soltan 2006, 2007). The non-prominent conjunct is expected not to be accessible to agreement because it is deeply embedded within the configuration of coordination.

Thus two of the representative asymmetric structures for coordination in the literature are Munn's structure (1993, 1999) as illustrated in (2) below, and Johannessen's structure (1996, 1998, which was also Munn's 1987, 1992 structure) as illustrated in (3) below.

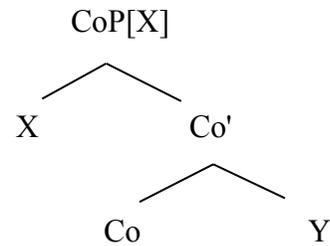
(2) “**BP structure**”

(Munn 1993)



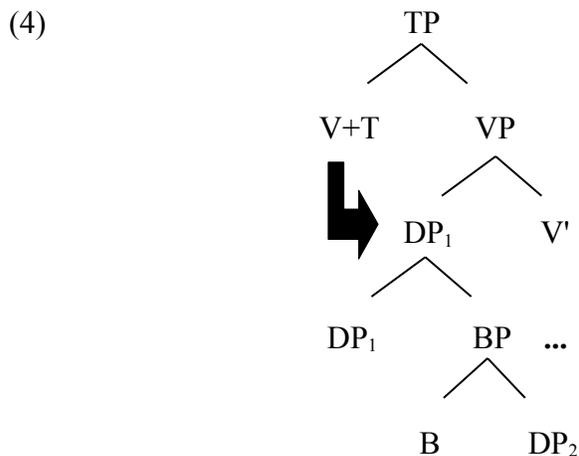
(3) “**spec-head structure**”

(Johannessen 1996, 1998)



Below I describe how CCA has been taken as a diagnostic for such an asymmetric structure of coordination (as (2) or (3) above). Since we get CCA with the first conjunct in Arabic, the verb must have access to the first conjunct or its features. This, according to Munn (1993), is possible in the structure (2) above, where the BP (the phrase consisting of the conjunction particle as head

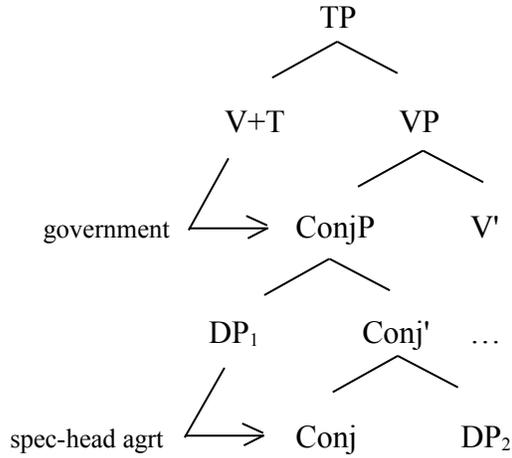
and the rightmost conjunct as its complement) is Chomsky-adjoined to the other conjunct that is structurally prominent. The verb can head-govern the specifier of its complement (exceptional government) under the configuration in (4) below and establish the agreement relationship with the coordination phrase DP₁, resulting in the CCA.⁴⁰



For Johannessen (1996, 1998), the verb gets access to the features of the first conjunct in the following manner. Since coordination has the spec-head structure as mentioned in (3) above, the ConjP acquires the features of the conjunct in its specifier through spec-head agreement relation followed by feature percolation from the head Conj to the ConjP. Since the ConjP has the syntactic features of the first conjunct, when the verb agreement takes place under government with the ConjP as in (5) below, it shows the features of the first conjunct (thus first conjunct agreement). The conjunct in the complement position does not provide its features to the ConjP because it is not in a spec-head agreement relationship with the conjunction particle.

40 Since Minimalism dispenses with government as a crucial notion, Munn (2000) suggests that we can think of it in terms of Attract F or Agree without movement in the current framework.

(5)



Although Munn (1993) and Johannessen (1996, 1998) use different mechanisms for CCA (about how the whole coordinated phrase gets the features of the first conjunct) and slightly different structures for coordination (BP-adjunction or spec-head structure), the common theme of both of the above analyses is that since CCA is able to access the first conjunct or its features, the first conjunct must be structurally more prominent than the other conjunct, thus we have an asymmetric structure of coordination with first conjunct higher or more prominent than the second.

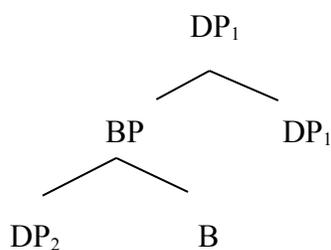
Having discussed how the CCA has been taken as a diagnostic for the structure of coordination using head initial language as an example, let's now turn to the head final language Hindi. As was mentioned in chapter 1 above, Hindi shows last conjunct agreement. This is illustrated in (6) below.

(6) maiM-ne ek chaataa aur ek **saaRii** khariid-ii
I-Erg an umbrella.MSg and a saaree.FSg buy-Perf.FSg
'I bought an umbrella and a saree.'
(Kachru 1980)

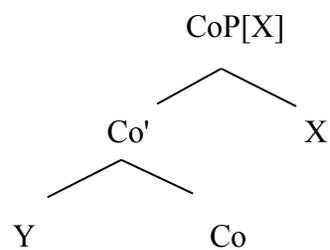
If CCA can be used as a diagnostic for the structure of coordination (as has been used in the

above two analyses), and head initial languages indeed have a head initial structure (with the first conjunct higher/prominent than the second), then the implication for the head final languages (which show last conjunct agreement) is that head final languages would have a head final structure of coordination (with the last conjunct higher/prominent than the first). Thus according to Munn (1993) and Johannessen (1996, 1998), the head final languages would have the structures as in (7) and (8) respectively. Notice in (7), the BP-adjunction takes place to the left as is expected (in head final languages). As a result the entire coordinated phrase is a projection of the last conjunct, hence CCA with the last conjunct. In (8), the specifiers appear on the right of the head, thus CCA with the last (rightmost) conjunct (X). Also notice that the conjunction head Conj appears to the right of the second conjunct (Y), which is consistent with a head-final structure.

(7) “BP structure”



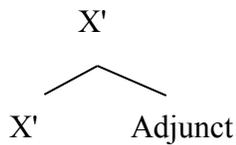
(8) “spec-head structure”



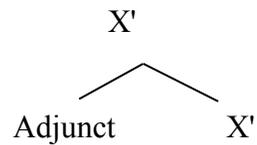
In this section, I have shown how CCA has been taken as a diagnostic for the structure of coordination (based on head initial languages). Also I mentioned what this implies for the structure of coordination for a head final language Hindi. Now in the next two sections, I identify a few other diagnostics for the structure of coordination for head initial languages, and test the structure of coordination in head final language Hindi that CCA predicted with respect to these diagnostics (when relevant). But before we move to the other diagnostics, let me take a short

detour to mention that the BP-adjunction structure seems to be better than the spec-head structure for empirical and theoretical reasons. First of all notice that the adjunction structure gives us the correct word order for both the languages (head initial and head final) without any stipulations, whereas the spec-head structure does not.⁴¹ Notice that usually the adjuncts in head initial languages are right-adjoined as in (9) whereas in head final languages, they are left-adjoined as in (10) below.

(9) **Head initial languages**

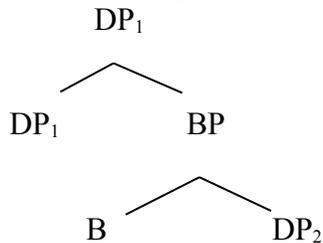


(10) **Head final languages**



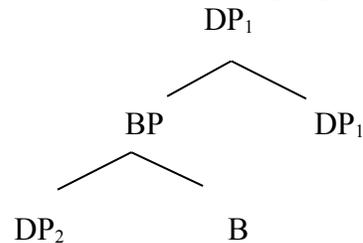
Thus when BP is right-adjoined to the first conjunct as [B Conjunct₂] in head initial languages, or is left-adjoined to the first conjunct as [Conjunct₂ B] in head final languages, it automatically generates the correct word order [Conjunct and Conjunct] observed in both the languages, see (11) and (12) below.

(11) **Head Initial languages**



[Conjunct & Conjunct]

(12) **Head final languages**



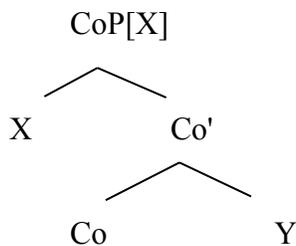
[Conjunct & Conjunct]

The spec-head structure, however, is problematic with respect to the word order. Notice that in head initial languages, the specifier appears to the left of the head, whereas the complement

41 However see section 3.3 below where I show that the structure of coordination in head final Hindi is in fact head initial only.

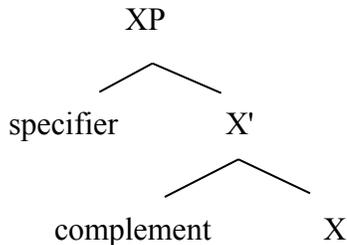
appears to the right of the head giving us the observed word order [Conjunct and Conjunct] as in (13). However, in head final languages, such as Hindi, we see that in all other phrases the specifier as well as the complement appear to the left of the head as in (14a). But with respect to coordination, we would need to stipulate that the specifier appears to the right of the head specially for the coordination head to give us the observed word order [Conjunct and Conjunct] as in (14b).

(13) **Head Initial languages**

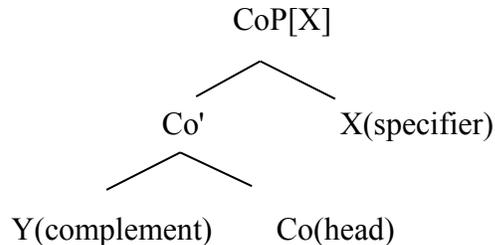


(14) **Head final languages**

(a) **other phrases**



(b) **Coordinated Phrase**



Also as I discuss in chapter 5 below that for the spec-head structure, Johannessen needs to stipulate for the coordinated phrase the percolation of categorial features to the CoP, notice that the categorial features do not percolate up. Similarly to account for the full agreement under the Johannessen's spec-head structure analysis, her head Co needs to be specified for plural feature for the full agreement, but it is not specified in the CCA cases. Thus the heads, in the two cases (FA and CCA), need to be assumed to have different nature (be specified for plural in FA cases

and not for CCA cases). Thus we see that among the two structures of coordination, the BP-adjunction structure seems better as it does not need to make special stipulations that the spec-head structure would need. Let us now turn to the other diagnostics for the structure of coordination.

3.2. Other Diagnostics for the Structure of Coordination

A number of arguments have been advanced to support the asymmetric structure of coordination in the literature besides CCA. The evidence comes from Binding, extraposition (Munn 1993), cliticization and prosody (Munn 1993, Ross 1967), unlike category coordination (Johannessen 1996, 1998, Munn 1993), and Wh extraction with gaps and resumptive pronouns (Munn 2000, Roberts 1999). In this section, I summarize these arguments together with relevant examples. Let's go through each of these arguments now.

Binding facts and c-command: The strongest evidence, according to Munn (1993), in favor of the BP structure and against the flat structure of coordination comes from the binding facts as discussed below. It is observed that a quantifier in the first conjunct can bind a variable in the second conjunct as in (15a) below, however if the quantifier is in the second conjunct and the bound variable in the first conjunct, the sentence is not grammatical, as in (15b).

(15) (a) Every man_i and his_i dog went to mow a meadow.

(b) * His_i dog and every man_i went to mow a meadow.

Since binding is assumed to involve c-command relationship, it seems that the quantifier can c-command the bound variable in (15a), i.e. when in the first conjunct, but it cannot c-command

the bound variable when it is in the second conjunct (15b). This suggests that the structure is asymmetrical, and the first conjunct is higher in the structure than the second conjunct, there is an intervening branching node between the conjuncts.⁴²

Progovac (1997) argues that the difference between (15a) and (15b) is not due to c-command but due to the Leftness Condition (Chomsky 1973) as stated in (16) below. To show that the binding facts in (15) are not a result of violation of the Leftness Condition, Munn (1993) provides even further evidence using R-expressions also binding the pronouns when they are in the first conjunct and not when they are in the second conjunct. This is exemplified in (17). Thus we see that the ungrammaticality in (15b) is not due to the Leftness Condition since it is not restricted to the quantifiers in the second conjunct as being the antecedents of the pronoun in the first conjunct, even R-expressions in the second conjunct cannot act as the antecedents for the pronoun in the first conjunct.

(16) *Leftness Condition*: A pronoun may not be interpreted as a bound variable of a quantifier when it is to the quantifier's left.

(17) (a) John_i's dog and he_i/him_i went for a walk.

(b) * He_i and John_i's dog went for a walk.

Also note that the sentences in (17) also suggest that the structure of coordination is asymmetric, since if it were a flat structure, then not just (17b) but also (17a) would be expected to be ungrammatical as both would violate Principle C of the Binding Theory (R-expressions must be free) since in a flat structure both conjuncts can c-command each other and thus should be able to bind each other.

⁴² Note that here even if it were argued that binding does not involve c-command relationship but some other notions of prominence, the results still hold that the first conjunct is in a more prominent position than the second conjunct.

Extraposition: Munn (1993) shows that in head-initial language English, the second conjunct can extrapose but the first conjunct may not. Thus there is an asymmetry between the two conjuncts, this points to an asymmetric structure of coordination involving the two conjuncts instead of the flat structure. This argument also provides a suggestive evidence that the BP structure is the correct structure rather than the spec-head structure of coordination.

- (18) (a) John bought a book yesterday, and a newspaper.
- (b) * John bought a newspaper yesterday a book and.
- (c) * John bought a book and yesterday, a newspaper.

The grammaticality of (18a) and ungrammaticality of (18c) suggests that the second conjunct “a newspaper” and the conjunction “and” must move as a whole. Thus they seem to make a constituent. Also the ungrammaticality of (18b) shows that the first conjunct “a book” and the conjunction “and” cannot be extraposed together, thus they do not seem to make a constituent together at the exclusion of the second conjunct. This suggests that the coordination structure is asymmetric with the first conjunct structurally higher than the second conjunct which forms a constituent with the conjunction head.

As mentioned above, according to Munn (1993), this example additionally provides evidence that the second conjunct and the conjunction head make a maximal projection (thus evidence for the BP structure of coordination), since if extraposition is a movement rule, it is predicted to be only applied to the maximal projections. If it is just an interpretive rule, then, according to Munn, it is even more likely that it is a maximal projection, otherwise we would expect other non-maximal projections also to be extraposed which is not found to be the case.

Cliticisation: Ross (1967) illustrated through the following examples from German that in

languages that allow the conjunctions to encliticize, the enclitics are always inserted into the following conjunct. The conjunction “aber” 'but' can cliticize into the second conjunct as in (19b), but its cliticization to the first conjunct is not possible as in (19c). This also points towards the asymmetry between the first and the second conjunct (Ross 1967, Munn 1993).

(19) (a) Sie will tanzen, aber ich will nach Hause gehen.

'She wants to dance, but I want to go home.'

(b) Sie will tanzen, ich will aber nach Hause gehen.

(c) * Sie will aber tanzen, ich will nach Hause gehen.

Prosody - intonational pauses: Ross (1967) showed that there was syntactic evidence suggesting towards the constituency of the conjunction and the second conjunct based on the intonational pauses that were only found to be possible after the first conjunct, see the English data below (Munn 1993, originally Ross 1967). The sentence (20c) is not possible since it assumes that the first conjunct “John left” can make a constituent with the conjunction “and” and thus an intonational pause should be possible between this constituent and the second conjunct. On the other hand, acceptability of (20a) and (20b) both suggests that the conjunction “and” can make a constituent with the second conjunct “he didn't even say good-bye”, the first conjunct is a separate constituent, that is why an intonational pause is possible between the first conjunct and the other constituent (conjunction together with the second conjunct). This suggests that the first conjunct is higher than the second conjunct (and that the second conjunct forms a constituent together with the conjunction head).

(20) (a) John left, and he didn't even say good-bye.

(b) John left. And he didn't even say good-bye.

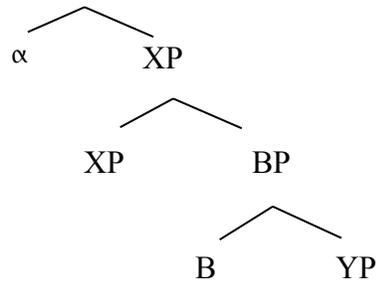
(c) * John left and. He didn't even say good-bye.

Asymmetric (unlike category) coordination: Munn (1993) provides data to suggest that the second conjunct plays no role in determining the syntactic behavior of the conjunct pair (thus there can be coordination of two unlike conjuncts, although semantics might restrict the possibilities). He suggests that this is because only the first conjunct is in a position to be selected. Thus again this is an argument favoring the asymmetry in coordination, and more specifically the BP structure and it is an argument against the spec-head structure as well as the flat structure of coordination. For example, he shows that there are ordering restrictions on the conjuncts with an ECM verb *expect*, see (21) below. This provides an evidence for an asymmetrical coordination structure. Notice the order of ECM and CP conjuncts. (21a) shows that the order where the first conjunct involves ECM and the second a CP conjunct is acceptable, but the reverse order is not acceptable as in (21b).

- (21) (a) John expects Perot to run and that he'll vote for him
(b) * John expects that Perot will run and Bill to vote for him
(c) John expects Perot to run and his wife to vote for him

This is because there are different licensing requirements for ECM and CP clauses. The subject of the ECM clause must receive case under government by the selecting verb. If the first clause is ECM, it can get the case from the verb (21a). But if the second clause is the ECM as in (21b), and the case is not assigned to the first clause subject, then it cannot be exceptionally assigned to the subject of the second conjunct. If the subject of the first ECM conjunct clause gets the case, then the subject of the second conjunct ECM clause can also get the case (21c). Munn suggests that if the coordination structure is asymmetric (22), we can expect these facts with the stipulation in (23).

(22)



(23) In a structure like (22), if α assigns θ to XP then B may assign θ to YP.

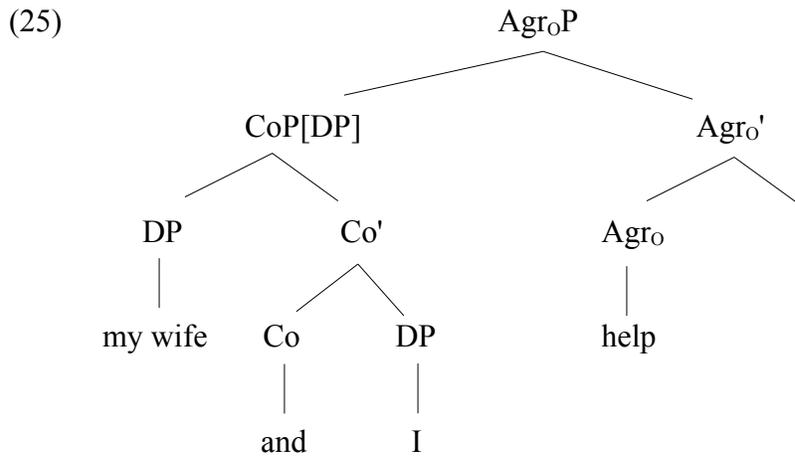
Also refer to Johannessen's (1998) “unbalanced coordination” where the order of conjuncts is crucial as the coordination is acceptable only in one order [X & Y] but not the other order *[Y & X]. This, according to Johannessen, is an indication for the structure of coordination where the first conjunct is able to be in a configuration with outside licensors to fulfill some requirements, e.g. feature checking, but the second conjunct is not due to a lower position. For example, consider the case marking on the first and the second conjunct in (24) below.

(24) Can someone help [my wife and I] find housing in Texas ...?

According to Johannessen, the absence of the expected case on the second conjunct in (24) can easily be explained in the framework of the minimalist program.⁴³ In this approach, case is a spec-head relation between two positions, e.g. verb in a relevant Agr-position and (a DP) in spec, Agr position. For the example in (24), see the tree in (25) below. Here the CoP[DP] gets case from the verb “help” through spec-head agreement since it is in [spec, Agr_o] position. The features are inherited by the head Co. As a result the specifier of Co (the first conjunct) gets the same features via spec-head agreement with the Co. The complement does not get these features

43 She also mentions other possible explanations (although discards them in favor of the explanation based on the framework of the minimalist program), e.g. in terms of Chomsky's (1986) definition of government, or Rizzi's (1990) relativized minimality, however I do not discuss all of these here, refer to Johannessen (1998) for further details.

since it does not take part in the spec-head agreement.



Thus we see that the unbalanced coordination can be taken as a diagnostic for the structure of coordination.

Wh- movement: gaps and resumptive pronouns: Using examples from an earlier stage of Modern English, Roberts (1999) suggests that resumptive pronouns display an asymmetric behavior depending on which conjunct they appear in. Whereas in Present Day English (PDE), only the gaps are allowed in both the conjuncts, in the earlier stage, the resumptive pronouns were allowed, but only in the second conjunct. Following Johannessen, he assumes that the asymmetry is due to the hierarchical relations (one conjunct being a specifier of conjunction and the other a complement). He suggests that extraction of the wh-phrase can take place from the first conjunct as its features are projected onto the CoP, as a result of which the first conjunct becomes transparent for extraction. Another alternative may be that the [spec, CoP] and CoP are equidistant from the [spec, CP], thus both can be targeted by wh- movement. But extraction/wh-movement from the second conjunct is not possible and hence a resumptive pronoun was

required for extraction. Note it is possible to get gap in both the conjuncts which is a case of balanced coordination (or across-the-board extraction). The example (26a) shows that the resumptive pronoun was required in the second conjunct in the earlier stage of English, where in PDE a gap is expected, see the bold part. The examples Roberts provides are taken from Swift's *Gulliver's Travels*. Example (26b) shows the across-the-board extraction option used in the PDE.

- (26) (a) There was also another Kind of *Root* very *juicy*, but something rare and difficult to be found, which [the *Yahoos* sought for with much Eagerness, and would suck **it** with great Delight ...] (An earlier stage of English)
- (b) There was also another kind of root very juicy, but something rare and difficult to be found, which_i [the *Yahoos* sought for e_i with much eagerness, and would suck e_i with great delight ...] (PDE)

Thus, looking at (26a) and absence of an equivalent where the resumptive pronoun appeared in the first conjunct, we can say that we have an asymmetric structure of coordination (in the earlier stage of English mentioned here) where the first conjunct is higher than the second conjunct following Roberts' line of argumentation.

Let's now consider from among the diagnostics mentioned above the ones which are relevant for Hindi to determine the structure of coordination in Hindi.

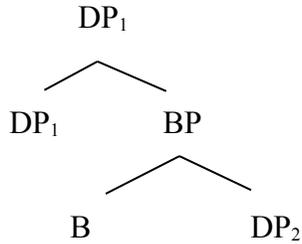
3.3. The Structure of Coordination in Hindi: Head Initial Asymmetric Structure

The structures given in (2) and (3) in section 3.1 above, repeated here as (27a) and (27b), with leftmost conjunct in a structurally more prominent position than the other conjunct, represent the head initial languages. In a head final language, a head final structure is expected, with the rightmost conjunct in a structurally prominent position as in (7) and (8) above, repeated here as

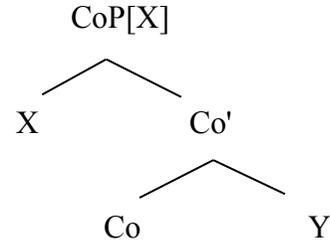
(28a) and (28b) corresponding to the head initial (27a) and (27b).

(27) Head initial structure of coordination

(a) “BP structure”

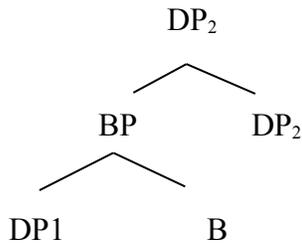


(b) “spec-head structure”

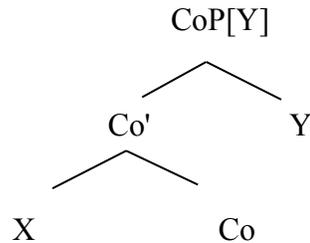


(28) Head final structure of coordination

(a) “BP structure”



(b) “spec-head structure”



However below I apply the diagnostics for the structure of coordination mentioned in section 3.2 above to Hindi and show that the head final Hindi in fact has the head initial asymmetric structure of coordination, as in (27a) or (27b).

Binding: As we saw for head initial English, binding provides us with an evidence for the asymmetric head initial structure of coordination even in head final Hindi. If Hindi had a head final structure of coordination, we would expect the quantificational phrase (QP) in the right-most conjunct to bind the bound pronoun in the first conjunct according to (28) above. On the other hand, if Hindi has a head initial structure of coordination, then we expect the QP in the left-most conjunct to bind the bound pronoun in the second conjunct according to (27) above. Let's

look at the Hindi data in (29) below. As can be seen in (29a), the left-most QP conjunct binds the bound pronoun in the second conjunct, but the QP in the second conjunct in (29b) does not bind the bound pronoun in the first conjunct. This indicates that first conjunct is syntactically more prominent than the second conjunct in Hindi too.

- (29) (a) **har aadmii_i** aur **us_i-kaa** kuttaa bazaar gayaa
 every man and his dog market went
 'Every man and his dog went to the market.'
- (b) * **us_i-kaa** kuttaa aur **har aadmii_i** bazaar gayaa

Again, just like English, this is not merely due to the violation of the Leftness Condition (Chomsky 1973) that states that a pronoun may not be interpreted as a bound variable of a quantifier when it is to the quantifier's left. This is shown by the following data using R-expressions which also bind the pronouns when they are in the first conjunct and not when they are in the second conjunct. This is exemplified in (30) below.

- (30) (a) **John_i-kaa** kuttaa aur **vo_i** bazaar gaye
 John's dog and he market went
 'John's dog and he went to the market.'
- (b) * **vo_i** aur **John_i-kaa** kuttaa bazaar gaye

The sentences in (30) suggest that the structure is asymmetric, since if it were a flat structure, then not just (30b) but also (30a) would be expected to be ungrammatical as both would violate Principle C of the Binding Theory (R-expressions must be free.) since in a flat structure both conjuncts can c-command each other and thus should be able to bind each other. Thus from these examples also, it is clear that one of the conjuncts can asymmetrically c-command the other and thus bind it, and that it is the first conjunct that can asymmetrically c-command the second

conjunct. Thus the binding & c-command facts in (29) are consistent with the structures of coordination in (27), where the first conjunct asymmetrically c-commands the second conjunct.

Extraposition: As Munn (1993) had shown for head initial English that the extraposition facts argue for a head initial asymmetric structure of coordination, if Hindi had a head final structure, we would predict a certain behavior of extraposition in Hindi. If the structure is head final, then, according to (28) above, the first conjunct should be able to be extraposed together with the conjunction particle (forming a constituent) but the second conjunct should not. However, looking at Hindi facts, we find that the first conjunct does not extrapose together with the conjunction, see ungrammatical (31c) below. Hence, the first conjunct and the conjunction particle do not form a constituent that excludes the rightmost conjunct, just like head initial English. Also, like English, even in Hindi, the second conjunct can extrapose together with the conjunction as a unit and thus forms a constituent, see (31b). Similarly, the second conjunct cannot extrapose leaving the conjunction behind as in (31d). This suggests that the second conjunct and conjunction particle constitute a maximal projection under the assumption that only maximal projections can undergo displacement.

- (31) (a) John-ne kal **ek kitaab aur ek magazine** khariidi
 John yesterday **one book and one magazine** bought
 'Yesterday John bought a book and a magazine.'
- (b) John-ne kal **ek kitaab t** khariidii, [**aur ek magazine**]
 'Yesterday John bought a book , and a magazine.'
- (c) * John-ne kal **t ek magazine** khariidii, [**ek kitaab aur**]
 'Yesterday John bought a magazine, a book and.'
- (d) * John-ne kal [**ek kitaab aur**] **t** khariidii, [**ek magazine**]
 'Yesterday John bought a book and , a magazine.'

Thus, the movement facts in the context of Hindi coordination suggest that the conjunction particle and the rightmost conjunct form a constituent that can exclude the leftmost conjunct, which is expected under a head initial structure of coordination as in (27) above.

Prosody - Intonational Pauses: As pointed out by Ross (1967), and discussed in Munn (1993), an intonational pause is more natural after the first conjunct than after the conjunction particle in English, which is consistent with the head initial asymmetric structure of coordination in (27) above. The following Hindi data in (32a) also shows that an intonational pause can occur after the first conjunct, however it cannot occur after the first conjunct and the conjunction, treating them as one unit as in (32b). This shows that the second conjunct and the conjunction particle form a constituent (with (27) being a representative structure), not the first conjunct and the conjunction particle as would have been the case if Hindi had a head final structure of coordination (as in (28)).

- (32) (a) [john ga-yaa] . [aur [us-ne bye bhii nahiiM kah-aa]]
 John went and he bye also not said
 [CONJUNCT-1] PAUSE [CONJUNCTION [CONJUNCT-2]]
 'John left, and he didn't even say good-bye.'
- (b) * [[john ga-yaa] aur] . [us-ne bye bhii nahiiM kah-aa]
 [[CONJUNCT-1] CONJUNCTION] PAUSE [CONJUNCT-2]
 'John left and. He didn't even say good-bye.'

Thus, the prosody of coordination also points to an asymmetric structure in Hindi with the conjunction particle and rightmost conjunct forming a unit. Thus this diagnostic also suggests that Hindi has a head initial structure of coordination as in (27) rather than head final as in (28).

Wh- movement: gaps and resumptive pronouns: As was mentioned in the previous section, Roberts (1999) used the asymmetric behavior of the resumptive pronouns depending on which conjunct they appear in as a diagnostic for an asymmetric head initial structure of coordination in an earlier stage of English. He noticed that the resumptive pronoun only appeared in the second conjunct. He explained it suggesting that wh-extraction was possible from the first conjunct as its features could project onto the CoP due to spec-head agreement with Co. But extraction from the second conjunct was not possible as the second conjunct, being a complement of Co, could not participate in spec-head agreement with Co, thus the second conjunct required a resumptive pronoun for extraction to take place. Just like the examples from English in the previous section, Hindi also shows that the resumptive pronoun can appear in the second conjunct, see (33a). The ungrammaticality of (33b) shows that it does not appear in the first conjunct. Just like in English, it is possible to get gap in both the conjuncts (across-the-board extraction), see (33c).

(33) (a) maiM roz ek laRkii se mil-taa huuM
 I everyday one girl with meet-Hab.MSg be.1MSg
 jisko [maiM gaNit paRhaa-taa huuM,
 whom.ACC I maths teach-Hab.MSg be.1MSg
 aur **us-ko** bahut pasaMd kar-taa huuM]
 and her-ACC very like do-Hab.MSg be.1MSg

'Everyday I meet with a girl, who [I teach maths, and like **her** very much].'

(b) * maiM roz ek laRkii se mil-taa huuM
 I everyday one girl with meet-Hab.MSg be.1MSg
 jisko_i [maiM **us-ko** gaNit paRhaa-taa huuM,
 whom.ACC I her.ACC maths teach-Hab.MSg be.1MSg
 aur bahut pasaMd kar-taa huuM]
 and very like do-Hab.MSg be.1MSg

'Everyday I meet with a girl, who [I teach her maths, and like very much].'

(c) maiM	roz	ek laRkii se	mil-taa	huuM	
I	everyday	one girl with	meet-Hab.MSg	be.1MSg	
jisko _i	[maiM	e _i	gaNit	paRhaa-taa	huuM,
whom.ACC	I	maths	teach-Hab.MSg	be.1MSg	
aur e _i	bahut	pasaMd	kar-taa	huuM]	
and	very	like	do-Hab.MSg	be.1MSg	

'Everyday I meet with a girl, who [I teach maths, and like very much].'

Thus, looking at (33a) and (33b), we can say that the first conjunct is higher than the second conjunct in Hindi too just like English following Roberts' line of argumentation. Hence Hindi also seems to have the head initial structure as in (27) rather than the head final structure as in (28) above.

The cliticization argument cannot be used to test the structure in Hindi as the conjunction does not encliticize in Hindi. Also the asymmetric unlike category coordination/unbalanced coordination diagnostic could not be used as, for example, with respect to case marking, we find that the coordination is balanced, i.e. both the conjuncts show the same case marking, it is not possible in Hindi for one of the conjuncts to show one case marking while the other conjunct to not show it. This can be seen from the following examples in (34). Notice that the grammatical examples in (34a) and (34c) involve both conjunct to show the overt Accusative case marking (with postposition “ko”). The ungrammatical (34b) shows that it is not possible for the first conjunct show nonovert Accusative case marking and the second conjunct to show overt Accusative case marking. Similarly ungrammatical (34d) shows that it is not possible for the first conjunct to show overt Accusative case marking, while the second conjunct to show nonovert Accusative case marking. As was mentioned in chapter 2 above, the object NP needs to move up

to the EncP for overt Accusative case marking, the following examples show that neither the first conjunct nor the second conjunct can move up leaving the rest of the coordination in-situ. Thus we cannot use this diagnostic in Hindi to determine the structure of coordination.

(34) (a) kyaa tum vahaam se us-ko aur mujh-ko dekh paa rahe ho
 Yes/NoQPrtcl you there from that.Acc and I.Acc see get Prog be.Pres
overt Acc overt Acc

'Are you able to see that and me from there?'

(b) * kyaa tum vahaam se veh aur mujh-ko dekh paa rahe ho
 Yes/NoQPrtcl you there from that.Acc and I.Acc see get Prog be.Pres
nonovert Acc overt Acc

(c) kyaa tum vahaam se mujh-ko aur us-ko dekh paa rahe ho
 Yes/NoQPrtcl you there from I.Acc and that.Acc see get Prog be.Pres
overt Acc overt Acc

'Are you able to see me and that from there?'

(d) * kyaa tum vahaam se mujh-ko aur veh dekh paa rahe ho
 Yes/NoQPrtcl you there from I.Acc and that.Acc see get Prog be.Pres
overt Acc nonovert Acc

To sum up, the facts from the (applicable) diagnostics for the structure of coordination, namely binding, extraposition, prosody (intonational pause), and wh-extraction with respect to coordination in Hindi suggest that the first conjunct is structurally more prominent than the second, and that the second conjunct forms a constituent with the conjunction particle. This is exactly what we find in English that has a head initial structure of coordination as shown in (27). Thus, based on these diagnostics, it can be concluded that coordination in Hindi also displays a head initial structure with the leftmost conjunct being more prominent than the other syntactically.

However as was mentioned earlier in section 3.1, the CCA facts (last conjunct

agreement) would suggest that the last conjunct is structurally more prominent than the first conjunct, refer the example in (6) above. Also see (35) below borrowed from Davison (1991a).

This would argue for a head final structure of coordination as in (28) above.

(35) Last Conjunct Agreement:

maiM-ne	[us-kaa haar	aur	cuuRii]	pulis-ke	hawaale	kii/*kiyaa	
I-Erg	his	necklace.MSg	and	bangle.FSg	police-of	custody	did.FSg/*MSg
	Coordinated Phrase					V	

'I turned [her necklace and the bangle] over to the police.'

If CCA were indeed a diagnostic for the structure of coordination, then CCA would challenge the conclusion drawn based on all the other diagnostics for the asymmetric structure of coordination since they point in the opposite directions, i.e. the CCA argues for a structure in (28), whereas all the other diagnostics argue for a structure in (27). However note that within Hindi, we also observe another pattern of CCA, the first conjunct agreement if the coordinated phrase is in the postverbal position. This is illustrated in (36) below, also borrowed from Davison (1991a).

(36) First Conjunct Agreement:

maiM-ne	pulis-ke	hawaale	kiyaa/*kii	[us-kaa haar	aur	cuuRii]	
I-Erg	police-of	custody	did.MSg/*FSg	his	necklace.MSg	and	bangle.FSg
			V	Coordinated Phrase			

'I turned [her necklace and the bangle] over to the police.'

If the CCA were a diagnostic for the structure of coordination, then the examples such as (35) and (36) above suggest that we have two different structures of coordination, head final and head initial respectively within the same language. While this may not be impossible, it is not a favorable option for a language to have two different structures for the same phrase. Also since we do not find any other independent evidence for the head final structure of coordination in

Hindi, all the other diagnostics unanimously favor only one of these options, namely a head initial structure of coordination, I take this to mean that the CCA is not an indication for the structure of coordination.⁴⁴ Thus I conclude that Hindi coordination has an asymmetric head initial structure as in (27) above just like head initial English, where the first (left-most) conjunct is in a structurally more prominent position than the last (right-most) conjunct.

However, I do not commit to either the BP-adjunction structure of coordination (as in (27a), or the spec-head structure of coordination (as in (27b) above) at this point, I would like to mention the following. The word order argument, mentioned earlier in section 3.1, in favor of the BP-adjunction structure does not work anymore since the argument was based on the assumption that the head final languages would have a head final structure of coordination, but as we have just seen the head final Hindi does not have a head final structure of coordination but head initial structure. However as I mentioned in section 3.1 above, an account of CCA based on the spec-head structure of coordination needs to make certain stipulations about the categorial features at the maximal phrase (CoP) level. Let me conclude this section by stating that irrespective of whether (27a) or (27b) is the correct structure for coordination in Hindi, the structure is asymmetric (not a flat structure with all the conjuncts at the same level), with the first conjunct being higher/prominent than the second conjunct. Now, since it looks like the structure of coordination is head initial in Hindi, it makes sense to consider if we have any other evidence for head initial structure in head final Hindi, i.e. if Hindi has any other phrases too with the head initial structure. In the following section, I present some other phrases in Hindi with head initial structure.

⁴⁴ Looking at it in the reverse direction, what this means is that the CCA cannot be analyzed in terms of the structure of coordination. In chapter 5 below, I argue that CCA is an indication for the role that linear adjacency/proximity plays in agreement.

3.4. Presence of other head initial phrases in head final Hindi

In a head initial language, like English, it is not that surprising that the leftmost conjunct is more prominent than the second conjunct since the second conjunct is a complement of the conjunction particle (27b), or the adjunction in a head initial language is right-adjoined (27a). However, as I had mentioned in chapter 2 as well, Hindi is a head final language, in general, with SOV as its canonical word order (Mahajan 1990, Bhatt 2005). See the bolded part in the following example (37), it shows that the noun phrase and similarly the adpositional phrase (PP) is head final in Hindi.

- (37) [_{NP} baccoM kii **maaM**] [_{AdpP} pati **ko**] ghar bulaa-tii hai
[children of **mother**] [husband **Acc**] home call-Hab Pres
[N POSS N] [N P]
'The children's mother calls the husband home.'

Despite the fact that phrases such as NP, VP, PP, AdjP are head final in Hindi, we also find phrases which do indeed show a head initial structure.⁴⁵ Here I mention some of these phrases. First of all, with respect to the coordination phrase itself, besides the evidence we looked at in section 3.3 above, Davison (2006) also mentions that languages with relative pronouns also have initial conjunctions, thus a head initial structure of coordination. Here it should be noted that Hindi does have relative pronouns. This is illustrated in the following examples, see the relative pronoun in bold.

⁴⁵ The presence of other head initial phrases in Hindi (which also I have included below) was also pointed out to us by an anonymous reviewer for the squib from which most of the content for this chapter is taken from.

(38) (a) us laRkii kii bahan aam khaa rahii hai
 that girl of sister mango eat Prog be.Pres
jo kal yahaaM aayii
who tomorrow here come-Perf
Rel

'The sister of the girl who came here yesterday is eating the mango.'

(Donaldson 1971, modified for consistency)

(b) vah koun thaa **jis** ko tum ne patra bhejaa thaa
 he who be.Pst **who** Acc you Erg letter send-Perf be.Pst
Rel

'Who was that to whom you sent the letter?'

(Shapiro 1989, modified for consistency)

Thus based on the above typological statement of Davison's (2006), we expect the conjunction in Hindi to be initial, thus a head initial structure of coordination. Below I provide examples for a few other phrases.

The Complementizer Phrases (CP) are head initial in Hindi, an example is provided in (39) below (Davison 2006: 3, further examples are provided in Kumar 2006: 16).

(39) use (yeh) maalum hai [**ki** [_{TP} ve aa rahe haiM]
 to him this known be.Pres **Comp** [they come Prog be.Pres
 'He/she knows [that they are coming].'
 (modified for consistency)

The Demonstrative Phrase is also head initial in Hindi. Notice the demonstrative head takes its complement NP to the right in the following example (40). Also refer to Bhatt (1996), note he uses head initial position for demonstratives in all the examples.

(40) (a) [_{DP} **vo** [_{NP} kitaab [_{CP} jo sale par hai]]] acchii hai
that book which sale on be.Pres good be.Pres
Dem

‘That book is good which is on sale.’

(borrowed from Bhatt (2003), modified for consistency)

Similarly the conditionals (41) and the “because” phrases (42) in Hindi are head initial, see the bold part in the following examples which take their complement to their right.

(41) [**agar** [_{TP} tum abhii nahiiM jaa-oge]], to samay par nahiiM pahuMc-oge
if you right now not go-Fut then time on not reach-Fut
Condl

'If you do not go now, you will not reach on time.'

(42) maiM vahaam nahiiM gayaa [**kyuMki** [_{TP} mujhe bahut kaam thaa]]
I there not go-Perf **because** I.Dat a lot work be.Pst
'I didn't go there because I had a lot of work.'

Thus we see that there are many phrases such as CP, DP, Conditional Phrase, “because” phrase etc which are head initial in Hindi. Hence the structure of coordination arrived at in section 3.3 above is not an unreasonable or impossible structure for Hindi grammar.

3.5. Summary

In this chapter, I have shown that Hindi has a head initial structure of coordination rather than a head final structure based on diagnostics such as binding, extraposition, prosody and wh-extraction. That this structure is a viable configuration is supported by the fact that Hindi also has a few other phrases which also seem to have a head initial structure despite the fact that phrases such as noun phrase, verb phrase, adposition phrase etc are head final in Hindi. I also

suggested that CCA should not be taken as a diagnostic for the structure of coordination, and thus it should not be analyzed in terms of the structure of coordination. I will discuss, in some detail, the possible analyses of CCA in the following chapter, the clausal coordination analysis in section 4.1, and the phrasal coordination analysis (of which Johannessen's and Munn's accounts discussed in section 3.1 above were illustrations) in section 4.2.

4. *ANALYSES FOR AGREEMENT IN THE CONTEXT OF COORDINATION*

In the context of coordination, two agreement patterns have been observed in some languages, as was mentioned in chapter 1 above, the full agreement (FA) and the closest conjunct agreement (CCA). The FA pattern is observed in all languages and there is not much disagreement among the linguists as far as its analysis is concerned (at least in the clear phrasal coordination cases); the whole coordinated phrase has the features as a result of resolution of the conjuncts' features, and the verb agrees with this whole coordinated phrase. However FA gets interesting with cases that seem to involve clausal coordination because there full agreement is not expected (as each clause' predicate is expected to Agree within its own clause) and no relation of agreement so far can account for full agreement there, a systematic study of this phenomenon may shed some light on how agreement is achieved in such clausal coordination cases. Similarly the problem of CCA is significant, CCA has been observed in head initial languages in the literature, however it is not restricted to just the head initial language, even head final languages show CCA. The analyses of CCA are divided into two classes: (i) analyses involving clausal/propositional or a higher (than NP/DP) category coordination, such as ABS (1994), and (ii) analyses involving NP/DP coordination, termed as phrasal coordination, such as Munn (1999). In this chapter I focus on this second problem, the CCA; and I leave the problem of FA observed in the clausal coordination constructions mentioned above for future work.

Below I present the analyses of CCA belonging to both of the above mentioned classes (the clausal coordination and the phrasal coordination). And I show that the clausal coordination analyses of CCA face many theoretical and empirical problems. Most of the phrasal coordination analyses assume the structure of coordination and the word order of the language to play a role in the CCA. I argue against these phrasal coordination analyses as I show that the Hindi data do not support such an analysis.⁴⁶ Finally I argue in favor of the kind of phrasal analysis that involves the role of both the syntactic component (the structural relationship of agreement between the probe and the goal) as well as the PF component (the linear proximity and the presence of intervening material between the probe and the goal) in CCA.⁴⁷

4.1. Clausal (/Propositional) Coordination

Hudson (1970) mentions that many of the sentences containing two or more conjoined phrases correspond in meaning to sentences containing conjoined clauses. This is shown through his examples in (1) below, note (1a) and (1b) have the same meaning.

(1) (a) John and Mary wore glasses.

(b) John wore glasses and Mary wore glasses.

He mentions that this fact has been recognized for a long time, e.g. Beauzée (1767) as quoted in Chomsky (1966: 46). Although linguists, such as Curme (1935: 93), Lakeoff & Peters (1966), recognized that there also exist sentences containing conjoined phrases which do not have expanded sentences with conjoined clauses, see (2) below, it seems that the conjunction of phrases was being taken as sentential/clausal unless there was a reason for it to be treated as

46 At various points I will also mention another head final language Tsez, refer to BBP (2009) for the Tsez data.

47 The ideas were first introduced in BBP (2009) and Benmamoun & Bhatia (2010), I present them here and further revise them based on additional data from Hindi.

phrasal.⁴⁸

(2) (a) The King and the Queen are an amiable pair.

(b) * The King is an amiable pair and the Queen is an amiable pair.

According to Hudson, this treatment of the conjunction of phrases (i.e. clausal coordination as default) could be due to the historical development of transformational grammar description of coordination suggested by Chomsky (1957), which was further carried by Gleitman (1965) etc.⁴⁹ Thus, among the syntactic analyses, true phrasal coordination was taken as a marked construction, most of the conjunction of phrases being taken as underlyingly sentential/clausal coordination.⁵⁰ Under this backdrop, it seems reasonable to consider sentences involving CCA as involving clausal coordination.⁵¹

48 Lasersohn (1995) discusses previous semantic analyses to account for the difference between the sentences similar to those in (1a) and (2a) in the main text here. Besides other things, these analyses differ on what the Logical Forms (LFs) for these sentences would be. For example, the NP/S Analyses assume that both types of sentences have two non-equivalent LFs, one of which is identical to the surface structure, and the other consists of conjoined clauses as in (1b) and (2b) above. Why sentences like (2a)'s conjoined clause LFs do not work is because the predicates in such sentences as (2a) require groups in their extension rather than individuals, according to the NP/S Analysis. Similarly the NP/NP Analyses assume that both types of sentences have the surface conjoined NPs as the conjoined NPs in their LFs too, i.e. there are no conjoined clauses in the LFs even for the sentences with distributive readings such as (1a). Lasersohn argues for an analysis where the conjunction is always group-forming, the LFs do not involve conjoined clauses for sentences such as (1a), rather the distributivity results due to a hidden variable over events (the “D-operator”) which the predicates contain an argument place for. Thus he argues for the “LF Preference Strategy”, which states that if everything else is equal, then an analysis which assumes the least difference between the surface structure and the LF is to be preferred over other analyses. Thus sentences such as (1a) and (2a) would have the same LFs as their surface representation except that in (1a), the predicate would have the “D-operator”, whereas (2a) would not have it.

49 Chomsky (1957: 35) suggested a way of generating the sentential/clausal type coordination. He mentioned that if we have two sentences of the form $Z + X + W$ and $Z + Y + W$ (and if X and Y are constituents of these sentences), then we can generally form a new sentence $Z - X + \text{and} + Y - W$. Thus he extended the PS component to allow collapsing two or more sentential PS-markers if they shared constituents. Gleitman (1965) took this approach and derived all coordination from sentential conjuncts with subsequent ellipsis to reduce the fully-fledged structure to the structure that is overtly present.

50 However, it seems that many of the accounts for the clausal coordination vs phrasal coordination, such as the accounts proposed by Dik (1968), Dougherty (1970), Hudson (1970) and McCawley (1968) are instead accounts for distributive reading vs collective reading. See Appendix B where I present their accounts briefly, which I suggest could in fact explain the distributive vs collective readings (within the phrasal coordination).

51 However note that in the following sections (section 4.1.2), I argue that this is not the case and that CCA constructions do not derive from the coordination of clauses, i.e. at least syntactically it is not coordination of clauses.

As is clear from the example (1) above, for the clausal coordination analysis, it is assumed that the sentences with coordination as in (3a) below from Lebanese Arabic, in fact, involve two clausal (IP/TP) conjuncts as in (3b).⁵²

(3) (a)	Neem	Kariim	w	Marwaan	(ABS 1994)
	slept.3MSg	Kareem	and	Marwaan	
	'Kareem and Marwaan slept.'				
(b)	Neem	Kariim	w	neem	Marwaan (ABS 1994)
	slept.3MSg	Kareem	and	slept.3MSg	Marwaan
	'Kareem slept and Marwaan slept.'				

The sentence in (3a) may also be analyzed as involving VP conjuncts instead of the IP/TP conjuncts, i.e. the conjuncts in (3b) above may also have been VPs rather than TPs.⁵³ I group both these kinds of analyses, the literal clausal coordination as well as the VP coordination, together and use the cover term clausal (/propositional) coordination analysis (unless specified) as distinguishing between them is not crucial for our purposes.⁵⁴ If the clausal coordination is assumed, then what we observe in sentences such as (3a) are the fragments rather than the whole

52 The process of deriving structures such as (3a) from apparently their expanded structures such as (3b) is known as Conjunction Reduction. The Conjunction Reduction approaches assume that at some level of representation, reduced conjuncts are larger than they appear at the surface, the reduced structure being a consequence either of base-generation of empty syntactic categories or of (postsyntactic) deletion of base-generated material (Hartmann 2000). Although now Conjunction Reduction is used as a general term as described here to refer to the fact that the structure is reduced, through some process(es), Ross (1967) had given a specific “rule of Conjunction Reduction” which was based on (Right or Left) Node Raising. The (Right) Node Raising is described below in the main text. The rule of Conjunction Reduction that Ross (1967: 97) proposed is as follows: “[Conjunction Reduction] Chomsky-adjoins to the right or left of the coordinate node a copy of some constituent which occurs in all conjuncts, on a right or left branch, respectively, and then deletes the original nodes.” He emphasizes that Conjunction Reduction needs to work Across-the-Board, i.e. the raised constituent must occur in each conjunct.

53 Of course here, due to the Subject Internal VP Hypothesis, we would need to assume that the verb in each of the conjuncts must have moved out of the VP to adjoin to it which leads to the word order VS rather than SV, so instead of literal VP conjuncts, we have [_{VP} V [_{VP} ... t_v]] conjuncts. For simplicity sake, I am calling the adjoined VP conjunct also the VP conjunct here.

54 Hartmann (2000) also groups them together, she uses the term “Large Conjunct Hypothesis” to refer to analyses that assume base-generation of larger structures, such as biclausal structure or conjoined VP structure.

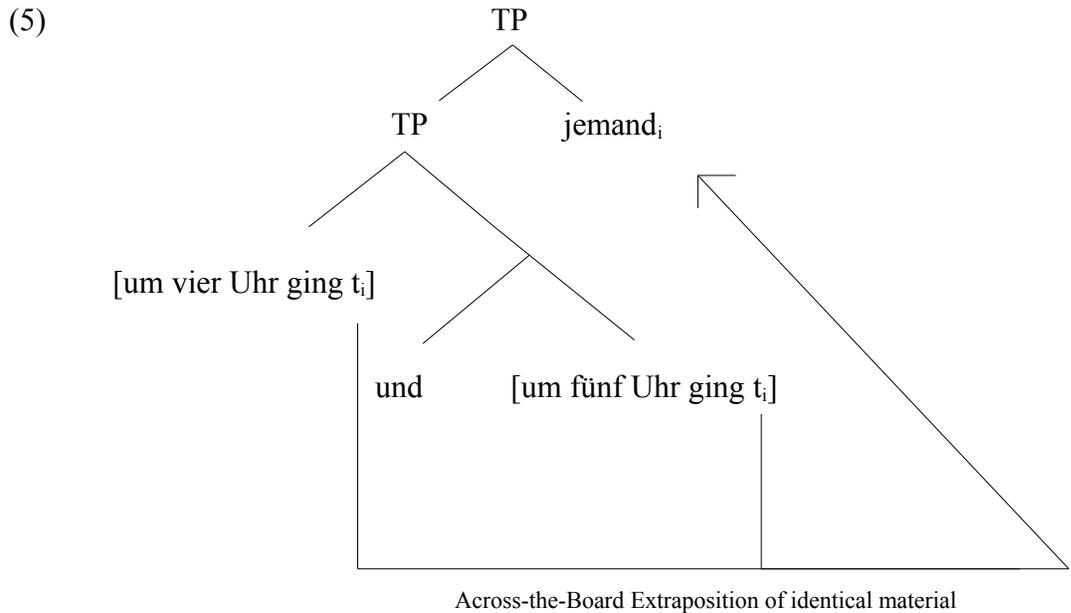
clauses, i.e. all the material except for the visible NP is somehow either removed from one of the clauses or not pronounced overtly, which gives an appearance as if the two NPs (rather than the two clauses) were conjoined. Below I describe three processes that may be taken to be involved in reduction (i.e. in reducing the clauses to fragments), namely, Right Node Raising, gapping, and VP deletion/ellipsis.

4.1.1. Mechanism of Conjunction Reduction (i.e. deriving fragments from the clauses) under the clausal coordination analysis

The mechanism of deriving fragments under the clausal coordination analysis involves one or more of the processes that remove/leave unpronounced all the identical material from the putative conjoined clauses. As mentioned above, in this section, I first describe three of the processes that have been taken to be involved to result in the fragments: Right Node Raising, Gapping, and VP ellipsis. Finally, to illustrate, I present a mechanism proposed by ABS (1994) to account for the CCA data which makes use of some of these processes.

Let's begin with the process of Right Node Raising. Ross (1967) and many others (such as Bresnan 1974, Hudson 1976, Larson 1990, Maling 1972, Postal 1974, Williams 1990) assume that an element (that is common in all the conjunct clauses) is raised from all the conjuncts to the right periphery of the coordinated construction through Across-the-Board extraposition. See example (4) from German by Hartmann (2000: 34), the indefinite is assumed to be involved in Right Node Raising in (4a), here the meaning of the expanded structure in (4b) as well as the reduced structure in (4a) is exactly the same. Under Postal's analysis, the structure for (4a) would be as in (5) below.

- (4) (a) um vier Uhr kam und um fünf Uhr ging jemand
 at four o'clock came and at five o'clock left somebody
 'Somebody came at four and somebody left at five.'
- = (b) um vier Uhr kam jemand und um fünf Uhr ging jemand



Even though Hartmann (2000) also uses the term “Right Node Raising”, she argues that Right Node Raising (henceforth RNR) involves phonological reduction of identical material rather than actual dislocation/raising of the material to the right.⁵⁵ Thus rather than syntax, this process belongs to the PF component of grammar. According to this analysis, the construction has a syntactically intact biclausal structure with no Across-the-Board extraposition. In PF, the identical material in the first conjunct is reduced (e.g. through deletion). Thus, under this analysis, (4a) would be represented as (6) below, the strikethrough shows the deleted material.

- (6) [[um vier Uhr kam ~~jemand~~] [und [um fünf Uhr ging jemand]]]

⁵⁵ Such a theory of RNR was first proposed by Wexler & Culicover (1980). Hartmann (2000) mentions that she continues to use the term “Right Node Raising” for convenience sake, it can freely be replaced with a more neutral term “backward ellipsis”. She calls the analysis/theory of RNR that she uses the “PF Reduction theory”, and Postal's analysis the “Movement Theory”.

Hartmann mentions that the string, that is identical in both the conjuncts, can be of any length and does not necessarily have to be a constituent. But she suggests that RNR constructions have a typical accent pattern, the focus in RNR construction always stays narrow on the last element preceding the target. For example “kam” in the first clause above would have the narrow focus, and similarly “ging” in the second clause would have the narrow focus.

As mentioned above, another process that is used to derive fragments is “Gapping” which was first introduced by Ross (1967). Gapping refers to the elision of finite verbs in sentences (Ross 1967, 1970) as shown through the bold strikethrough in coordinate structures in (7) below. The deleted string is referred to as the “GAP” or the gapped string. Gapping can work forwards as in the English example in (7a) or backwards as in the Japanese example in (7b).

(7) (a) Some ate beans and others ~~ate~~ rice.

(b) Murasugi-wa namauni-o ~~moritsuke~~, Munakata-wa mamemochi-o
Murasugi-Top sea urchin-Acc GAP Munakata-Top bean rice cake-Acc
~~moritsuke~~, Morimura-wa aemono-o moritsuketa
GAP Morimura-Top mixed salad-Acc put on dish

‘Murasugi put a sea urchin on a dish, Munakara a bean rice cake, and Morimura a mixed salad.’ (Borrowed from Kawahara & Shinya 2008: 64)

Ross mentions that the direction of gapping depends on the word order of the language, more specifically on the constituent branching in the deep structure. His directionality constraint on gapping says that the elements on the left branches gap forward (thus in head initial languages we should expect forward gapping) and the elements on the right branches gap backwards (thus in the head final languages we should expect backward gapping). This is supported by many researchers. For example, Goodall (1987) mentions that no verb initial language is attested that shows backward gapping, and although there are exceptions such as Basque, most verb final

languages only allow backward gapping and not forward gapping.

There are at least three types of analyses for gapping: the PF deletion (Hartmann 2000, Ross 1967, 1970 among others), the Across-the-Board movement (Johnson 1994, 2009), and the base generation of defective structures (Chao 1988, Gazdar 1981, Sag et al 1985).

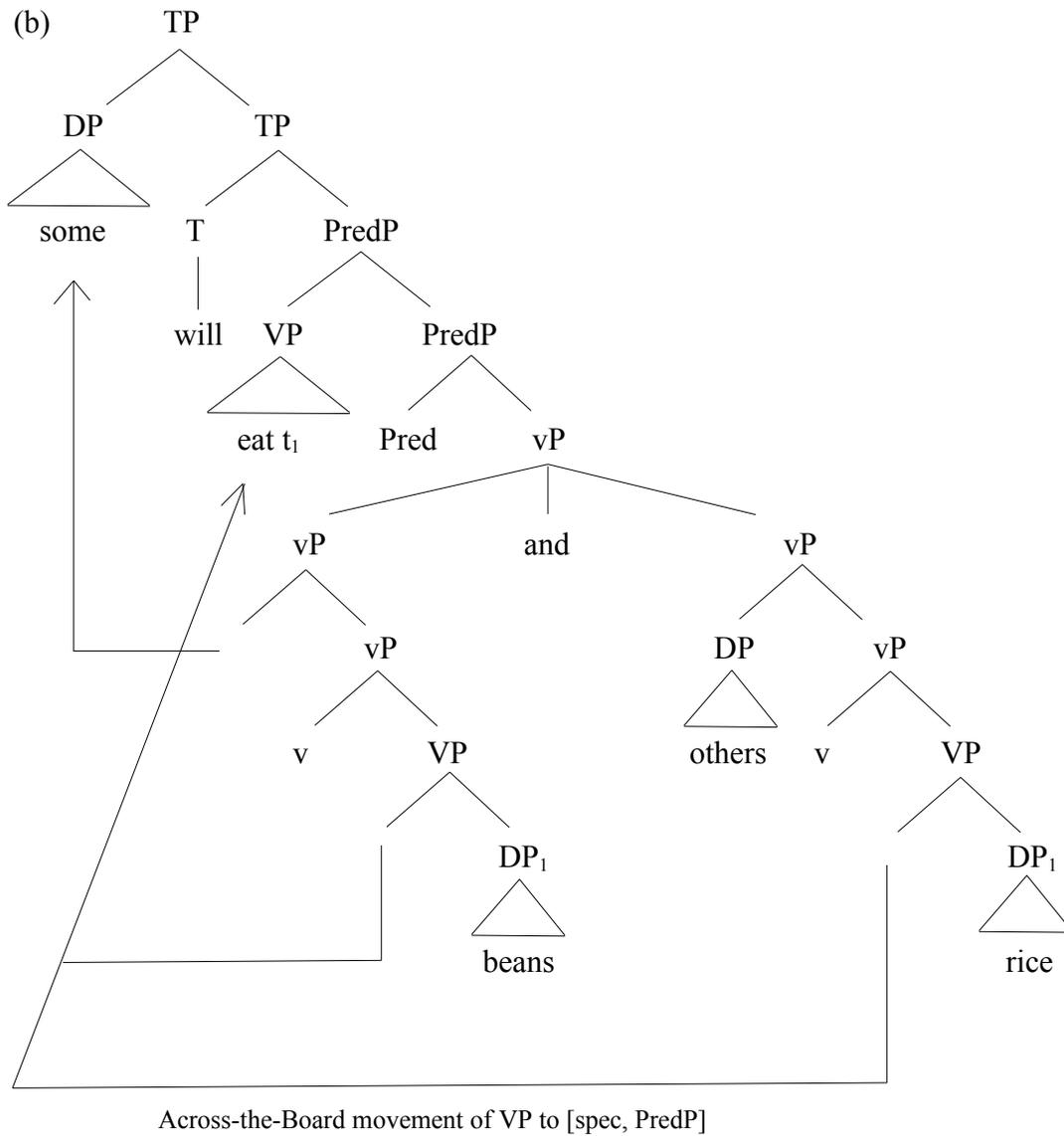
(i) PF deletion approach to gapping: In this approach, the missing verb is assumed to be present in all the conjunct clauses but is deleted at PF, as in (7) above. In verb initial languages, the verbs are deleted from the non leftmost clauses (7a). In verb final languages, the verbs are deleted from the non rightmost clauses (7b). Hartmann (2000) accounts for the deletion in gapping contexts in terms of focus and (de)accenting. She suggests that the remnants in gapping must be contrastively accented. Only the deaccented material can be gapped. She assumes that deaccenting can take place only if the deaccented part is identical in both conjuncts.

(ii) Across-the-Board movement approach to gapping: In the Across-the-Board movement approach, gaps are traces rather than ellided strings. Johnson (2009) assumes that gapping involves coordination of vPs (instead of coordination of clauses). He assumes that each vP conjunct has its subject base-generated in its specifier. The subject from the first conjunct moves out of the coordinated vP, say it moves to the [spec, TP] position.⁵⁶ The objects in each of the conjuncts move out of the VP and adjoin to the VP node. The remnant VPs then Across-the-Board move out of the conjunct vPs, this movement may be fed by operations such as Heavy NP Shift. The position where VPs move to is immediately above the vP, Johnson (2009) calls this position the PredP following Zwart (1997).⁵⁷ This derivation is shown in (8) below, borrowed from Johnson (2009).

⁵⁶ Note here the subject of the first conjunct vP violates Ross' (1967) Coordinate Structure Constraint in its movement out of the conjunct to the higher [spec, TP] position.

⁵⁷ In Zwart's analysis, PredP is a functional projection on top of VP, which is the licensing domain for the predicate.

(8) (a) Some will eat beans and others rice.



The derivation in (8) accounts for forward gapping in head initial language English, however similar derivation can be applied to head final languages such as Japanese, the only difference would be that instead of leftward Across-the-Board movement of the VP, the movement would be to the right.⁵⁸

(iii) Defective base generation approach to gapping: Under this approach, e.g. in Chao (1988),

⁵⁸ However see section 4.2 below where I mention a problem with this account for head final languages.

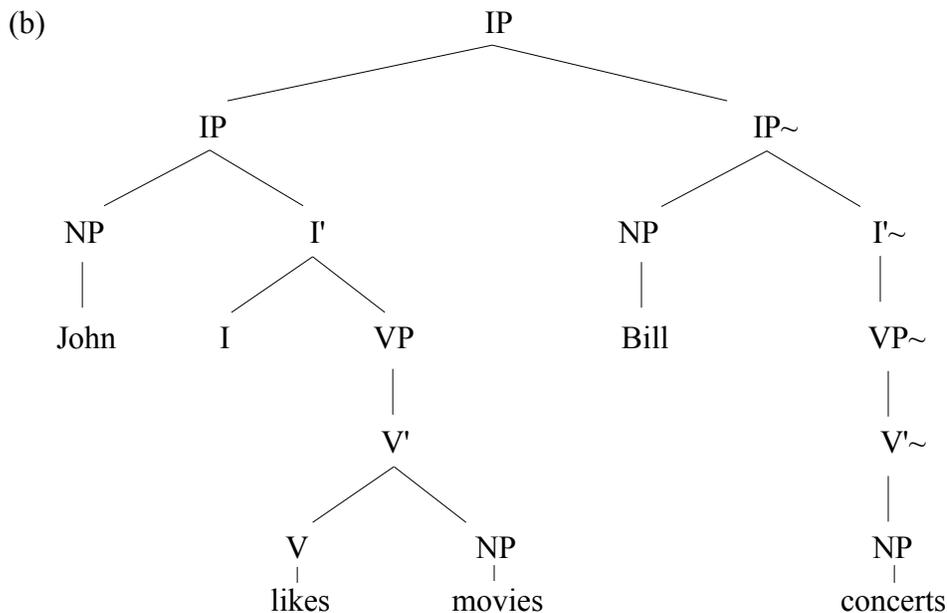
it is assumed that gapping represents a defective X' structure, which allows projections that lack a head. Here the heads are not empty, they are just not base generated, see (9) below for the defective X'-schema (which Chao also calls the H~ series as it lacks a head). According to Chao, this X'/H~ schema is also universally available in UG besides the X'/H+ schema (where the heads are present).

(9) Defective X'- schema: H~ series (Chao 1988)

$X''\sim \implies (\text{SPEC}) (X'\sim) Y^*$
 $X'\sim \implies Y^*$

The defective X'/H~ schema differs from the normal X' schema (i.e. H+ schema) in that the structural head can never be instantiated, and the head projections are themselves optional. All the other constituent expansions are optional just as they are in the normal X' schema as well. Thus, according to Chao (1988), the structure for a sentence involving gapping such as (10a) would be as in (10b) below.

(10) (a) John likes movies and [Bill ___ concerts].



Thus, under this approach, it is assumed that the non leftmost clauses can contain the defective X' structures. This approach is applicable to head final languages, there the assumption would be that the non rightmost clauses can contain the defective X' structures.

However gapping involves elision of the finite verb, further elements may also be missing/ elided. For example, in (11a) below, besides the verb *eat*, the direct object *poi* is also missing. In (11b), besides the verb *caught*, the indirect object *for Mary* is also missing.

(11) (a) Some will eat *poi* for breakfast and others for lunch. (taken from Johnson 2009: 305)

(b) Peter caught an eel for Mary in the Charles River and
John a flounder in the Missisquoui.

(taken from Hartmann 2000: 146)

Under the PF deletion approach (specifically Hartmann's 2000 approach here), this fact can be explained as follows. The elements that are identical in both the conjuncts can be deaccented in the non leftmost clause (in head initial languages, as in English examples above). The deaccented material can be ellided, the rest of the material in the gapped clause shows contrastive accent.

Under the Across-the-Board movement approach, the material within VP that is not gapped is moved out of the VPs (just like the direct object is shown to move out in example (8b) above) before the remnant VP is moved to the [spec, PredP]. Thus, in (11a) above, the PP *for lunch* is moved out of VP and adjoined to it before remnant VP [*eat poi t_{PP}*] is moved to [spec, PredP]. Similarly in (11b), the direct object *a flounder* and the PP *in the Missisquoui* are moved out of VP before the rest of the VP [*caught t_{DO} for Mary t_{PP}*] is moved to [spec, PredP].

Under the defective base generation approach, we would need to assume that the N head for the direct object *poi* is not generated in (11a), thus giving the impression that the NP *poi*

is gapped together with the verb. Similarly the P head for the PP *for Mary* is not base generated in (11b) giving the impression that *for Mary* is also gapped.

VP deletion/ellipsis could be taken as another process involved in deriving fragments. This is illustrated in (12) below, borrowed from Hankamer (1979: 15). He suggests that (12b) is derived from (12a) through the process of VP deletion in the first clause.

- (12) (a) Marvin plays the mandolin and Harry plays the mandolin.
(b) Marvin and Harry play the mandolin.

For VP deletion/ellipsis also, there are various accounts available, e.g. PF deletion account which is similar to Hartmann's account for gapping above (the only difference being that here the whole VP is being deleted), Delta-interpretation account which assumes null anaphoras with all the structure of their antecedants but lacking phonetic material.⁵⁹ Under the PF deletion account, just like in Johnson's (2009) account of RNR above, we may assume that all the overt material (such as the direct object) from the clauses is moved out of VP and is adjoined to it, and then the remnant VP is deleted under identity with the first clause (e.g. in head initial languages).

Now lets look at an example of the mechanism which results in deriving fragments from the clausal conjuncts under the clausal coordination analysis for CCA which makes use of some of the above described reduction processes. ABS (1994) provided an account of CCA in terms of clausal coordination (rejecting the idea that agreement could take place in the government

⁵⁹ Winkler (2005) lists the following accounts that have been proposed for VP ellipsis: PF deletion (Tancredi 1992), syntactic deletion (Sag 1976), delta-interpretation involving reconstruction (Wasow 1972), proform account (Hardt 1993) etc.

configuration⁶⁰ which may result in CCA or FA as opposed to the spec-head agreement which could only result in FA). They suggested that agreement takes place in the spec-head configuration only. The CCA, thus, is a result of only the closest conjunct being in the spec-head relation with the predicate, hence a sentence of the apparent form [V NP and NP ...] according to them corresponds with [V [NP ...] and [NP ...]] instead of [V [NP and NP] ...]. The arguments in favor of the clausal coordination involve number sensitive items (henceforth NSIs) requiring plurality such as adverbs 'both, together', quantifiers 'each', collective verbs 'meet', relatives requiring plural antecedents, reflexives and reciprocals etc. The reasoning for the argument goes as follows: If it were a coordination of NPs, then the coordinated NP should behave as semantically plural even if it shows CCA (agreement only with one of the conjuncts) and thus co-occur with the NSIs. On the other hand, if it were coordination of two clauses, each NP would be an argument within its own clause and agree with the verb within its own clause (under the spec-head configuration), this should result in an ungrammatical sentence as the NSIs would require plurality. It is found that Arabic does not allow CCA in presence of NSIs, this finding made ABS conclude that the CCA could not appear with phrasal but clausal coordination.

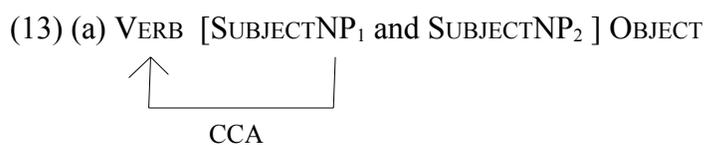
With respect to the mechanisms for deriving fragments from the clausal conjuncts under the clausal coordination analysis, they suggest two possibilities involving gapping, viz. the across-the-board analysis (ATB) and the deployment analysis. In ATB analysis, the spec-head

60 The government approach to agreement was rejected due to some conceptual and empirical problems it had. For example, in double subject constructions, either the agreement should be with the preverbal NP (through spec-head agreement) or with postverbal subject (under government), but we find agreement obligatorily with the preverbal NP in this context, see (iia, iib) below from Lebanese Arabic borrowed from ABS (1994).

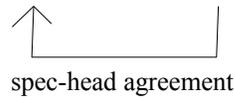
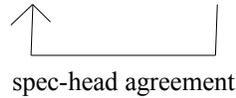
- | | | | | | | | |
|---------|------------------------------------|-------|-------|-----|---------|-----|------------|
| (v) (a) | Kariim | keen | huwwe | w | Marwaan | ʕam | yilʕabo |
| | Kareem | was | he | and | Marwaan | ASP | playing.PI |
| | 'Kareem and Marwaan were playing.' | | | | | | |
| (b) | *Kariim | keeno | huwwe | w | Marwaan | ʕam | yilʕabo |
| | Kareem | were | he | and | Marwaan | ASP | playing.PI |

configuration is reached at S-structure as well as at LF so agreement can take place at any of the two levels, thus the bi-clausal structure is present at both the levels (S-structure and LF). In deployment analysis, we have coordination of NPs only at S-structure which is translated as a conjunction of clauses at LF, thus relevant spec-head relation is reached at LF only and hence agreement can only take place at LF. They find the ATB analysis better than the deployment analysis based on certain facts. For example, the anaphors need to have semantically plural antecedents at S-structure, so this requirement needs to be violated at S-structure to cause the ungrammaticality with anaphors. Similarly, the shared objects take scope over conjunction, the Right Node Raised objects in the ATB structures thus would make sense; in deployment analysis, a stipulation would be needed that deployment follows scope assignment to the object, otherwise each instance of DP object would be free to interact scopally with the subject of its own clause independently. The deployment analysis allows lack of agreement despite the relevant spec-head relation, if the lack of agreement can be rectified at LF, it is not clear why lack of agreement is never possible in Arabic with SV order.

The ATB analysis could be worked out in two ways. The first mechanism involves RNR and other ATB movements. Thus the CCA construction (13a) is assumed to involve clausal coordination (13b), where the surface conjuncts are arguments in separate clauses, and the predicate in each clause in fact agrees with the argument within its own clause through spec-head agreement. The objects are Right Node Raised and adjoined to the IP (13c), and the verb is ATB moved up to the left, as is shown in (13d).



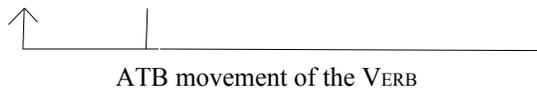
(b) [IP₁ VERB SUBJECTNP₁ OBJECT] and [IP₂ VERB SUBJECTNP₂ OBJECT]



(c) [[IP₁ VERB SUBJECTNP₁ ... e_i] and [IP₂ VERB SUBJECTNP₂ ... e_i]] [OBJECT_i]



(d) VERB_j [[IP₁ t_j SUBJECTNP₁ ... e_i] and [IP₂ t_j SUBJECTNP₂ ... e_i]] [OBJECT_i]



In the above case, since the verb is ATB moved from both the clauses, if the agreement features of the two conjuncts are different, then it is not clear why the ATB-moved verb shows features of the first conjunct. The second mechanism they suggest solves this problem. It involves RNR and something similar to the Delta-interpretation mentioned above for VP ellipsis. To elaborate on their mechanism a little, they assume that the verb moves out of the first clause and there is a silent verb in the second clause which is anaphoric on the first clause verb. The objects are Right Node Raised and adjoined to a higher order conjunction, say FP, as is shown in (13e).

(13) (e) [VERB_j [IP₁ SUBJECT₁ ... t_i]] and [e_j [IP₂ SUBJECT₂ ... t_i ...]] [OBJECT_i]

Here the verb shows agreement features of the closest conjunct since before verb movement out of the first clause, the verb had established spec-head agreement relation with this conjunct as its subject in IP₁.

Thus we see that under the clausal coordination analysis, CCA has been taken as an apparent phenomenon, the predicate in fact agrees with the argument within its own clause, the surface conjuncts being the arguments in separate clauses where the clauses are conjoined. Note

that the agreement with the non-conjoined argument takes place independently in the two clauses (Benmamoun 2000). This larger structure (coordination of clauses) is assumed to be fully available at LF, however at PF (/surface structure) the identical material is deleted (or is of null form and anaphoric) in all the clauses except one, this gives the impression of conjunction of NPs. This analysis is shown to be supported by the fact that NSIs requiring plurality cannot co occur with CCA (for details, see ABS 1994, Aoun & Benmamoun 1999). In the following section, I present arguments against the clausal coordination analysis for CCA.

4.1.2. *Arguments against the clausal coordination analysis of CCA*

Below I show, using mainly Hindi data but sometimes data from other languages too, that the mechanisms involved for clausal coordination analysis to work, viz gapping, ellipsis, and RNR are not adequate in the relevant cases; also the evidence based on which such mechanisms and this analysis is suggested, e.g. the presence of NSIs blocking the CCA, does not necessarily favor the clausal coordination and can very easily be shown to favor the phrasal coordination too the same way; similarly other diagnostics to distinguish between clausal and phrasal coordination do not support the clausal analysis under close examination. Hence I conclude that the clausal analyses cannot be the correct analysis for CCA as they have many theoretical and empirical problems as I describe below which cannot be resolved without unjustified stipulations. The arguments are grouped in six categories: problems related to the reduction processes, inconsistencies regarding the motivating factors for the clausal analyses, problems related to the unreduced form, diagnostics such as constituency tests favoring the phrasal coordination analysis and disfavoring the clausal coordination analyses, theoretical problems, and problems in

explaining empirical facts.

4.1.2.1. Problems related to the reduction processes:

As mentioned above, the reduction processes are involved under the clausal coordination analysis of CCA. The common elements of the coordinated clauses in the sentence are either deleted or across the board (ATB) moved under identity or are null anaphoric to the corresponding elements in one of the coordinated clauses. However, we find a number of problems with these processes as I mention below.

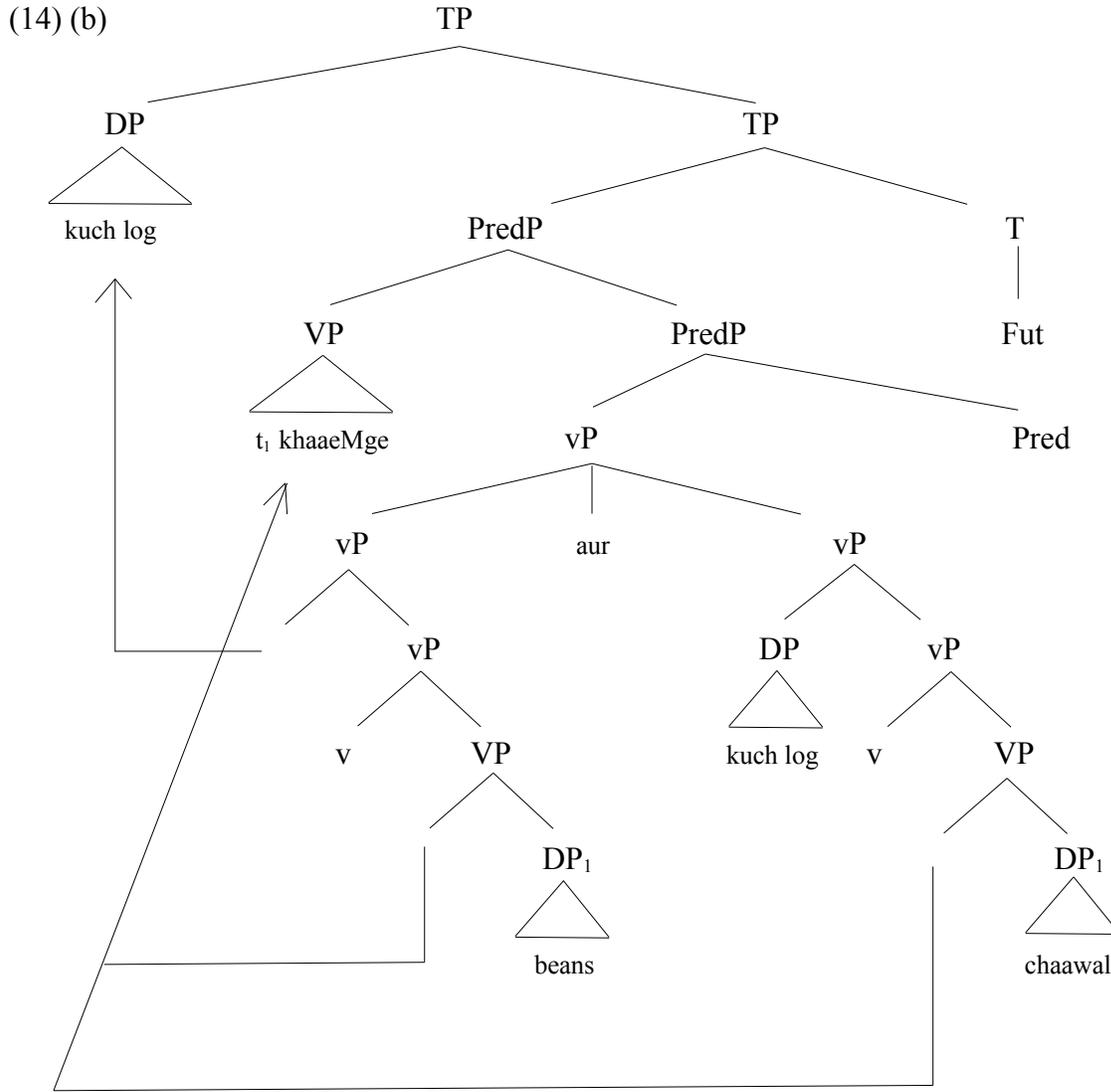
For forward gapping in head initial languages such as English, Johnson (2009) suggests that ATB leftward movement of the VP takes place to the [spec, PredP], as was shown in (8) above. As was mentioned above in section 4.1.1, in a head final language, we should expect backward gapping. This seems to be the case looking at the surface word order in the Hindi sentence in (14a) below. It seems that the verb in the first clause is missing here (if clausal coordination is assumed). Thus for Hindi, we would expect ATB rightward movement of the VP under gapping.

(14) (a) kuch log beans aur kuch log caawal khaa-eMge
 some people beans and some people rice eat-Fut.MPI

The derivation would proceed as follows. The subject from the first vP is moved to the [spec, TP] position just like in his analysis for English. As was mentioned earlier too, this violates the Coordinate Structure Constraint (CSC). Even if we leave this issue aside since the CSC is not a hard constraint and may be allowed to be violated, there is another problem. The VP is ATB moved to the [spec, PredP] position in his analysis.⁶¹ Even though the head Pred is on the right in

⁶¹ As was mentioned in footnote 48 above, following Zwart (1997), Johnson (2009) assumes that the position

Hindi, the specifier position is still on the left. Thus the ATB moved VP should still show up on the left of the coordinated vP as shown in (14b) below.



Across-the-Board movement of VP to [spec, PredP]

But this does not give us the sentence in (14a) unless we stipulate further movement of the verb to the right edge of the clause but this movement does not have any independent motivation.

Similarly stipulating the verb movement to the right prior to the ATB movement of the VP to [spec, PredP] does not have any motivation. Without the above mentioned stipulated movements

where the VPs move to is [spec, PredP] where PredP is the licensing domain for the predicates, also see his statement in (45) on p 308 and the discussion around it.

'... a relationship's protection and carrying out happens.' (Dainik Jagran Corpus)

Even VP ellipsis would be problematic for accounting for CCA for the same reason. Since under VP ellipsis, the VP is elided, it would not elide the tense and aspect auxiliaries from the supposed first clause to result in (15) above because the tense and aspect auxiliaries appear higher in the structure than the VP that is being elided. Johnson (2009: 297) explicitly notes that “VP-ellipsis can elide VPs but not TPs.” This, according to Johnson, prevents the finite auxiliaries from being elided by VP-ellipsis. But since in CCA, under the clausal analysis, we would need to elide/remove the finite auxiliaries as well as seen in (15) above, we would need some other process than VP-ellipsis for reduction.

If we consider it to be TP-ellipsis instead, we would need to move all the elements that are overtly present out of the TP prior to ellipsis, but there is no independent motivation for these movements and also there are no independent positions where these elements move to. Thus we would need to stipulate otherwise unmotivated complex movement operations and target positions for TP (or higher) ellipsis to take place. For example, the absolutive subject in (15a-b) or absolutive object in (15c) would have to move out of the putative conjoined clauses (TPs) before ellipsis. Ellipsis of the first conjoined TP could take place only under identity of structure (Hankamer 1979, Ross 1970). This is shown in (16) for a sentence like (15a).⁶² But we find that there is no evidence or independent motivation for such a movement, at least not for sentences with absolutive subject/ object which are not focussed or topicalized (or in Dayal's 2002 sense, if they are not Ground:Link elements). It is not clear which positions these elements

62 Under the clausal analysis, we cannot consider this coordination in Hindi to be anything less than a coordination of TPs. This is so because, as mentioned above too, it is not just the verb but also the tense, aspect auxiliary that shows agreement in Hindi. Thus if ellipsis takes place, at least TP would need to be elided (to ensure that the T, Asp as well as verb heads are not overly present in the first clause).

(b) laRke-ne [PRO chaataa khariid-naa] eaah-aa-----thaa
 boy-Erg umbrella.MSg buy-Inf.MSg **want-Perf.MSg** Pst.MSg
 aur laRke-ne [PRO chaRii khariid-nii] caah-ii thii
 and boy-Erg stick.FSg buy-Inf.FSg **want-Perf.FSg** Pst.FSg
 'The boy had wanted to buy an umbrella and the boy had wanted to buy a stick.'

Additionally, in Hindi, the direction of CCA also provides an argument against gapping. Note that in Hindi besides the Last conjunct agreement (as in (15), (17) above, and in (18a) below), we also observe the first conjunct agreement (18b).

(18) (a) maiM-ne chaataa aur saaRii khariid-ii
 I-Erg umbrella.MSg and saree.FSg buy-Perf.FSg
 'I bought an umbrella and a saree.'

(b) Raam-ne kyaa khariid-aa ! us-ne khariid-ii **kursii** aur
 Ram-Erg what.MSg buy-Perf.MSg he-Erg buy-Perf.FSg chair.FSg and
 sofaa, jo us-e ham-ne manaa ki-yaa thaa
 sofa.MSg which he-Dat we-Erg forbid do-Perf.MSg Pst.MSg
 'What did Ram buy! He bought a chair and a sofa, which we had forbidden him!'

These facts in Hindi argue against a gapping analysis for CCA because for Last Conjunct Agreement, backward gapping would be required, and for First Conjunct Agreement, forward gapping would be required. However, it has been noted that generally it is the head initial languages that have forward gapping and the head final languages that have backward gapping. However, the presence of both backward gapping as well as forward gapping here may not be taken as an argument against clausal coordination if we assume that the direction of gapping in a language based on its word order is merely a tendency rather than a strong rule. But it should be noted that there is no other evidence that Hindi has both the options (forward gapping as well as

backward gapping). As mentioned above, in Johnson (2009) style gapping, we cannot derive these facts as the VP is ATB moved to the [spec, PredP] which invariably ends up to the left of the coordinated vP and the material contained in it (even though (18b) may be derivable, (18a) is not under this analysis). Even the gapping analysis as proposed in ABS (1994) would be problematic as the verb must undergo across-the-board head movement and the other elements within the VP must undergo right node raising. For such an analysis to be extended to both types of CCA in Hindi mentioned in (18), one would need to posit unmotivated complex movement operations to the left of the verb as well as to the right of the verb to derive the right results.

The CCA constructions such as (18b) cannot even be assumed to result from RNR as RNR involves only the rightmost constituent. Thus even if we assume that CCA constructions such as (15), (17), (18a) involve RNR (either PF reduction style or ATB extraposition style RNR), we would need two separate accounts, RNR for Last Conjunct Agreement as in these constructions, and some other process for the First Conjunct Agreement as in (18b). An account that is able to account for both kinds of CCA (last conjunct agreement as well as first conjunct agreement) would be better than two separate accounts for each of them.

Finally Hartmann (2000) points out various problems with the Postal's (1974) ATB extraposition style RNR as a process of reduction itself. Hence I argue that it cannot be taken as a process involved in the CCA constructions. Below I present a few of the problems that Hartmann mentions for the ATB extraposition style RNR. First of all, she mentions that ATB extraposition style RNR assumes ATB extraposition of constituents only, but even nonconstituents are Right Node Raised. This is shown in the German example in (19) below, borrowed from Hartmann (2000: 57).

- (19) Peter verspricht seiner Mutter ~~in die Kirche zu gehen~~ und Maria
 Peter promises his mother to the church to go and Maria
 (verspricht) ihrer Mutter in die Kirche zu gehen
 (promises) her mother to the church to go
 'Peter promises his mother to go to church, and Maria promises her mother to go to church.'

Notice here that the target of RNR consists of a part of a phrase, namely the DP “Mutter” from the indirect object DP “seiner Mutter”, and an infinitival complement clause “in die Kirche zu gehen”.

The second argument against the extraposition style RNR mentioned by Hartmann is that while extraposition obeys the Right Roof Constraint on Upward Boundedness (proposed by Ross (1967) which says that it cannot leave a CP by successive cyclic movement through [spec, CP]), RNR violates it. See the extraposition examples in (20) and RNR examples in (21) below. (20a) is grammatical where the PP is topicalized, this shows that the PP can move, (20b) is ungrammatical when the same PP is extraposed crossing a CP boundary. If RNR indeed involves movement, then the RNR target in (21) would have moved across several CP boundaries but still the sentence is grammatical. This shows that RNR cannot be assumed to involve extraposition.

- (20) (a) [_{PP} On the history of Chad languages]_i Peter announced [_{CP} that he will write [_{DP} a book t_i]]
 (b) * Peter announced that he will write [_{DP} a book t_i] [_{CP} after giving the talk] [_{PP} on the history of Chad languages] (Hartmann 2000: 62)

- (21) [_{CP} [_{CP} Hans erzählte uns, [_{CP} dass Anna nach Paris ~~gefahren~~ ist]] und
 Hans told us that Anns to Paris traveled is and
 [_{CP} Max erzählte uns [_{CP} dass Ute nach Rom gefahren ist]]]
 Max told us that Ute to Rome traveled is

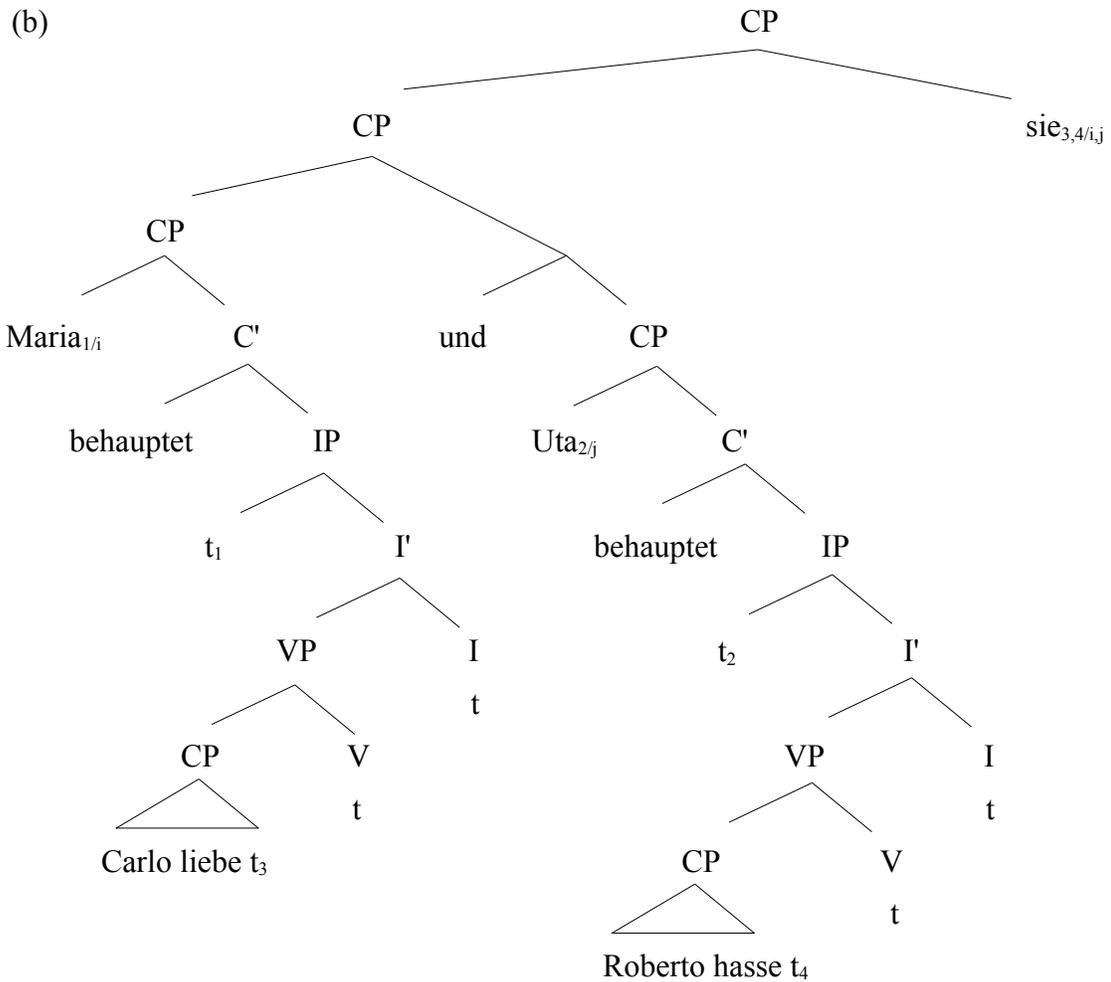
'Hans told us that Anna traveled to Paris and Max told us that Ute traveled to Rome.'

(Hartmann 2000: 63)

Another argument that Hartmann provides to suggest that extraposition style RNR cannot be correct comes from the strong crossover configuration. Under the movement theory of RNR, we would expect the trace of a raised target to be illicitly c-commanded by the coindexed subjects of the conjuncts since the target attaches above the subjects to the root node. Thus the strong crossover configuration should be ungrammatical but notice (22a) is grammatical. This shows that RNR cannot involve movement. Hence the movement style RNR cannot be used as a reduction process.

(22) (a) Maria_i behauptet, Carlo liebe, und Uta_j behauptet, Roberto hasse sie_{i/j}
Maria claims Carlo loves and Uta claims Roberto hates her
Maria claims that Carlo loves her, and Uta claims that Roberto hates her.'

(Hartmann 2000: 76, German)



Thus in this part, I have shown that the processes such as gapping, VP ellipsis and RNR which have been proposed as reduction processes have problems and thus should not be taken to be involved in the CCA constructions.

4.1.2.2. Inconsistencies regarding the motivating factors for the clausal coordination analyses:

In this part I argue that the factors which seem to provide motivation for the clausal coordination analysis should not be taken to imply clausal coordination. I will discuss two factors, namely, (a) the interaction of NSIs and CCA, and (b) distributive reading.

(a) *The interaction of NSIs and CCA*: Gapping (reduction) analysis is based on the observation that CCA does not allow presence of plural NSIs (23). Thus it is assumed that CCA is a result of agreement of a probe with an element within its own clause, thus we have coordination of clauses with conjunction reduction, see (24) below. Since NSIs require a plural licenser, they may not be licensed in individual clauses involving non-plural licensors (ABS 1994). The examples are from Lebanese Arabic borrowed from ABS (1994).

- | | | | | | | |
|----------|------------|----------------|-----|-------------------|-----------------|--------------------|
| (23) (a) | raaħo | kariim | w | marwaan | sawa | (FA with PI NSI) |
| | left.PI | Kareem | and | Marwaan | together | |
| (b) | * raah | kariim | w | marwaan | sawa | (*CCA with PI NSI) |
| | left.3MSg | Kareem | and | Marwaan | together | |
| (c) | raaħ | kariim | w | marwaan | | (CCA, no NSI) |
| | left.3MSg | Kareem | and | Marwaan | | |
| (24) | [raaħ | kariim] | w | [raaħ | marwaan] | |
| | [left.3MSg | Kareem] | and | [left.3MSg | Marwaan] | |
- (Clausal coordination with conjunction reduction)
(verb agrees with the subject in its own clause)

However, it is found that CCA may not necessarily bleed presence of plural predicates/NSIs across languages. It is true that in some languages such as Arabic, presence of NSIs is only possible when there is no CCA. But if we take it to imply that this is because CCA involves clausal coordination due to which NSIs are not licensed (due to lack of a semantically plural licenser in the conjoined clauses), then we have a problem with respect to languages where NSIs are possible even with CCA. For example, Marušič et al (2007) showed for Slovenian that presence of plural NSIs, such as 'collided into' which refer to both parts of the conjunct (which are supposedly in two separate clauses under the clausal analysis) jointly, is possible.

Munn (1999) suggests that the presence of NSIs may not be unacceptable with CCA

due to semantic plurality (as ABS suggested) but the requirement of syntactic (morphological) plurality of the licenser. He shows that even a semantically plural but syntactically singular noun does not allow a NSI, see (25) borrowed from Munn (1999), however see my discussion below where I further modify the requirements imposed by the NSIs.

(25) (a)	el-jama ⁷ a	raaħet		(Lebanese Arabic)
	the-group	left.FSg		
(b)	*el-jama ⁷ a	raaħet	sawa	
	the-group	left	together	
(c)	el-rijal	raaħu	sawa	
	the-men	left.MPl	together	

Below I show that on surface even in Hindi, semantic plurality requirement might seem to work but a clear examination shows that morphological plurality requirement causes unacceptability of NSIs in some cases of CCA as Munn (1999) suggests, otherwise NSIs are possible with CCA too. We find that in Hindi too, plural verb agreement is required in presence of plural NSIs, such as (i) collective predicates like *mil* 'meet', (ii) collective modifiers like *donoN* 'both', *ikaThe* 'together', (iii) collective pronominal modifiers like *ek jaise vichaaron waale* 'of same opinions', (iv) phrases like *aadhaa-aadhaa* 'half and half' which presuppose a plural agent, (v) relatives requiring plural NPs, (vi) reflexives, (vii) reciprocals etc. This is illustrated in (26), notice CCA is not allowed in presence of the collective predicate *mil* 'meet'.

(26) (a)	* raam	aur	siitaa	mil-ii
	Ram.MSg	and	Sita.FSg	meet-Perf.FSg
	'Ram and Sita met.'			
(b)	raam	aur	siitaa	mil-e
	Ram.MSg	and	Sita.FSg	meet-Perf.MPl

The argument for clausal coordination is that the apparent coordinated phrase in context of CCA cannot behave like a semantic plural because there is a clausal coordination with those apparent conjuncts belonging to two separate clauses. However this ungrammaticality might simply be due to the fact that the collective predicate just requires a morphologically plural licenser as Munn suggests (1999), notice even the following sentence (27a) is ungrammatical where we have a semantically plural but morphologically singular licenser for the collective predicate.⁶⁵ (27b) is grammatical because the licenser *parivaar-ke log* is morphologically plural (as is visible through the postposition *ke*, which appears in its plural form).

- (27) (a) * parivaar mil-e
 family.MSg meet-Perf.MPl
 'The family_{Sg} met.'
- (b) parivaar-ke log mil-e
 family-of people.MPl meet-MPl
 'The family members met.'

I further suggest that it is not bare morphological plurality as Munn suggests but morphological matching of features with a semantically plural licenser that these NSIs require. This can be demonstrated through the following data in (27c) where the collective predicate can co-occur with the morphologically Sg semantically Pl licenser when it is in its Sg form, (26a) above was ungrammatical since the NSI's (which had Sg feature) licenser was not a semantically plural NP

65 Note that “parivaar” is not morphologically marked, but it can have agreement features MSg as in (27a) above or MPl as in the following sentence:

- (vi) (a) parivaar mil-e
 family.MPl meet-Pl '(multiple) families met.'

That this is a morphological feature of the licenser can be seen from the difference in the following sentences (note “parivaar” itself is semantically Pl as it refers to a group of individuals), the non collective predicate “aa” ‘come’ gets its features from the subject.

- (vi) (b) [ek parivaar]_{Sg} aa-yaa vs (vi) (c) [kai parivaar]_{Pl} aa-ye
 one family come-Perf.MSg many family come-Perf.MPl
 'a family came.' 'Many families came.'

coordination does not hold with respect to the collective predicate *mil*, however similar facts can be found for the other NSIs in Hindi too.

(b) *Distributive reading*: Since with CCA, we tend to get the distributive reading, it could be argued that this implies a clausal coordination structure in CCA constructions, note Lasersohn (1995) discussed previous analyses which also assumed that the constructions with distributive readings involved LFs with conjoined clauses (however it was not in the context of CCA). But, as Lasersohn also shows, we cannot conclude, based on the distributive reading, that the coordination involves coordination of clauses, since even plural nouns allow distributive reading besides the collective one. See the English example in (28) below from Gleitman (1965). Note the constructions with plural nouns certainly do not involve clausal coordination.

(28) The girls bought the new Steinbeck novel.

This sentence can be interpreted as the girls buying one copy together (the collective reading), or as each girl buying one copy separately (the distributive reading).

Additional support for the argument that distributive reading does not necessarily imply clausal coordination is provided by some languages which make use of a specific conjunction for the distributive reading but do not use it in case of conjoined clauses. For example, in Chinese, there is a specific conjunction “*ji*” which can only occur in distributive coordination of DPs, this conjunction cannot conjoin clauses (see Zhang 2010: 68). Therefore I suggest that the presence of distributive reading does not provide a support for the clausal coordination analysis, rather to explain the distributive reading, an account similar to Lasersohn (1995) may be assumed where the predicate has a D-operator which forces the distributive reading with the coordinated DPs. Based on the above discussion, I suggest that even the

constructions involving CCA should not be interpreted as involving clausal coordination despite the fact that they tend to have distributive readings.

4.1.2.3. *Problems related with the unreduced form of clausal coordination:*

If CCA construction involves clausal coordination with reduction, then its corresponding unreduced form should be equivalent to the reduced form in acceptability judgements and interpretation. Below I present two arguments that suggest that CCA might not involve clausal coordination with reduction.⁶⁷

(a) *The sentence has different meaning from its supposed unreduced form:* If CCA construction involves reduction, then its unreduced form should also have the same meaning as the reduced form. But we find that in certain cases, the meaning changes. For example, (29a) below would have its unreduced form in (29b).

(29) (a)	us-ne	chaataa	aur	kitaab	khariid-ii
	he-Erg	umbrella.MSg	and	book.FSg	buy-Perf.FSg
	'He bought an umbrella and a book.'				

67 Marušič et al (2007) provide another argument against clausal coordination analysis based on the unacceptability of the unreduced form. They show that Slovenian shows CCA even in presence of the collective adverb 'together'. See (29a) below. They argue that if CCA construction is assumed to result from ellipsis, then prior to ellipsis, the construction should look like (viii b) where the NSI 'together' is present in each of the conjoined clauses. However they showed that it is not a well-formed construction in Slovenian. The examples in (viii) are borrowed from Marušič et al (2007: 221), and modified for consistency.

(viii) (a)	Krava	in	njena	teleta	so	se	pasla	skupaj			
	cow.F	and	her	calves.N	are	refl	graze.NPl	together			
	'A cow and her calves were grazing together.'										
(b) *	krava	se	je	pasla	skupaj	in	teleta	so	se	pasla	skupaj
	cow	refl	aux	grazed	together	and	calves	aux	refl	grazed	together

However, this cannot be used as an argument against clausal coordination. It is correct that the ungrammaticality of (b) might be due to the fact that the NSI requires a Pl licenser within its own clause, and the collective adverb 'together' in the first clause does not have a plural licenser. But in the grammatical (a) sentence, the licenser for the collective adverb may have been just the NP "njena teleta" 'her calves' rather than the whole coordinated phrase, i.e. its unreduced form may have been such that the first clause with singular 'cow' as the subject does not have any collective adverb, and the second clause has the plural subject 'her calves' and the collective adverb.

(b) us-ne	chaataa		khariid-aa
he-Erg	umbrella.MSg		buy-Perf.MSg
	aur	us-ne	kitaab khariid-ii
	and	he-Erg	book.FSg buy-Perf.FSg

'He bought an umbrella and he bought a book.'

Here we notice that (29a) has default and in fact the only reading where the same person is the referent for “us-ne” who bought both the things (the umbrella and the book). But in (29b), the default reading is where two different people buy (one person buys the umbrella and the other person the book). Although the one referent reading can be forced in (29b) too, but then the coordination seems like an afterthought rather than coordination with its normal prosody.

(b) The unreduced form seems an incorrect representation of an event: Also assuming a biclausal structure, for the sentence in (30a) below assumes more structure than is required to represent the event. For example, (30a) is interpreted such that it does not have to involve two separate events of buying necessarily, this sentence is perfectly fine if there was just one event of buying in which two objects were bought together. But the structure in (30b) represents two separate events of buying (even if by the same person). Also additionally we need other processes (the reduction processes) to derive the surface structure in (30a) from (30b).

(30) (a) laRke-ne	chaataa	aur	kitaab	khariid-ii
boy-Erg	umbrella.MSg	and	book.FSg	buy-Perf.FSg

'The boy bought an umbrella and a book.'

(b) laRke-ne	chaataa		khariid-aa
boy-Erg	umbrella.MSg		buy-Perf.MSg
aur	laRke-ne	kitaab	khariid-ii
and	boy-Erg	book.FSg	buy-Perf.FSg

'The boy bought the umbrella and the boy bought the book.'

It would still make sense to assume the biclausal structure even if we had to make stipulations for the processes to work if there was any interpretation for the supposedly reduced sentence that we were not able to get assuming the phrasal coordination structure but was present and possible with the clausal coordination structure. But if assuming clausal structure does not avail us of the interpretation that the original sentence has but not possible with the phrasal structure analysis, or if it forces an interpretation that the original (supposedly reduced) sentence does not have, then the phrasal coordination analysis should be considered correct/better than the clausal coordination analysis.

4.1.2.4. Diagnostics such as constituency tests disfavor the clausal coordination analysis and favor the phrasal coordination analysis:

Diagnostics for the clausal vs phrasal coordination for CCA, such as constituency test, do not support the clausal coordination for Hindi CCA facts when looked at carefully. Below I present a constituency test, namely topicalization, to illustrate the point.

Topicalization: The constituency test of movement and topicalization disfavors the clausal analysis and supports the phrasal analysis. Under phrasal coordination, the two NPs make a constituent and thus should be able to be moved and topicalized together. This is exactly what we find irrespective of whether we have full agreement as shown in (31a) or CCA as shown in (31b). Note the coordinated object is moved to the front for topicalization in both the sentences in (31). If we had clausal coordination for CCA, this sort of movement should be problematic for

the reasons discussed in section (4.1.2.1) above.

- (31) (a) chaawal aur daal raam-ne khaa-ye the
 rice.MPl and dal Ram-Erg eat-Perf.MPl Pst.Pl
 'The rice and dal, Ram had eaten.'
- (b) chaawal aur daal raam-ne khaa-yii thii
 rice.MPl and dal Ram-Erg eat-Perf.FSg Pst.FSg

Another diagnostic for the clausal vs phrasal coordination for CCA can be found in the difference between the nominal vs pronominal conjuncts. We find that even though CCA in Hindi can take place between the nouns and verbs (32a), as well as between the pronouns and verbs (33a), it is seen to a much lesser degree for pronouns than for nouns. Agreement as would have resulted from resolution seems to be the favored option with pronouns (33b).

- (32) us pahaaRii se DaMDaa aur skate fisal ga-yii thii
 that cliff from stick.MSg and **skate.FSg** slip go-Perf.FSg Pst.FSg
 'The stick and the skate had slipped from that cliff.'
- (33) (a) us pahaaRii se vo aur ye fisal ga-yii thii
 that cliff from he and **she** slip go-Perf.FSg Pst.FSg
 'He and she had slipped from that cliff.'
- (b) us pahaaRii se vo aur ye fisal ga-ye the
 that cliff from **he** **and** **she** slip go-Perf.MPl Pst.MPl

If clausal coordination with reduction leads to CCA, there should not have been any difference between the verbal agreement with the putative closest conjunct noun and the closest conjunct pronoun, compare (34a) and (34b) below.

- (34) (a) us pahaaRii se DaMDaa fisal ga-yaa thaa aur
 that cliff from stick.MSg slip go-Perf.MSg Pst.MSg and
 us pahaaRii se skate fisal ga-yii thii
 that cliff from **skate.FSg** slip go-Perf.FSg Pst.FSg

(b) us	pahaaRii	se	vo	fisal	ga-yaa	thaa	aur
that cliff	from	he	slip	go-Perf.MSg	Pst.MSg	and	
us	pahaaRii	se	ye	fisal	ga-yii	thii	
that cliff	from	she	slip	go-Perf.FSg	Pst.FSg		

Thus under the clausal coordination analysis of the surface conjoined phrases, it is not clear why the surface coordinated phrase consisting of pronominals could not as readily be involved in the clausal coordination constructions as the one consisting of the nominal elements is. If, however, the conjunction in (32) and (33) is seen to involve phrasal coordination, then it can be explained why the agreement features as a result of resolution show up on the verb in case of pronominal conjuncts more often.⁶⁸

4.1.2.5. *A Theoretical Problem:*

Under the clausal coordination analysis for CCA, we need to resort to the reduction approach. As Hartmann (2000) points out, the reduction approach creates empty elements or assumes base-generated empty elements which do not fit into the well-established typology of syntactic empty categories, hence any reduction approach would have to say something special about licensing and interpretation of the deleted strings as well as of the remnants of deletion.

4.1.2.6. *Problems in explaining empirical facts:*

⁶⁸ Also the following argument favoring the clausal coordination is not very strong. The argument goes as follows: since there seems to be an intuitive (/prosodic) pause after the first conjunct in CCA cases, it might be suggestive of a gap or a trace there, and hence it might suggest that we have a coordination bigger than merely NPs. However, this argument is not in fact a strong argument as the pause might also indicate the structure of coordination instead. As mentioned above (in chapter 3), Johannessen assumes that the conjunction takes the second conjunct as its complement and thus forms a closer unit with it than with the conjunct in its specifier. Similarly Munn assumes a BP adjunction structure of coordination where the conjunction and the second conjunct together make a constituent BP which is adjoined to the first conjunct. The pause might indicate the shift from one constituent (first conjunct) to the next constituent (BP).

The clausal coordination analysis fails at explaining certain observations with respect to the CCA which phrasal coordination analysis can explain. Here I will discuss three such observations from three different languages: (a) Mixed agreement, (b) the requirement of strict adjacency between the probe and the goal in CCA context, and (c) the differences based on the position of the arguments.

(a) *Mixed agreement*: Lorimor (2007) observed mixed agreement facts in her experimental study of agreement and coordination with Lebanese Arabic. She used a sentence completion task in which the speakers were prompted to use both a verb and an adjective with a coordinated subject appearing between the two agreeing heads. She found that the speakers produced sentences as in (35a), where the auxiliary verb agrees with closest conjunct to its right while the adjective agrees with the whole coordinated phrase to its left. Thus we see that two elements (auxiliary verb and the adjective) which both acquire predicative agreement may show agreement in such a way that one probe (auxiliary verb) agrees with a single conjunct whereas the other probe (adjective) shows resolved agreement. The agreement for the auxiliary verb is shown through bold and the agreement for the adjective is shown through the arrow below.

(35) (a) kanit	elbatta	wel	wazzi	xuder
was.FSg	the.duck.FSg	and	the.swan.FSg	green.Pl
Aux	Conj1	&	Conj2	Adj

'Was the duck and the swan green?'

(example borrowed from Lorimor 2007: 185)

If a clausal coordination analysis is assumed here, then the fact that the adjective shows full agreement is not explainable since both the coordinated clauses would only have one conjunct

NP each as in (35b), there is no coordinated phrase in the sentence for the adjective to probe and show resolved agreement with.⁶⁹

(35) (b) [Aux Conj1 Adj] & [Aux Conj2 Adj]

Lorimor mentions that other languages also have shown evidence of mixed agreement, for example, McCloskey (1986) provides examples of mixed agreement from Irish (36a), Sadler (2003) shows that Welsh also shows mixed agreement (36b).

(36) (a) Ta' mise agus mo dheartha'ir 'na'r ndochtu'ir'1
 am I Contr and my brother 1Pl doctors
 'My brother and I are doctors.'

(b) Dw I a Gwenllian heb gael ein talu
 am.1Sg 1Sg and Gwenllian without get 1Pl pay
 'Gwenllian and I have not been paid.'

(b) The requirement of strict adjacency between the probe and the goal in CCA context- A motivation for the phrasal coordination analysis based on generalizability: Besides all the above arguments against the clausal coordination analysis, I would like to point out that even if for Hindi one could make one or more of the above-mentioned processes (as in section 4.1.1) to work, another motivation to abandon the clausal coordination analysis and apply a phrasal coordination analysis to CCA is to have an analysis that is generalizable to other (head final) languages as well. The clausal coordination analysis is not able to explain the CCA facts in another head final language Tsez, this is based on the work with Maria Polinsky, the Tsez data considered here are borrowed from BBP (2009). In Tsez, we find that CCA can only take place if the verb is strictly adjacent to the conjunct. For example, if anything intervenes between the verb

⁶⁹ In addition to the problem of how the adjective gets the resolved agreement, under the clausal account, one would have to posit RNR for the adjective here. But in Arabic, RNR does not have any independent motivation and is not generally attested in the language (refer fn 14 in BBP 2009).

and the leftmost member of the coordinated phrase that follows, CCA is not possible. This is shown in example (37) below, borrowed from BBP (2009).

(37) (a) **y-ik'i-s** **kid-no** uži-n
 II-went girl.ABS.**II-and** boy.ABS.I-and
 'A girl and a boy went.'

(b) ***y-ik'i-s** iduyor **kid-no** uži-n
 II-went home girl.ABS.**II-and** boy.ABS.I-and
 'A girl and a boy went home.'

If we try to apply the clausal coordination analysis to Tsez CCA, it is not clear why it should be the case that the verb can only show CCA when it is strictly adjacent to the apparent conjoined phrase (i.e. the verb, which is the goal, only shows agreement with the closest conjunct, which is the probe, when it is strictly adjacent to it) when normally in clauses there is no such restriction that the probe has to be strictly adjacent to the goal argument. Look at the agreement in non conjoined cases in (38) below. The verb (the goal) agrees with the absolutive argument (the probe) in both (38a) and (38b), note while in (38a) the goal is adjacent to the probe, in (38b) it is not.

(38) (a) už-ā **kid** y-egirsi (BBP 2009)
 boy-Erg girl.Abs.**II** **II-sent**
 'The boy sent the girl.'

(b) už-ā **kid** iduyor y-egirsi
 boy-Erg girl.Abs.**II** home **II-sent**
 'The boy sent the girl home.' (personal communication with Maria Polinsky)

This fact is explainable under the phrasal coordination analysis that is proposed in section 4.3

below, which makes use of the PF component in addition to syntax. Thus I argue that since the clausal coordination analysis is not generalizable to other (head final) languages, and the phrasal coordination analysis is, we should choose the phrasal coordination analysis over the clausal coordination analysis for CCA.⁷⁰

(c) *Differences based on the position of the arguments:* There is another problem with respect to the clausal coordination analysis within Hindi. We find that CCA is possible with the objects but not with the unergative subjects (refer to section 4.3.2 below for an account for this variability in availability of CCA with respect to the objects and unergative subjects). As Bhatt & Walkow (2010) mention, if RNR (clausal coordination in general) were the correct analysis for CCA, then since RNR is an option for both the subject (39) and the object argument (40) the same way, CCA should be possible with both the coordinated subjects as well as the objects. But since CCA with coordinated (unergative) subjects is not possible, we would need to block RNR in case of coordinated subjects, but it is not clear how this could be done without making any stipulations.

(39) [raam aaj] aur [ramesh kal] jaa-egaa
 Ram today and Ramesh tomorrow go-Fut.MSg
 Subj Adv & Subj Adv V
 'Ram will go today and Ramesh tomorrow.'

(40) riinaa-ne [kal ek batuaa] aur [aaj ek saarii] khariid-ii
 Rina-Erg yesterday a purse and today a saree buy-Perf.FSg
 Subj Adv Obj & Adv Obj V
 'Rina bought a purse yesterday and a saree today.'

(borrowed from Bhatt & Walkow 2010, modified for consistency)

This fact is also explainable under the phrasal coordination analysis proposed in section 4.3

⁷⁰ I will show in section 4.3 below that the phrasal coordination analysis is generalizable to both the head final languages Hindi and Tsez, and in fact also to head initial languages.

below.

Thus, from the discussion in section 4.1 so far, I conclude that the phrasal coordination analysis for CCA seems a better option than the clausal coordination analysis. In the following section, I discuss the previous phrasal coordination analyses for CCA and their problems and propose an alternative analysis which seems to work better (at least for CCA in head final Hindi, also it is able to explain the FA and CCA facts in head final Tsez and head initial Arabic).

4.2. Phrasal Coordination

As has been mentioned above, the head final language Hindi allows agreement with the rightmost conjunct when the verb follows the conjoined phrase (LCA). This contrasts with head initial languages, such as Arabic, where closest conjunct agreement is with the leftmost conjunct in clauses with VS order (FCA). Munn (2000) argues that the FCA data provides support for the phrasal analysis of coordination. I also argued in the previous section that CCA facts disfavor the clausal coordination analysis (besides other problems with the clausal coordination analysis), and that the phrasal coordination analysis seems better than the clausal analysis for CCA. Thus in this section, I focus on the previous phrasal coordination analyses.

Among the phrasal coordination analyses for CCA (and FA) under the generative paradigm (mainly Principles and Parameters framework, and Minimalism) as well as the optimality theoretic accounts mentioned below, most of the proposals, e.g., Bošković (2009), Johannessen (1996, 1998), Munn (1993, 1999) etc, suggest that CCA results from the asymmetry of the coordination. Thus the agreeing head (say verb) has asymmetric access to one of the

conjuncts (the structurally higher or more prominent conjunct) or its features. For example, Munn (1999), originally Benmamoun (1992), suggests that this asymmetric access to only one of the conjuncts (higher/ prominent one) for CCA is achieved through the structural configuration of (head) government. As opposed to this, the FA can be viewed as resulting from the spec-head agreement configuration. Below I describe the details of these proposals regarding the structure of coordination being responsible for CCA, and I suggest that these analyses make certain incorrect predictions with respect to head final Hindi, and sometimes even other languages (such as Tsez, Lebanese Arabic, Moroccan Arabic etc).⁷¹

4.2.1. Previous phrasal coordination analyses for CCA (and FA) and arguments against them:

Here I present the previous analyses of CCA (and FA), together with arguments against these analyses based on theoretical reasons or empirical facts mainly from head final Hindi, and also from head final Tsez, and head initial Arabic.⁷²

Johannessen (1996, 1998)

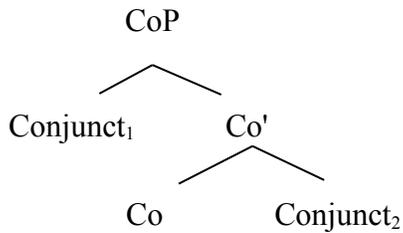
As mentioned in chapter 3 above, Johannessen (1996, 1998) assumes an asymmetric coordinate structure similar to other asymmetric phrases under the X' schema, hence she treats the conjunction as the head and one of the conjuncts in the specifier and the other in the complement position. For head initial languages, she suggests the first conjunct is in the specifier position (left-hand specifier) and for head final languages, the second conjunct is in the specifier position

71 However some parts of some of these analyses are either similar to the analysis proposed in section 4.3 below or I have borrowed some parts of their analyses which seemed useful for the analysis proposed in section 4.3.

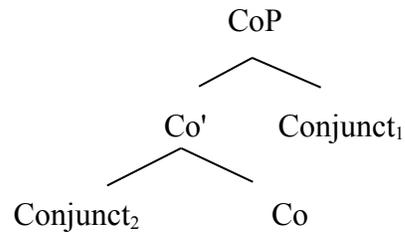
72 The analyses are presented here in a rough chronological order in which they appeared.

(right-hand specifier), as shown in (41) below.

(41) (a) Head initial languages



(b) Head final languages



According to her, the CCA as well as FA is a result of agreement with the CoP. The CCA, for her, is an instance of unbalanced coordination, and FA happens in balanced coordination.

CCA: In CCA, it only appears that the agreement is with the closest conjunct since the features of the highest conjunct in the specifier (Conjunct_1) are transferred to the head (Co) through the Spec-head configuration and then further percolate up to the maximal level, CoP. Thus none of the conjuncts in fact take part in the agreement relationship in CCA, the verb agrees with the whole maximal projection CoP. Since the maximal projection has the syntactic features of the highest conjunct, say the first conjunct in head initial languages, the verb shows first conjunct agreement. The conjunct in the complement position does not offer its syntactic features to the CoP being in the complement position and thus not taking part in the spec-head agreement relation.

FA: FA is also achieved through agreement with CoP but here the features of both the conjuncts are resolved and inherited to the CoP. Johannessen ascribes the resolution of features to the semantic factors.

The head final Hindi displays CCA with the last (rightmost) conjunct, as is illustrated in (42)

below.⁷³ According to Johannessen, the coordination in head final languages has the structure as in (41b) above, with the rightmost conjunct being the most prominent structurally and thus its features are accessible to the verb. The features of the highest conjunct (the conjunct in the specifier position) can percolate up to the CoP and thus V/T can show agreement features of the highest conjunct (the last conjunct), therefore CCA with the last conjunct.

(42) maiM-ne ek chaataa aur ek **saaRii** khariid-ii
 I-Erg an umbrella.MSg and a saaree.FSg buy-Perf.FSg
 'I bought an umbrella and a saree.' (Kachru 1980: 147)

However Johannessen's account seems to explain the Last Conjunct Agreement facts as in (42), there are certain theoretical and empirical problems with it. First of all, she herself mentions certain problems with this analysis but does not offer a solution for them. She mentions that in FA when the resolution of features takes place and the verb shows the resolved features, it is not clear whether these features are part of the syntactic representation or semantic representation. She mentions that if these are part of the syntactic representation, then it is not clear how these features are inherited to the CoP. She also mentions that this is also problematic since the number resolution does not always lead to a plural CoP. This is illustrated in (43) below borrowed from Johannessen (1998: 61). Here it is not clear how one can get non plural features, as in (43a), on the CoP in the case of number resolution.

(43) (a) [A good friend and an eager supporter] has died today.
 (b) [A good friend and an eager supporter] have died today.

She mentions that if the features are considered to be semantic instead, then also it is not clear why agreement with other categories is not always limited to semantic considerations.

73 Also refer to BBP (2009) which shows the same pattern for head final Tsez as well.

Besides these problems, we also see that it is not clear how her analysis would be able to explain the empirical fact that in say Moroccan Arabic, CCA is possible only in the VS order but not in the SV order, as illustrated in (44) below. Notice in both cases below, even though the CoP is at different positions in the sentence with respect to the verb, its internal structure would be as in (41a), i.e. the first conjunct is higher in the specifier position and thus its features should be on CoP and thus accessible to the verb in both the word orders in (44).

(44) (a) **VS order, CCA possible:**

Mša	ʕumar	w	ʕali	(ABS 1994: 207)
left.3M	Omar	and	Ali	
'Omar and Ali left.'				

(b) **SV order, CCA not possible:**

* ʕumar	w	ʕali	mša	(ABS 1994: 208)
Omar	and	Ali	left.3M	

Similarly in the head final Hindi, we find not just Last Conjunct Agreement as in (44) above, but also First Conjunct Agreement as in (45) below, taken from BBP (2009), modified for consistency.⁷⁴

(45) Raam-ne	kyaa	khariid-aa!	us-ne	khariid-ii	kursii		
Ram-Erg	what.MSg	buy-Perf.MSg	he-Erg	buy-Perf.FSg	chair.FSg		
aur	sofa,	jo	us-e	ham-ne	manaa	ki-yaa	thaa
and	sofa.MSg	which	he-Dat	we-Erg	forbid	do-Perf.MSg	be.Pst.MSg
'What did Ram buy?! He bought the chair and sofa, which we had forbidden him (to buy)!'							

However, if Johannessen's account is correct, then we should only expect Last Conjunct

⁷⁴ Refer to BBP (2009) which shows the same pattern for head final Tsez as well.

Agreement in Hindi since it is head final and thus should have the coordinate structure as in (41b) above. Johannessen's account predicts that within the same language, we should not observe the CCA with the first conjunct as well as the last conjunct. Besides, her assumption about head final languages having the structure as in (41b) may not work for all languages. Notice I showed in chapter 3 above, the head final Hindi in fact has a head initial structure of coordination as in (41a) only.⁷⁵

An additional argument against this account comes from the mixed agreement data as mentioned in section 4.1.2.6 above. To remind the reader, in Lebanese Arabic for example, mixed agreement is attested when a coordinated phrase appears between two agreeing heads (an auxiliary and an adjective), the preceding auxiliary can show CCA while the following adjective shows FA.

Johannessen's account would not be able to explain these mixed agreement facts. For her, FA as well as CCA is the result of agreeing with the CoP and showing its features. Thus if a goal, such as the auxiliary verb shows CCA with the first conjunct, then it must mean that the CoP has the features of the first conjunct, but since the predicative adjective shows FA, it must mean that the CoP has resolved features. Thus we see that mixed agreement facts are problematic for Johannessen as the agreement on the goal preceding the conjoined phrase and the goal following the conjoined phrase suggest contradictory features on the CoP.

Also as Lorimor (2007) mentions, Munn (1999), proposing his analysis (which is also discussed below), suggests another problem with Johannessen's account. For Munn, government relation is involved in the CCA cases. He argues that Johannessen's specifier-

⁷⁵ The same is true for head final Tsez as well, Tsez also has a head initial structure of coordination, refer to BBP (2009).

complement structure of coordination would be problematic due to the general unavailability of recursivity in defining government.

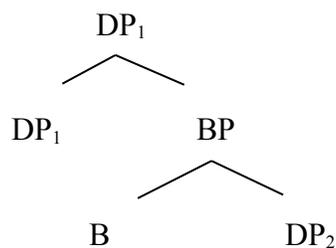
Finally, Johannessen's account involving percolation of features of the higher conjunct to the maximal projection is problematic as percolation of categorial features would also be assumed but categorial features never percolate up.

Thus we see that Johannessen's account cannot account for head final Hindi, and also head initial Moroccan Arabic and Lebanese Arabic data mentioned above, in addition to the theoretical problems it faces.

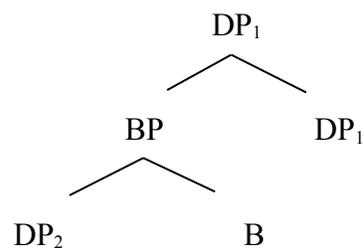
Munn (1993, 1999, 2000)

As was mentioned in chapter 3 above, Munn (1999, 2000) assumes an adjunction structure of coordination where he takes one of the conjuncts as the head of the conjoined noun phrase (first conjunct in head initial languages and last conjunct in head final languages), and the other conjunct makes a Boolean Phrase with the head B (conjunction), and this phrase is then adjoined to the conjunct that is the head of the conjoined phrase, see (46) below. This, according to Munn, makes the first conjunct (DP₁) an accessible agreement controller but not the second conjunct (DP₂).

(46) (a) **Head Initial languages**



(b) **Head final languages**



In his account, the presence of two agreement patterns CCA and FA is a result of the availability of two different configurations for agreement: government configuration and the spec-head configuration. According to Munn, FA is a result of normal conjunct resolution rules. However when the agreement is achieved through government which can only “see” the governed element (in Munn's words), the conjunct resolution rules can be overridden, resulting in agreement with the conjunct visible to government (CCA). In case of spec-head agreement configuration, more than one conjunct is visible, resulting in FA. This is to be noted that the semantic agreement would be the result of the conjunct resolution rules which is available in both agreement configurations (government as well as spec-head agreement), that is why FA is available in both VS and SV word orders in, for example, Arabic. It is the syntactic agreement which may differ, as mentioned above, governed agreement may lead to CCA while spec-head agreement can only lead to FA. Since Minimalism dispenses with government as a crucial notion, Munn (2000) emphasizes that its effects should be accounted for in other ways. Thus he suggests that in the Minimalist framework, the difference might be due to Attract F or Agree (without movement) for the earlier government configurations; or Move or Agree+Move for the earlier spec-head configurations.

As I mentioned above, Johannessen's account was unable to explain the Moroccan Arabic data that CCA was not possible in the SV order, but only in the VS order. Munn's account presented here is able to explain this data in terms of the agreement configurations. Since in the VS order, the agreement configuration is government (or Attract F or Agree (without movement)), conjunct resolution rules can be overridden by the agreement with the governed element, thus CCA is possible. But in the SV order, the agreement configuration is spec-head

configuration, thus there we get FA only. Similarly Munn's account would be able to explain the mixed agreement data mentioned above that Johannessen's account could not explain. Again since the sentence initial auxiliary verb is in government configuration (or Attract F or Agree (without movement)) with the coordinated phrase, it shows CCA. But the predicative adjective that follows the coordinated phrase establishes the spec-head configuration with it in the clausal structure, thus it shows FA.

However Munn's account also still faces some of the same problems that Johannessen's account faced. As mentioned above too, in head final Hindi (illustrated below), unlike Arabic, the rightmost conjunct enters into the CCA relation. See (47) below where the verb *khariidii* displays the number and gender features of the rightmost (closest) conjunct *ek saaRii*.

(47) maiM-ne ek chaataa aur ***ek saaRii*** khariid-ii
 I-Erg an umbrella.MSg and ***a saree.FSg*** buy-Perf.***FSg***
 'I bought an umbrella and a saree.'

(Kachru 1980, glosses and transcription modified for consistency)

According to Munn's analysis, the CCA (Last Conjunct Agreement) facts in Hindi would suggest that the entire coordinated phrase is a projection of the rightmost/last conjunct, i.e. the last conjunct is structurally more prominent being the head of the conjoined noun phrase to which the other conjunct is adjoined. Thus the structure of coordination would be as in (46b) above. However, as I argued in chapter 3, binding, movement, prosody etc show that it is the first conjunct that is more prominent even in Hindi, the structure of coordination is head initial as in (46a) only.

Additionally even if we ignored the above problem, and assumed that Munn's

analysis were on the right track, the prediction for head final languages would be to see Last Conjunct Agreement, not First Conjunct Agreement. But as was mentioned above, Hindi shows both Last Conjunct Agreement (as in (47) above) as well as First Conjunct Agreement (as in (45) above). These data are problematic for Munn's analysis just like they were for Johannessen's analysis above. The Last Conjunct agreement, as in (47) above, would suggest the coordinate structure as in (46b) for Hindi, while the First Conjunct Agreement, as in (45) above, would suggest the coordinate structure as in (46a) above. But it is unlikely that within the same language, the structure of coordination would be different depending on whether the verb shows agreement with the first conjunct or the last conjunct. Again, here also as I argued above, evidence in these languages disfavors the coordinate structure in (46b).

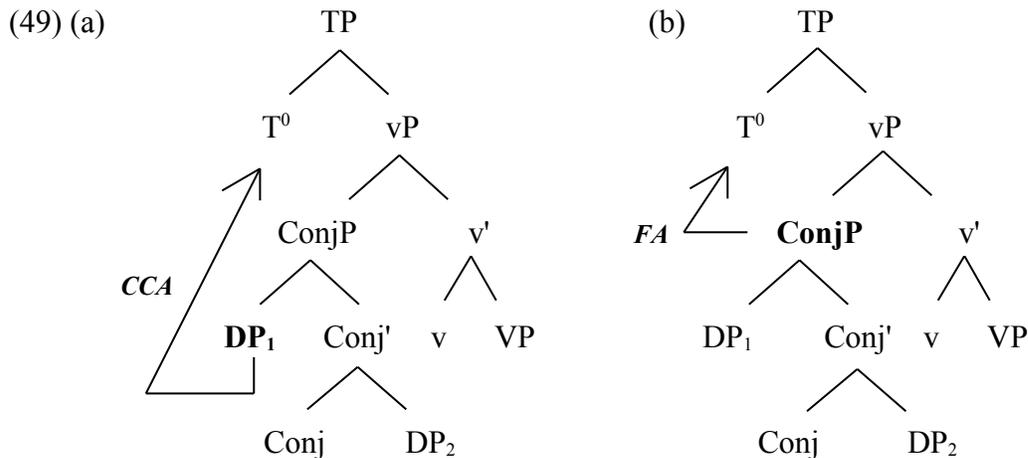
Also Johannessen (1998) points out the following problem with Munn's analysis. She mentions that in Munn's account the top node of the coordinated phrase is identical to the first conjunct. But since coordinated singular NPs/DPs usually have a plural interpretation (48), the coordinated phrase is required to receive plural features. It is a problem to assume that the top category inherited from the first conjunct should select and change features depending on some category that is adjoined to it, but Munn's account needs it.

(48) [A man_[Sg] and a woman_[Sg]]_[Pl] were_[Pl] / *was_[Sg] arrested
 (Johannessen 1998: 165)

Thus we see that Munn's analysis also faces problems in explaining the CCA and FA facts (in head final Hindi, and other languages).

Babyonyshev (1996)

Babyonyshev (1996) assumes the spec- head structure of coordination, similar to Johannessen's structure in (41a) above. The CCA and FA patterns, according to her, result from the covert movement of the ϕ - features of the closest conjunct (structurally) or of the whole coordinated phrase ConjP respectively. She, analyzing the Russian agreement data, suggests that in the VS order, both agreement patterns are possible since T is equidistant from the ConjP as well as the DP₁ and thus it can agree with either one of those. If the features of DP₁ move to T head, we get CCA as in (49a), and if the features of the ConjP move which gets the resolved agreement features of the conjuncts, we see FA, as in (49b). The features of the second conjunct DP₂ do not move, according to her, despite being in the same phase as the first conjunct DP₁ (and thus being equidistant from T) because DP₁ is more prominent as it can c-command DP₂.



Babyonyshev suggests that the availability of only FA in the SV order is a result of the fact that the overt movement of the DP₁ to [spec,TP] instead of the covert movement of the features of DP₁ would violate the Coordinate Structure Constraint, and thus CCA is not possible with overt movement of DP₁. If the ConjP moves overtly, on the other hand, T establishes the agreement

relationship with the whole ConjP resulting in FA.

Thus we see, Babyonyshev proposes that the two patterns of agreement are based on whether T head establishes Agree with the first conjunct or ConjP since both are equidistant from the T head. Hence, for Babyonyshev it is optional for the T head to Agree with either DP₁ or ConjP. However, Citko (2004) proposing her analysis mentioned below, argues against Babyonyshev's analysis and in favor of removing the optionality from the grammar. In Babyonyshev's analysis, it is not clear why we have this optionality between DP₁'s or ConjP's features moving up. It does not seem to have any other motivation except for the fact that we see two different agreement patterns. Babyonyshev mentions that since DP₁ and ConjP are equidistant from T, either one's features can move up. However, it should be noted that the definition of “equidistance” is not undebatable. For example, Fitzpatrick (2002) shows how various accounts of locality and distance differ empirically from each other. He notes that Kitahara (1997), Müller (1996) and Sauerland (1999) present evidence that suggests that a category, say H, that dominates another category, say G, is closer to an attracting head than G is (A-over-A effect). Thus following them, Babyonyshev's account would fail since the features of the two elements, viz. DP₁ and ConjP are not really equidistant.

Additionally Citko (2004) mentions another problem with Babyonyshev's analysis. Babyonyshev's analysis relies on the assumption that the feature movement, more generally the covert movement, is not subject to the Coordinate Structure Constraint. Citko shows that this assumption is empirically problematic. For example, the ungrammaticality in (50) below shows that covert wh-movement is subject to the Coordinate Structure Constraint.

(50) * I wonder who [took what from Mary] and [gave a book to Jeremy]. (Citko 2004)

Furthermore, Babyonyshev's analysis also cannot explain the Last Conjunct Agreement data in head final Hindi (42) since she would need to assume that the last conjunct is more prominent than the first for T to access its features, but that is not true for Hindi. Similarly CCA in both directions within the same language is problematic as that would require the coordinated phrase to have first conjunct c-command the last conjunct in First Conjunct Agreement constructions (head initial structure of coordinated phrase) and the last conjunct to c-command the first conjunct in Last Conjunct Agreement constructions (head final structure of coordinated phrase), but the structure of coordinated phrase in Hindi is consistently head initial, further this stipulation is not supported by any other phrase in Hindi, i.e. no other phrase is found that has a head initial structure in certain constructions and head final in others. Additionally if we apply her analysis to head final languages, and if we ignore the problem with the structure of coordination mentioned above, we may predict to find both CCA and FA in the SV order in head final languages. But in the VS order, since the coordinated phrase moves to the right of the verb (V+T), we should only expect to see FA, but as the Hindi data show, First Conjunct Agreement is possible in this word order, see (45) above. Thus the prediction that Babyonyshev's analysis makes with respect to head final languages is not borne out in head final Hindi.

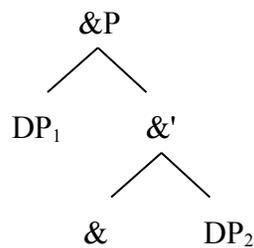
Also this is not clear how Babyonyshev's analysis could account for the mixed agreement facts, in say Lebanese Arabic mentioned above. Since the verb preceding the coordinated phrase shows CCA, that can be explained. The features of the first conjunct and that of the coordinated phrase are equidistant, if the features of the first conjunct move to the T head, we get CCA. But the predicative adjective that follows the coordinated phrase shows FA only. Since in this case the coordinated phrase has not moved from its base generated position, there is

no reason to assume that only FA should be possible here. Thus for this case, Babyonyshev's account is not sufficient, we would need another mechanism which derives the FA possibility only with the predicative adjectives.

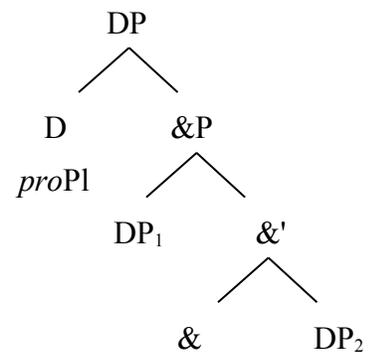
Citko (2004)

Citko (2004) assumes two separate structures of the coordinated phrases for the two agreement patterns as illustrated in (51). The bare &P structure, a spec-head structure of coordination (see (51a) similar to Johannessen's (41a) above), is assumed for the CCA pattern. The Plural Pronoun &P structure, which involves a null plural pronominal element which takes the &P as its complement (as in (51b)), is assumed for FA.

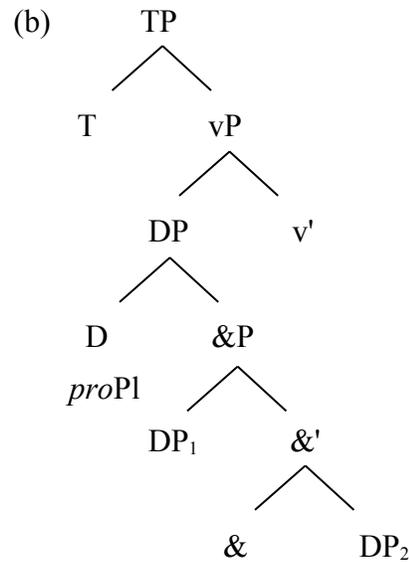
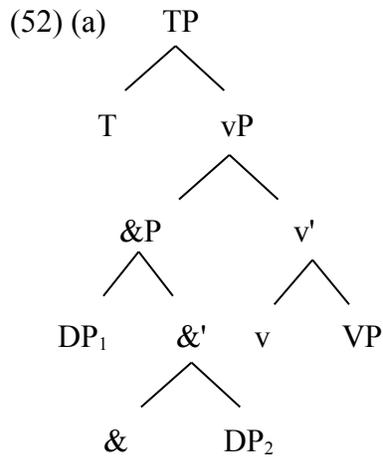
(51) (a)



(b)



The T head simply agrees with the ϕ - features of the closest nominal for both CCA and FA, see (52) below. Agreement of the T head with the ϕ - features of closest nominal element in (52a) results in CCA as the closest nominal element is the first conjunct DP₁. In (52b) also, the T head agrees with the closest nominal element, but this results in FA as the closest nominal element is the null plural pronoun in D rather than DP₁. This explains why both CCA and FA are possible in the VS order.



Thus we see that while for Munn and also for Johannessen, accounting for FA was problematic and they simply took FA to be some semantic phenomenon, Citko derives it through clear syntactic means.⁷⁶ She posits a null pronominal that takes the coordination phrase as its complement. While for Munn, the resolved feature is the default which could be overridden in appropriate configuration, viz. government (Agree without Move) for CCA, Citko suggests that the null pronoun with the resolved features is present sometimes which leads to FA and absent at other times which leads to CCA. Thus while Munn considers different configurations for agreement, Citko considers different structures of the coordination phrase to determine if CCA or FA takes place.

Citko's analysis can explain in the following way why in Polish (as well as in Moroccan Arabic mentioned above), only FA is possible in the SV order, and not CCA. For Citko, FA in SV order is the result of Agree between T head and the null pronominal D as in

⁷⁶ For Munn it is not clear how exactly the resolution of features takes place. For Johannessen also it is a problem as in her analysis CCA seems to be the default pattern and FA, which is more common crosslinguistically, is to be taken simply as a reflex of semantic agreement.

(52b) above, which is followed by movement of the whole DP to [spec, TP] position. The CCA does not take place in the SV order since for CCA, the T head would have to first establish Agree with the DP₁ as in (52a) above and then the whole &P would need to move up to the [spec, TP] position, but this derivation would involve superfluous pied-piping and thus it would violate economy, hence it is ruled out.

Also to support her structure for the FA cases, she mentions that in some cases, an overt plural pronoun is actually observed where she posits the null plural pronoun, see (53).

(53) oni, Jan I Maria ... (Polish, borrowed from Citko 2004)
 they John and Mary ...

However, I would like to point out that in (53), *John and Mary* might just be an afterthought and not really a structural complement of the pronoun *they* as is critical for Citko. We can argue that it is not a complement based on the fact that *they* and *John and Mary* cannot be shown to make a constituent together.

Furthermore, her analysis also faces the empirical problems mentioned above. For example, since in head final languages, Last Conjunct Agreement is found, Citko would need to assume that the last conjunct is higher than the first conjunct. However, as I had argued in chapter 3 above, this is not true for the head final Hindi. Also even if the last conjunct were higher, and in the SV order we could expect Last Conjunct Agreement, we would not be able to get CCA in the VS order under Citko's account since VS order in head final Hindi would require movement of the whole coordinated phrase to the right of the verb after CCA has taken place. But as Citko argued, this would involve superfluous pied-piping and thus it would violate economy, hence it should be ruled out. But we do observe CCA even in the VS order (or VO

order if the CCA is with the object rather than with the subject argument). Additionally, in the VS order, it is not the Last Conjunct Agreement, but rather First Conjunct Agreement. The presence of First Conjunct Agreement in addition to Last Conjunct Agreement in Hindi further complicates the matters as presence of both types of data would require, in Citko's analysis, the existence of both head final structure of coordinated phrase (where the last conjunct is higher than the first conjunct) as well as the head initial structure (where the first conjunct is higher than the last conjunct). But, this would be an otherwise unmotivated stipulation as this does not seem to be the case for any other phrases in Hindi as I had mentioned in chapter 3.

Additionally the mixed agreement cases mentioned above very clearly pose a problem for Citko's analysis. Since in mixed agreement cases, e.g. in Lebanese Arabic mentioned above, the verb preceding the coordinated phrase shows CCA, Citko would need to assume the bare &P structure as in (51a) above. But since the predicative adjective following the coordinated phrase shows FA, Citko would need to assume the Plural Pronoun &P structure as in (51b) above. But that is a contradiction, the same coordinated phrase cannot be assumed to have both the bare &P structure as well as the Plural Pronoun &P structure. This shows that Citko's analysis cannot be the correct analysis for CCA and FA.

Doron (2005)

Doron (2005), based on the data from Biblical Hebrew and Modern Hebrew, ascribes the variability of agreement form (i.e. getting FA or CCA) to the syntactic requirement (EPP) of the T head. She mentions that both the agreement patterns, FA and CCA, are based on the same operation AGREE as is defined in (54) below, the difference resulting from whether the EPP

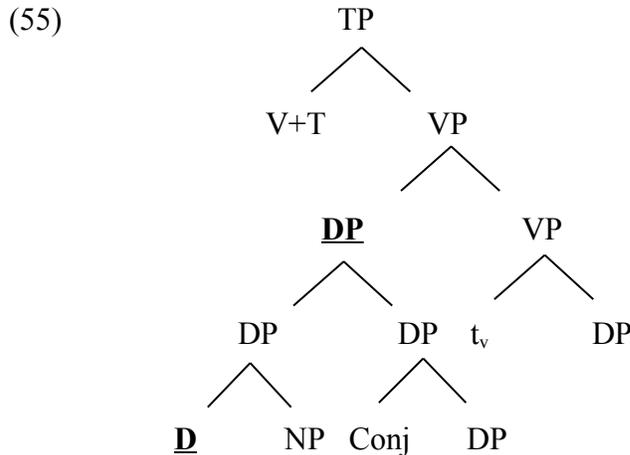
requirement of the T head is satisfied or not.

(54) *The operation AGREE (adapted from Chomsky 1998)* (Doron 2005)

- (a) The relation AGREE holds between the ϕ - features of T and the ϕ - features of the D which is closest to T (in terms of c-command) in T's domain (all the nodes dominated by its sister).
- (b) The values of ϕ - features are copied to T from the D related to it by AGREE.
- (c) If T has an EPP feature, D is raised to T.

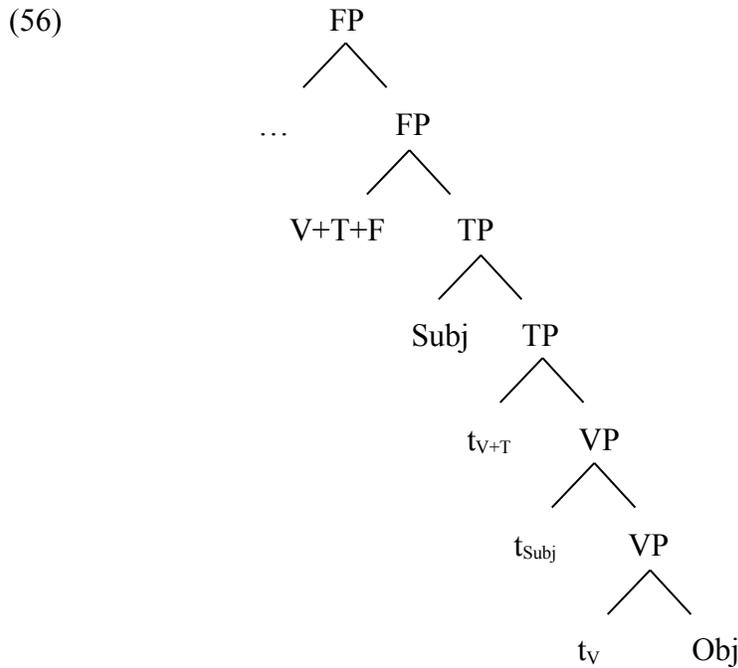
Thus according to her, the CCA and FA patterns are derived as follows.

CCA: If the EPP requirement of the T head is satisfied (say by a pure merging of an expletive), the T head just holds AGREE with the closest (in terms of c-command) D head without any movement to the [spec, TP] position. Since she assumes the asymmetric structure of coordination, the leftmost conjunct is higher in Hebrew and thus closer to the T head than the other conjunct (55), leftmost conjunct agreement pattern is achieved.



FA: If the EPP requirement of the T head is not satisfied by pure merging of an expletive, the T head agrees with the closest D head and the D is raised to the [spec, TP] position. In (55) above, now the closest D that the T head can AGREE with is the highlighted DP, i.e. the subject

(the whole coordinated DP), since this is the closest DP to T which is the minimal constituent within the closest DP that can move without violating the constraints of movement. Thus this whole coordinated DP moves to the [spec, TP] position resulting in the FA pattern. Doron mentions that the order may still appear as VS with FA but that is because of further verb movement. This is shown in (56) below.⁷⁷



Let's now consider Doron's analysis with respect to the empirical data that have presented problems for the analyses mentioned above. If we apply Doron's analysis to Moroccan Arabic, we can explain why we get CCA only in the VS order and not in the SV order. Since in the SV order, movement of the D has to take place, it requires the D to be the DP since that is the minimal constituent which can move, thus only FA can be possible with movement, not CCA. Furthermore, we can also explain the FA pattern in both the SV and the VS orders. As mentioned

⁷⁷ In (56), further object movement may take place, for example Biblical Hebrew has V2 requirement, thus some constituent, e.g. the object here, has to precede the verb.

above, when the whole coordinated DP moves up to fulfill the EPP requirement of the T head, we get SV order with FA. In Arabic also (like Hebrew), since we can see FA even in the VS order, we can consider that to be the result of further verb movement after FA is achieved.

However Doron's analysis can explain the Moroccan agreement facts, we find that it cannot explain the Last Conjunct Agreement for head final Hindi. To derive Last Conjunct Agreement, she would need to assume that the last conjunct is higher than the first conjunct, thus structurally closer to the probing T head. But as I showed in chapter 3, that is not true for Hindi. Similarly since Hindi shows First Conjunct Agreement as well as Last Conjunct Agreement, she would need to assume first conjunct as higher in the coordinated phrase for the First Conjunct Agreement constructions and the last conjunct as higher in the coordinated phrase for the Last Conjunct Agreement constructions, but as mentioned above too, Hindi does not show such variable behavior of a phrase for any other phrase in the language. Furthermore, to derive the VS order in Hindi, the coordinated subject DP would need to move up (note the heads are final in Hindi, thus the VS order requires rightward movement of the Subject, refer to the clause structure of Hindi in chapter 2 above).⁷⁸ Thus in that case, we should not expect to see CCA (First Conjunct Agreement) at all, as movement requires T to agree with the whole coordinated DP rather than just one of the conjuncts.

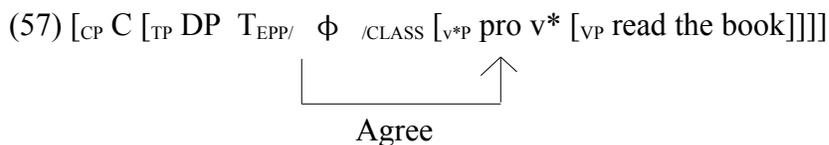
Additionally this analysis cannot explain the mixed agreement facts either. In mixed agreement, the verb in the T position may probe down, and if the EPP requirement of the T head is satisfied, the T head (V+T) can AGREE with just one of the conjuncts (the highest conjunct) resulting in First Conjunct Agreement. But the predicative adjective which follows the

⁷⁸ Instead of VS, VO may be relevant as the verbs can show CCA with the object arguments, in e.g. Hindi. But in that case also, basically the same mechanism will work as for VS, thus I do not specifically discuss that in detail here.

coordinated DP shows FA, but since no movement is involved here, FA cannot be explained using the mechanism Doron suggests. In this case we would need to stipulate an additional mechanism to get the FA on the adjective, thus we see that Doron's analysis is not sufficient to explain all the FA and CCA facts mentioned thus far.

Soltan (2006, 2007)

Soltan (2006) attempts to account for the subject verb agreement asymmetry (SVAA) in Standard Arabic where the SV orders show FA, but VS orders show partial agreement only. He assumes that the T head establishes Agree with the v*P internal subject. If the T head has an EPP feature, then a lexical subject is base-generated in the [spec, TP] position to satisfy the EPP, and a pro is generated at the [spec, v*P] position with which T establishes Agree. Note that the lexical DP subject in the [spec, TP] position is linked to the null pro in the [spec, v*P] position. Since agreement with a pro is only possible with a full T, the T in this case has ϕ as well as Class features.^{79 80} This happens in the SV order in Standard Arabic, see (57) below (suppose the target Arabic structure is “The girls read the book”). The v*+V also moves up to the T head position although not shown here.

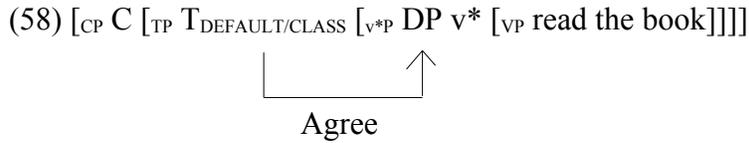


If the T head does not have an EPP feature, the lexical DP subject is base-generated in the [spec, v*P] position itself. In this case, T does not have ϕ -features either in this language, although

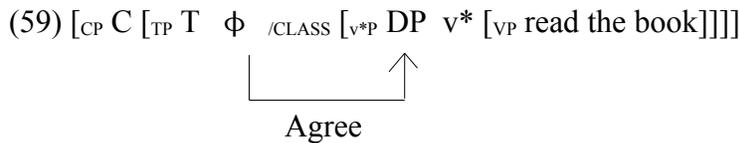
79 The Class feature is used for the gender feature here.

80 Soltan (2006) mentions that a full T is required so that the pro can be identified and the derivation converges at the interface.

it still has the Class feature. Thus when Agree is established, T gets its gender feature valued, hence we see gender agreement in the VS order in this language, see (58) below. Again the v*+V also moves up to the T head position although not shown here.



Soltan mentions that in other languages, it may also be possible that the T head appears with both the ϕ -feature as well as the Class feature when it does not have EPP. In such cases, the verb would show agreement in not just gender but also number, person etc in the VS order. He mentions that this is the case in Lebanese Arabic and Moroccan Arabic where the verbs can show agreement in all features in the VS order. Thus the VS order in Lebanese Arabic and Moroccan Arabic can be represented as in (59).



With respect to the coordinated DP subjects, First Conjunct Agreement is obligatory in the VS order in Standard Arabic, see (60a-b) below. FA is not allowed in the VS order in Standard Arabic, see (60c). In the SV order, however, the only possibility is FA (61a), First Conjunct Agreement is not allowed (61b).

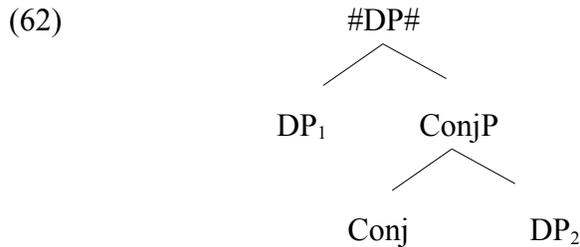
(60) (a) \int aaʔa	Zayd-un	wa	Hind-u
came-3MSg	Zayd-Nom	and	Hind-Nom
(b) \int aaʔa-t	Hind-u	wa	Zayd-un
came-3FSg	Hind-Nom	and	Zayd-Nom
(c) * \int aaʔa-aa	Zayd-un	wa	Hind-u
came-3MDual	Zayd-Nom	and	Hind-Nom

(borrowed from Soltan 2007: 193, modified for consistency)

(61) (a)	Zayd-un	wa	Hind-u	ʒaaʔa-aa
	Zayd-Nom	and	Hind-Nom	came-3MDual
(b) *	Zayd-un	wa	Hind-u	ʒaaʔa/ ʒaaʔa-t
	Zayd-Nom	and	Hind-Nom	came-3MSg/ came-3FSg

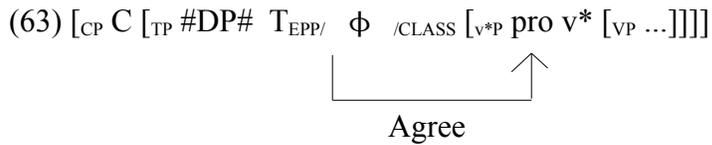
(borrowed from Soltan 2007: 193, modified for consistency)

Soltan (2007), following Munn (1993, 1999), assumes that coordinated phrases (#DP#) involve adjunction. The conjunction head together with DP₂ complement forms an adjunct of DP₁, as shown in (62) below.

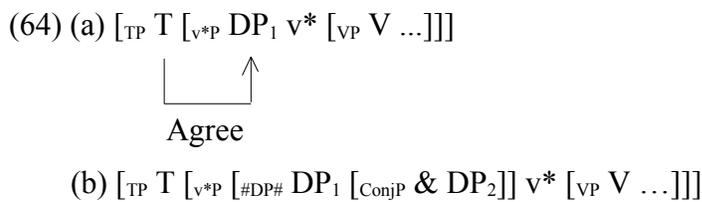


He assumes that adjuncts can be introduced noncyclically via late-Merge. Although the assumption about the postcyclic Merge in the literature (e.g. Lebeaux 1988) is based on certain LF effects which cannot be accounted for through cyclic derivation, Soltan (2007) suggests that postcyclic Merge can also have PF effects such as seen in First Conjunct Agreement. He also assumes that the ϕ -features of the root node #DP# are determined through the resolution rules. Thus FA, for him, is a result of the base generation of the whole coordinated phrase #DP# at the [spec, TP] position with a null pro with the same features as the #DP# inside the v*P. The T head establishes the Agree relation with the null pro and thus shows FA with the #DP#. First Conjunct Agreement is not allowed here since the first conjunct (or even the whole coordinated phrase #DP#) is not in the search domain of T (note it is pro that is in the search domain of T).

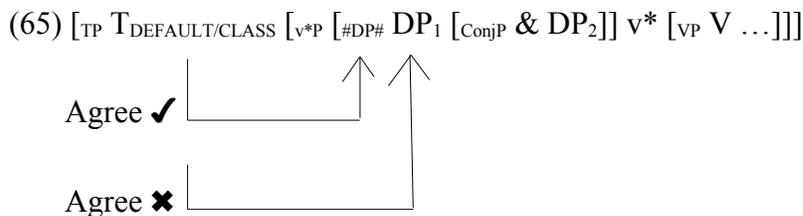
The derivation is shown as in (63).



The CCA in the VS order in Standard Arabic, according to him, is the result of postcyclic Merge of the adjunct (ConjP) and of T establishing Agree with the VP-internal subject prior to the late adjunction of the ConjP to that subject. Thus CCA can be shown in the following two steps.



For constructions which allow FA even in the VS order in languages such as Lebanese Arabic and Moroccan Arabic, he suggests that at the point when T probes down for Agree, the #DP# is available as the Goal. Hence T establishes Agree with #DP# instead of the first conjunct, this is shown in (65) below.



However Soltan's analysis explains away the problem with respect to the asymmetry in Moroccan Arabic data mentioned above, it still faces a problem with respect to the mixed agreement facts in Lebanese Arabic mentioned above. Even though this analysis can explain the First Conjunct Agreement on the verb preceding the coordinated phrase in terms of (64) above, it

does not explain the fact that within the same construction, the adjective following the coordinated phrase shows FA. The adjective showing FA with the coordinated phrase may suggest that the whole coordinated phrase is present, i.e. ConjP has already been adjoined to the first conjunct, so that when the adjective probes down for Agree (assuming it probes down and the coordinated phrase is base-generated lower than the adjective and later moves up), it has access to the #DP# and thus shows FA. In this case, the preceding verb should also show only FA under Soltan's analysis unlike the observed CCA. It may also be assumed instead that the adjective probes down but the null pro linked to the coordinated phrase is present below the adjective, while the coordinated phrase is present higher than the adjective. Even in that scenario, however, if the pro has resolved features (since the adjective shows FA), this suggests that the whole #DP# is already present. Thus when the T head probes down, it should also show FA only under Soltan's analysis. Another possibility is that there is no null pro or the #DP# lower than the adjective, #DP# is base-generated higher than the adjective only. However, even in that case, whether it is assumed that Agree can probe up too (as Baker 2008 suggests is possible in some languages) or a spec-head relation is established, the adjective showing FA suggests that the whole coordinated phrase is already present. Thus, again, CCA on the preceding verb is unexpected, and should not be possible under Soltan's analysis.

His analysis faces another problem with respect to the First Conjunct Agreement as well as Last Conjunct Agreement data from Hindi. Under his analysis, the asymmetric structure of coordination plays a part in CCA in that only one conjunct DP is present at the time of Agree and the ConjP (Conj and second conjunct DP) is adjoined later. However, since in head final languages, left adjunction takes place, we should only expect CCA with the last conjunct. But

Hindi shows First Conjunct Agreement as well suggesting right adjunction which is a property of head initial languages instead. Additionally even in the Last Conjunct Agreement case, since last conjunct (DP₂) seems to be merged prior to Agree, it seems that the Conj and the first conjunct (DP₁) form a unit ConjP which is late-merged. However, as I had shown in chapter 3, in Hindi, the first conjunct (DP₁) does not form a closer unit with the Conj than the last conjunct (DP₂). It is in fact the DP₂ that forms a closer unit with the Conj head, but this is not expected under Soltan's analysis.

Soltan's analysis faces another problem with respect to the long distance agreement (LDA) CCA data in Hindi. Hindi shows CCA even in the LDA constructions, this is shown in (66) below. Here we see that the main clause verb “caah” 'want' as well as the embedded verb “khariid” 'buy' show agreement with the conjunct that is closest to the embedded verb.

(66) sunil-ne [PRO pen aur kitaab khariid-nii] caah-ii
 Sunil-Erg pen.MSg and book.FSg buy-Inf.F want-Perf.F
 'Sunil wanted to buy a pen and a book.'

Bhatt (2005) suggests that in LDA constructions, the higher T probes down and establishes a covaluation relation with all the lower agreeing elements on its way (including the lower clause T/verb) until it reaches the element that has relevant interpretable features, the Goal. The T head establishes Agree with this Goal, and hence values its own features against the interpretable features of the Goal (and as a result the intervening agreeing heads' features are also valued). In (66), since we see Last Conjunct Agreement, the Goal would be the last conjunct. Hence in Soltan's analysis, it would be assumed that at the time of Agree, only last conjunct is Merged. However, what this implies is that Merging of the ConjP (Conj head together with the first conjunct) is delayed not just until the T head is introduced in the embedded clause but also until

all the main/embedding clause elements (i.e. the subject, verb etc in the main clause) have been Merged. This raises the question about the timing of the application of operation Merge, is it completely unconstrained as to when an element (even if it is an adjunct) is merged in a clause, i.e. is it really possible for an element to be so late-Merged that even higher clauses have been completed prior to it. Additionally here also we would need to assume that the DP_1 forms a closer unit with the Conj head, namely ConjP, which is late-Merged. But as we saw in chapter 3 above, that is not true for Hindi. It is DP_2 that forms a closer unit with the Conj head. But if that is the case, then it is not clear how a part of this unit (i.e. ConjP), viz. the Conj head and the DP_1 are late-Merged. Thus we see that Soltan's analysis cannot be the correct analysis for the CCA facts, in at least, the head final Hindi, and the head initial Lebanese Arabic.

Marušič, Nevins & Saksida (2007)

Marušič et al (2007) also assume an asymmetrical structure of coordination with first conjunct higher than the second, like the Johannessen's structure mentioned above. While accounting for the First Conjunct Agreement and the Last Conjunct Agreement in Slovenian, they argue that the First Conjunct Agreement and the Last Conjunct Agreement have independent mechanisms. They do not discuss in detail the mechanism for First Conjunct Agreement, but just mention a few possible mechanisms that have been proposed previously, e.g. equidistance from above of the ConjP and the first conjunct, etc. With respect to Last Conjunct Agreement, they suggest the following. The agreement of person and number is dissociated from the agreement for gender features in their account, thus there is an availability of the split Phi-Probe. Different probes compute the number and the gender agreement. The verb agreement with a conjunction takes

place through agreement with the ConjP for person and number features. The ConjP computes the person and number features through resolution rules, but the gender feature is not computed through resolution. The predicate agrees upward with its specifier via spec-head agreement for number agreement with the ConjP. However since ConjP does not have a gender feature, the gender agreement on the predicates can not be valued by the ConjP, thus gender agreement may target constituents which are smaller than the ConjP. The gender agreement with the last conjunct is the result of an operation second-Agree after number agreement has taken place. Since the largest constituent ConjP does not have gender value, the probe continues its search within ConjP, the closest conjunct it finds with the relevant feature, is the one that it agrees with. This relation takes place under precedence rather than dominance, resulting in linearity effects.

Their account is able to account for the empirical data mentioned above. For example, it is able to explain why in Moroccan Arabic, in the VS order CCA as well as FA are possible, but in the SV order, CCA is not possible. According to their account, Moroccan Arabic would not allow the second-Agree to take place. Thus in the VS order, the V can probe either the ConjP or the first conjunct under, say equidistance, which results in FA or CCA (First Conjunct Agreement). In the SV order, since the V is not higher above the ConjP, thus the first conjunct is not equidistant with the ConjP, thus agreement with a single conjunct is not observed. Similarly it can explain the mixed agreement facts observed in Lebanese Arabic mentioned above. Since the preceding verb is above the ConjP, it can establish Agree with either the ConjP or first conjunct resulting in FA or CCA respectively. But since the adjective following the ConjP is lower, it can only Agree with the ConjP, also Last Conjunct Agreement cannot take place since the second-Agree does not take place. Also it explains the presence of both the First Conjunct

Agreement as well as Last Conjunct Agreement within the same language (as was noted for Hindi which seemed a problem for the other accounts mentioned above).

However, Marušič et al's (2007) account does not face the empirical problems mentioned for the other analyses above, it faces the following problem. Since their account assumes that the First Conjunct Agreement and the Last (Second) Conjunct Agreement have independent mechanisms, it introduces disjunction in the analyses for the First Conjunct Agreement and the Last Conjunct Agreement. For the First Conjunct Agreement, they assume some notion such as equidistance between the ConjP and the verb, and the first conjunct and the verb. Thus when the verb probes down, it can establish Agree with either the whole ConjP or just the first conjunct. But if equidistance or some such notion is indeed involved, then we should expect to see First Conjunct Agreement more frequently than the Last Conjunct Agreement even in head final languages (at least the ones in which the coordination structure is such that the first conjunct is higher than the last conjunct as in Hindi), but we find that the Last Conjunct Agreement is more frequent in head final languages than the First Conjunct Agreement.⁸¹ However, except for the fact that they assume First Conjunct Agreement to result through a different mechanism from the Last Conjunct Agreement, I would like to point out that the account presented below in section 4.3 and Marušič et al's (2007) account are very similar. Refer to section 4.3 for more details.

Badecker (2007)

Badecker (2007) makes use of the HPSG and LFG conception of agreement. There are two types of morphosyntactic agreement features: CONCORD features (which derive from morphological

⁸¹ An additional problem with this account could be that the notion of equidistance is not well defined.

properties of nouns), and INDEX features (which are linked to the semantic/ referential properties of NPs). A conjoined NP (i.e. the CoP) cannot have its own concord features as it does not have a morphological head noun, thus the CoP can only bear index features. According to him, there are two types of languages: the I-type languages, and the M-type languages. In the I-type languages, the partial agreement (i.e. CCA) imposes interpretive constraints. Thus CCA is possible only when conjoined NPs have exclusively distributive interpretation, thus presence of NSIs bleeds CCA, as in the varieties of Arabic mentioned in ABS (1994). In the M-type languages, CCA is not in conflict with the use of elements requiring collective interpretation, e.g. Welsh.

Badecker's analysis of CCA is developed in the framework of Optimality theoretic syntax. He suggests that the difference between the partial agreement (CCA) in the two types of languages results from what type of agreement a particular grammar treats as optimal. The M-type languages use the concord agreement and the I-type of languages use the index agreement in CCA constructions. He suggests that both these types of CCA take place because the conjoined phrase as a whole lacks the agreement features of the type that the agreement relation requires. Thus, for example, in an M-type language (e.g. Welsh), the constraint that favors the concord agreement is ranked higher than the constraint that favors the index agreement. Since the conjoined phrase does not have morphological features as it lacks a morphological head N, it is optimal for the language to choose CCA. Since the anaphor binding requires index sharing (between the conjoined NP and the anaphor), but the predicate shares the concord features with the conjoined phrase, anaphor binding does not bleed the CCA in these languages. In I-type languages, CCA is possible only if the conjoined phrase lacks the index features as a result of

which the predicate has to agree with the closest conjunct's index features. Since the CoP does not have index features in the CCA constructions and the anaphor binding requires sharing of the index features with the CoP, anaphor binding is not observed with the CCA in these languages (e.g. Arabic).

The fact that the predicate agrees with the closest conjunct in case CoP does not have relevant features (index or concord) is explained by the alignment constraints $ALIGN(S_R, T_L)$ and $ALIGN(S_L, T_R)$.⁸² Badecker's analysis is able to explain the fact that some languages put a word order restriction on CCA, e.g. as mentioned above Moroccan Arabic allows CCA only in the VS order but not in the SV order, Badecker mentions Modern Greek which does not put such a restriction, it allows CCA both in the VS as well as SV order. He suggests that this depends on whether the language ranks the $F_{AITHIND}$ (An NP's index must reflect the composition of its interpretive set) above or lower than the $CP_{NPINDEX}/SpecCP$ (An NP in SpecCP must bear its own index). In Moroccan Arabic, the $CP_{NPINDEX}/SpecCP$ must be ranked above the $F_{AITHIND}$, in Modern Greek, it must be ranked lower.

To explain why in some languages, CCA is optional while in others it is obligatory, he suggests ranking of two more constraints, namely $EXTAGR_{\mu}$ (an agreement head must agree with a DP on concord features within its extended projection), and $EXTAGR_{IND}$ (an agreement head must agree with a DP on index features within its extended projection). If the $EXTAGR_{\mu}$ is ranked above the $EXTAGR_{IND}$, then CCA is obligatory, but if it is ranked lower or equally ranked as $EXTAGR_{IND}$, then CCA is optional.

Even though Badecker's analysis can explain the word order restriction on CCA (e.g.

82 $ALIGN(S_R, T_L)$ says that the right edge of an agreement source is aligned with the left edge of the agreement target. $ALIGN(S_L, T_R)$ says that the left edge of an agreement source is aligned with the right edge of the agreement target. The alignment constraints always favor the conjunct in the conjoined source NP that is the closest to the agreement target.

CCA in the VS order only but not in the SV order in Moroccan Arabic), a few things are not clear. For example, it is not clear whether the alignment constraints are ranked in relation to each other or not. If they are, then it is not clear how it would explain the fact that in Hindi, both First Conjunct Agreement as well as Last Conjunct Agreement are possible. If $ALIGN(S_R, T_L)$ is ranked above $ALIGN(S_L, T_R)$, then First Conjunct Agreement takes place, if $ALIGN(S_L, T_R)$ is ranked above $ALIGN(S_R, T_L)$, then Last Conjunct Agreement takes place. Thus, either the language would be expected to show First Conjunct Agreement or Last Conjunct Agreement but not both options. If the constraints are not ranked in relation to each other, then it might be expected that the language that shows CCA should show it in both the directions, but that is not necessarily true.

Additionally since in M-type languages, CONCORD features are ranked higher than the INDEX features, and since the CoP never has the CONCORD features (as it does not have a morphological head), it seems that M-type language should always show CCA only, never FA. But this is not found to be the case in M-type languages.

Even though this analysis can explain why in SV order, FA is obligatory in some languages (the $CP_{NPINDEX}/SpecCP$ is ranked above the $FAITH_{IND}$), it is not clear how this analysis explains the fact that in Standard Arabic, FA is not possible in the VS order at all. There is nothing in his system, as it is, that would prevent the CoP to have index features whenever the order is VS.

Probably for the mixed agreement cases as in Lebanese Arabic, it may be assumed that the $EXT_{AGR_{IND}}$ is ranked above than or equally the $EXT_{AGR} \mu$, however this should not necessarily give us First Conjunct Agreement with the preceding auxiliary and FA with the following adjective. The opposite should also be possible but it is not clear how that is prevented

under this system. Thus we see that Badecker's system also is not easily generalizable to account for CCA and FA facts mentioned thus far.

van Koppen (2008)

Van Koppen (2008), analyzing the complementizer agreement in dialects of Dutch and German (such as Tegelen Dutch, Tielt Dutch, Bavarian) suggests that the probe C head has uninterpretable ϕ - features, thus it searches for matching goals within its c-command domain. It finds two equally local matching goals, the ϕ - features of the whole coordinated phrase (which she calls the “CoP”, she assumes that the resolved features are present on the CoP) as well as the ϕ - features of the first conjunct.^{83 84} She assumes that the Agree relates the probe to both these goals simultaneously, and the derivation as such (with one probe related to two goals) is sent to PF, and hence to morphology. The decision about which of these goals determines the agreement morphology is taken in the morphology (i.e. at the post syntactic level). This decision, according to her, is based on the affix inventories present in the language, thus she reduces the variation in the agreement patterns (i.e. FA vs CCA option) to the lexicon. The relation between the probe and the goal that results in the most specific agreement morphology (i.e. expressing most features) is spelled out. She provides an example from Tegelen Dutch, see (67) below. Note that the C head shows the agreement morphology of the first conjunct, thus 2Sg features. Thus the relation between the probe C head and the 2Sg-goal (first conjunct) is spelled out, rather than the probe C head and the 1Pl-goal (CoP). She presents the

83 Van Koppen (2008) also assumes an asymmetric structure of coordination, similar to Johannessen's structure above, with the first conjunct higher than the last in Tegelen Dutch and Tielt Dutch.

84 This is similar to Babyonyshev (1996) above, note she assumed that the T head was equidistant from both the ConjP and the first conjunct in the Russian data she studied. Also Marušič et al (2007) mention a possibility of equidistance from above with the ConjP and the first conjunct for the FA vs First Conjunct Agreement cases in Slovenian.

complementizer agreement paradigm, copied in (68) below, which shows that only with a 2Sg subject, the C carries an agreement affix. Thus we see that the most specific agreement morphology is chosen here when the C head shows agreement with the first conjunct.

(67) Ich dink de-s doow en ich os kenne treffe
 I think that-2Sg [you.Sg and I].1Pl each.other.1Pl can.Pl meet
 'I think that you and I can meet.'

(borrowed from van Koppen 2008: 129, modified for consistency)

(68) Complementizer Agreement in Tegelen Dutch (borrowed from van Koppen 2008: 130)

	CA
1Sg	det
2Sg	de-s
3Sg	det
1Pl	det
2Pl	det
3Pl	det

She argues that since the relation between the probe C head and the whole CoP leads to a less specific agreement morphology, FA should not be possible. She shows that this prediction is borne out, see her example from Tegelen Dutch in (69) below.

(69) * ... det doow en ich os treff-e
 that [you.Sg and I].1Pl each.other.1Pl meet.Pl
 (borrowed from van Koppen 2008: 130, modified for consistency)

Using an example from Tiel Dutch (70), where FA takes place instead of the First Conjunct Agreement in the same context, and the complementizer agreement paradigm in Tiel Dutch as shown in (71), she shows that even in Tiel Dutch the agreement relation between the probe and the goal is chosen in the morphology which results in the form that is more specific. She assumes

(b) ... daß-ds du und d'Maria an Hauptpreis gwunna hab-ds
 that-2Pl [you.Sg and the Maria].2Pl the first.prize won have-2Pl
 '... that Maria and you have won the first prize.'

(borrowed from van Koppen 2008: 134, modified for consistency)

(73) Complementizer Agreement in Bavarian (borrowed from van Koppen 2008: 133)

Feature specification subject	Affix on the complementizer
1Sg	
2Sg	-st
3Sg	
1Pl	
2Pl	-ts
3Pl	

She shows that when there is an intervening modifier, for example a focus particle, that modifies the CoP, the First Conjunct Agreement tends to become degraded. She suggests that due to the presence of the intervening modifier, the CoP and the first conjunct are no longer equally local to the probe C head, note CoP is only c-commanded by C head, but the first conjunct is c-commanded by both the C head as well as the modifier in this case. The fact that the presence of the intervening modifier does not result in complete ungrammaticality of the First Conjunct Agreement, just its degradation, according to her, is because there is ambiguity as to whether the modifier modifies the whole CoP or just the first conjunct. If it modifies just the first conjunct, in that case the CoP and the first conjunct are equally local to the C head (both c-commanded by just the C head) and thus FA as well as First Conjunct Agreement are possible.

She also talks about the agreement on the T head besides the C head mentioned above. She suggests that both involve the same mechanism, however in case of T, we do not see CCA in Tegelen Dutch or Bavarian in SV order due to the fact that the coordinated subject

moves out of the c-command domain of the T head but it does not move out of the c-command domain of the C head. She assumes that Agree takes place at Spell Out and copies of movement are inaccessible for Agree. She mentions that the idea that the internal structure of the copies is not available to Agree could be either due to copies not having any internal structure at all, or due to their being opaque for agreement relations for some reason even though they have internal structure. Thus when the coordinated subject moves out of the c-command domain of the T head to [spec, TP], it leaves a copy at its base position. The T head establishes Agree with the copy, since the copy's internal structure is not available to T head, it cannot establish Agree with the first conjunct simultaneously. Hence only the possibility of FA is present in this case.

Van Koppen's analysis can explain the Moroccan Arabic data (mentioned as a problem above for many previous analyses) about CCA being acceptable in the VS order but not in the SV order. In the VS order, the T head has access to the internal structure of CoP, thus it can establish simultaneous Agree with both the CoP and the first conjunct. But in the SV order, when the coordinated subject has moved to [spec, TP], the T head establishes Agree with the copy of the CoP which is left behind in its base position (which is in the c-command domain of T). Since the internal structure of the copy is not accessible to T, it only agrees with the CoP, not the first conjunct. This results in the possibility of only FA and not CCA in SV order.

However, her analysis also faces problems with respect to the Hindi data about the possibility of both the First Conjunct Agreement and the Last Conjunct Agreement, and also the proximity effects. She assumes that the possibility of FA and CCA is due to the closest conjunct and the CoP being equally local to the probing head structurally (i.e. both being c-commanded by the same nodes), and that the probe does not establish Agree with the other conjunct as that is

not local enough to the probing head (as the first conjunct or the CoP is). Then under her analysis, it is not possible to get both First Conjunct Agreement and Last Conjunct Agreement within the same language. If the language has the first conjunct higher than the other, then the other conjunct is not equally local to the probe due to an additional c-commanding node, the first conjunct, thus only First Conjunct Agreement but not the Last Conjunct Agreement should be possible. Similarly if the last conjunct is higher, then only Last Conjunct Agreement and not the First Conjunct Agreement should be possible since in that case the first conjunct is not as local to the probing head as the last conjunct is. But this prediction is not borne out true. As I mentioned above, in Hindi (and many other languages, such as Slovenian, Serbo-Croatian) both First Conjunct Agreement as well as Last Conjunct Agreement are possible.

Also she assumes the role of lexicon (most specified affix) in the variation with respect to the FA and the CCA. If both the relations result in equally specified forms, then the PF mechanism randomly chooses one or the other for her. But the Hindi data show that the process of choosing one or the other form is not completely random, it seems to have some justification in terms of processing demands on the speaker, as the linear proximity decreases, the use of CCA also declines/ is completely unacceptable.

Additionally, with respect to the Lebanese Arabic data about the mixed agreement mentioned above, van Koppen's analysis may explain one part, the First Conjunct Agreement with the verb preceding the CoP. Since the verb (T head) has access to the internal structure of the CoP in its base generated position, either FA or CCA are possible, depending on which Agree relation is spelled out at PF (the relation between the V/T and the CoP or the relation between the V/T and the first conjunct). But to explain why the adjective that follows the CoP

cannot show First Conjunct Agreement but only FA, she needs to assume a separate mechanism to achieve agreement between the adjective and the CoP (since the CoP is not in the c-commanding domain of the adjective head) and which would also need to block agreement with the first conjunct somehow. In van Koppen (2005), she argues against the existence of spec-head mechanism for agreement, thus we cannot take this to involve spec-head agreement under her analysis, hence it is not clear how, under her analysis, we can achieve the agreement between the adjective following the CoP and the CoP. Thus we see that her analysis also is not able to explain the CCA and FA facts in other languages mentioned above.

Bošković (2009, 2010)

Bošković (2009) attempts to account for the CCA phenomenon in Serbo-Croatian (SC), and generalizes it to Russian and other languages in Bošković (2010). He also assumes an asymmetric structure of coordination with the first conjunct being higher than the second conjunct (note both Serbo-Croatian and Russian are head initial languages), similar to the spec-head structure mentioned above. His mechanism to derive the CCA and FA constructions makes use of the relation Agree. Below I describe the mechanism he proposes together with the assumptions he makes use of.

He assumes that if a feature is lexically unvalued, then it needs to receive valuation during the syntactic derivation through Agree. The uninterpretable features need to be deleted but they can be deleted only if they are valued. Thus the unvalued uninterpretable features need to be valued through Agree before deletion. Note that he assumes that the uninterpretable features can be valued or unvalued. With respect to the number and gender features of the probes

and the goals, he assumes the following.

(74)

	Number feature	Gender feature
Probe (e.g. participles, verbs)	Uninterpretable and unvalued	Uninterpretable and unvalued
Goals (e.g. NPs in SC)	Interpretable and valued	Uninterpretable and valued

He assumes that the &P is specified for number, he mentions that the computation of the number at the &P level is semantically motivated. The &P has plural specification in SC (he mentions that in some languages, it might not be specified, for example, in Spanish). Although the &P is specified for the number feature in SC, it is not specified for the gender feature.

He assumes that agreement is established through the operation Agree, which consists of probing, matching and valuation. Thus the probing head first looks for an appropriate goal with the relevant matching features (he assumes that multiple Agree is possible, thus there can be more than one goal for a probe). Then feature matching takes place as a result of which the unvalued features of the probe are valued. Also he assumes that the valued uninterpretable features are deleted after Match. Also if the probing head has an EPP feature, then the maximal projection of the valuator (i.e. the maximal projection containing the goal) is pied-piped to the specifier position of the probing head after Agree. For SC, he assumes that the probe establishes Agree with two separate valutors (goals), &P for the number feature and the first conjunct for the gender feature in First Conjunct Agreement constructions. But if the probe has an EPP feature and thus requires pied-piping of the goal, since there are two separate goals, the &P and the first conjunct, there is a conflict as to which goal should be pied-piped. Thus pied-piping is

prevented in such a case. But since pied-piping cannot be performed on the basis of valuation, valuation itself is blocked. In this scenario, there are two possibilities in the grammar, the default agreement (gender feature: M), and secondary Agree (with the next conjunct in the &P). Below I describe the scenario when the probe has the EPP feature with the secondary Agree option in more detail.

The probe (e.g. the participle in SC) matches &P and NP₁ (the first conjunct). But matching does not result in valuation as valuation fails to uniquely determine pied-piping element. However the gender feature of the NP₁ is deleted since the valued uninterpretable features are deleted after Matching. Thus the most prominent conjunct NP₁ is left somewhat inert, which in turn allows the second conjunct to participate in the agreement relation. Hence, at this point secondary Agree occurs with the probe (participle) matching &P and NP₂ (the second conjunct). Since NP₂ is not a candidate for pied-piping (it is not extractable out of the coordinated phrase, it being in the complement position), now there is no conflict. Thus the &P is pied-piped to the [spec, PartP]. This results in the second conjunct agreement (i.e. Last Conjunct Agreement) for fronted subjects.

In SC, CCA cannot take place if the first conjunct is Sg. Bošković accounts for this observation as follows. The ϕ - probing head is a single probe for both the number and the gender feature, not a split probe in SC. Thus the probe undergoes multiple Agree, as mentioned above, with the &P and NP₁. If the number features mismatch on the &P and NP₁ (even though the participle probes NP₁ for the gender feature), there is a (number feature) valuation conflict, thus the number feature cannot be valued on the probe. It cannot even initiate secondary Agree since unlike the gender feature, where the secondary Agree was possible because the feature was

uninterpretable and so deletable, the number feature is interpretable and so cannot be deleted.

Here movement to [spec, PartP] will not change the situation, also even if NP₂ were Pl, it will not change the situation.

Thus Bošković mentions that in SC, full First Conjunct Agreement or full Last Conjunct Agreement never takes place. The number agreement is with the &P and the gender agreement is with the NP₁ or NP₂, so the probe matches disjoint valutors in conjunction cases, however both the valutors &P and the conjunct need to have the same value for the number feature (i.e. Pl).

Now let's consider how Bošković's analysis fare with respect to the empirical data found in other languages. We see that it is able to explain the Moroccan Arabic data that were a problem for some of the previous analyses mentioned above. Bošković mentioned that in some languages &P is specified while in others it may not be or it may be optionally specified for number feature. Looking at data in Moroccan Arabic, we can assume that the &P is optionally specified in the language (note it is possible to get Sg agreement on the verb if the closest conjunct is Sg). In the VS order, if the &P is not specified (for n and g), then CCA can take place. However, if the &P is specified for n and g, then the verb just shows FA with the &P, no further probing takes place. In the SV order, if the &P is not specified for n and g, then First Conjunct Agreement takes place, but then since there are no multiple valutors, the first conjunct should be able to be moved up to [spec, TP], and we find that that is possible in Arabic (i.e. the following order with First Conjunct Agreement: NP₁ V t_{NP1} & NP₂). If the &P is specified, only FA takes place as no further probing is needed, so only the &P can move as that is the only valuator resulting in the SV order with FA.

However, Bošković's analysis is able to explain the Moroccan Arabic data, it faces a number of problems as I mention below. First of all, it is not able to explain the linear adjacency/proximity requirement for CCA in languages. It has been observed that some languages such as Tsez have a strict adjacency requirement for CCA to take place (refer to BBP 2009, Polinsky 2009), other languages such as Hindi show CCA based on linear proximity (see section 4.3.1 below), thus although they do not require the goal to be strictly adjacent to the probe, but as the length or the number of intervening phrases increases between the probe and the goal, the tendency to use CCA goes down across speakers. There is nothing in Bošković's system which could explain this dependency of the CCA on the linear adjacency/proximity between the probe and the goal. If the CCA mechanism involves probing down structurally only inside the &P, then it is not clear why the CCA (e.g. First Conjunct Agreement) cannot take place when there is intervening material between the verb and the &P in Tsez, i.e. why CCA is dependent on the linear adjacency/proximity. In fact, even Bošković (2009) mentions that a part of data from SC, given below in (75), is not accounted for by his system, he leaves it for future research mentioning a possible connection with processing effect due to features on the linearly closer intervener (the second conjunct here). Note in his system, if the first conjunct is Sg, then First Conjunct Agreement as well as Last Conjunct Agreement is blocked. This is so because when the probing head probes down structurally inside the &P, the number features of the &P and the highest conjunct it comes across need to match in number, otherwise CCA is not possible and the only grammatical possibility (generally) is for the participle to appear with the default gender feature (M). But the SC sentence in (75) below (his original example (45g)) shows Last Conjunct Agreement, i.e. NPI (neuter, plural) marking, instead of the default gender feature M

(masculine). But it is not ungrammatical. He mentions that the intervening conjunct (i.e. the second conjunct) between the first Sg conjunct and the participle might be affecting the features on the participle, note both are NPl.

(75) ? Jedno tele I sva paščad su juče prodana
 one calf.N and all dogs.N are yesterday sold.NPl
 'One calf and all the dogs were sold yesterday.' (Bošković 2009: 22)⁸⁵

Another potential problem for Bošković's analysis is described as follows: the first conjunct is considered higher in the coordination structure since SC is a head initial language. Thus when the participle probes down, it establishes Agree with the first conjunct rather than with the last conjunct (in the default word order), resulting in CCA (First Conjunct Agreement). If this is applied to a head final language, such as Hindi, it might be assumed that the last conjunct is higher than the first conjunct, which results in probing the rightmost conjunct in head final languages in the default word order (which is S(O)V in head final languages). But as mentioned above, the last conjunct is not higher than the first conjunct in head final Hindi.

If the structure of coordination in Hindi is such that the first conjunct is higher (as was argued to be the case for Hindi in chapter 3 above), then in the S(O)V order if the &P is in-situ, we should get First Conjunct Agreement but we do not get it, we get Last Conjunct Agreement instead in the S(O)V order.⁸⁶ So this may suggest that the movement is involved, but then the question is what moves (i.e. which element is pied-piped, the &P or the agreed-with conjunct). Since in coordination in Hindi, we don't always get Pl number on the verb (see (42) and (45) above), it suggests that the &P in Hindi is not always specified for number, it is

⁸⁵ Also refer to his example (37d), and footnote 27 in Bošković (2009).

⁸⁶ Note that the Hindi verbs can even show CCA with the object arguments if the subject arguments are not in the absolutive form. The agreement takes place with the highest absolutive argument, refer to chapter 2 above for details about Hindi agreement.

optionally specified.⁸⁷ When it is not specified, then the probe can fully Agree with the first conjunct. Then that is the only goal that can be moved to [spec, TP], since there are not multiple goals there and hence no conflict as to which element should be pied-piped.⁸⁸ Thus we should get First Conjunct Agreement on the verb and the following word order (assuming that CCA is with the object argument): [NP₁ [Subj-Erg [t_{NP1} [& NP₂]]] V-T], this is illustrated by (76b) in Hindi. But this is not acceptable. This shows that the NP₁ cannot move up, but it is not clear why it cannot move, under Bošković's system it should be able to move as there is no other valuator as mentioned above. It looks like the whole &P moves up with first conjunct's features deleted after match, so that the probe can establish secondary Agree with the last conjunct resulting in Last Conjunct Agreement, see (76c). Even though it looks like there is whole &P movement and we do see Last Conjunct Agreement, but it is not clear why first conjunct's features should be deleted here to allow for secondary Agree (there is matching, thus the features would be deleted but since there is no conflict about pied-piping, the valuation should not be cancelled, and thus there should not be any possibility of secondary Agree), and also it is not clear how the whole &P movement takes place here in the first place (to result in the SV order, or OV in cases of object agreement) since the &P is not specified for number feature and thus is not a valuator.

87 Following Bošković's system, we cannot say that the &P in Hindi is specified for n feature as Pl and the g feature of NP₁ gets deleted which allows secondary Agree with the NP₂ for the still unvalued g feature on the verb in S(O)V constructions in Hindi, because the following ungrammatical sentence in (xv) shows that the verb cannot get Pl feature from the &P while getting its g feature from the last conjunct NP₂.

(xv) * patte	aur	lakRii	gir	rahii	haiM
leaves.MPl	and	wood.FSg	fall	Prog.FSg	Pres.Pl

'The leaves and the wood is/are falling.'

88 However, it does not seem to be the case that the object argument moves to the [spec, TP] position, at least in Hindi it seems that only the subject arguments can appear at the [spec, TP] position. But which position it is where the maximal projection of the valuator moves is not the issue here, it could even be some other head than T which has the EPP feature to whose specifier the maximal projection of the valuator has to move to.

- (76) (a) [_{VP} nikhil ne [_{VP} [&P liichii aur seb] khaa-yii]]
 Nikhil Erg [Lichi.FSg and apple.MSg] eat-Perf.FSg
 [NP₁ & NP₂]
 Subj Obj V
 'Nikhil ate a lichi and an apple.'
- (b) * [_{TP} liichii₁ [_{VP} nikhil ne [_{VP} [&P t₁ aur seb] t_v]] khaayii]
 NP₁ Subj --- & NP₂ V
- (c) [nikhil ne [_{TP} [&P liichii aur seb] [_{VP} t_{Subj} [_{VP} [t&P t_v]]] khaayii]
 Subj NP₁ & NP₂ V

The mixed agreement data also would be problematic as since First Conjunct Agreement takes place with the verb that precedes the &P, it must be the case that &P is not specified for number in that construction. Thus the probe (verb) fully Agrees with the first conjunct. But since the &P does not have the PI feature, it is not clear how, in Bošković system, the predicative adjective which follows the &P shows the PI feature (FA) with the &P when the &P is not specified for number in that construction. It may be the case that in Bošković's system, one might need to assume two agreement configurations, the participle which is higher than the &P is able to establish Agree with it, but the predicative adjective establishes spec-head agreement with the coordinated phrase. But even in that case, we would need some way for the &P to have PI feature so that the predicative adjective can show that feature.

Thus we see that Bošković's analysis also faces some of the empirical problems faced by other analyses mentioned above.

Bhatt & Walkow (2010)

Bhatt & Walkow (2010) continue the work on CCA in Hindi from BBP (2009), they also assume

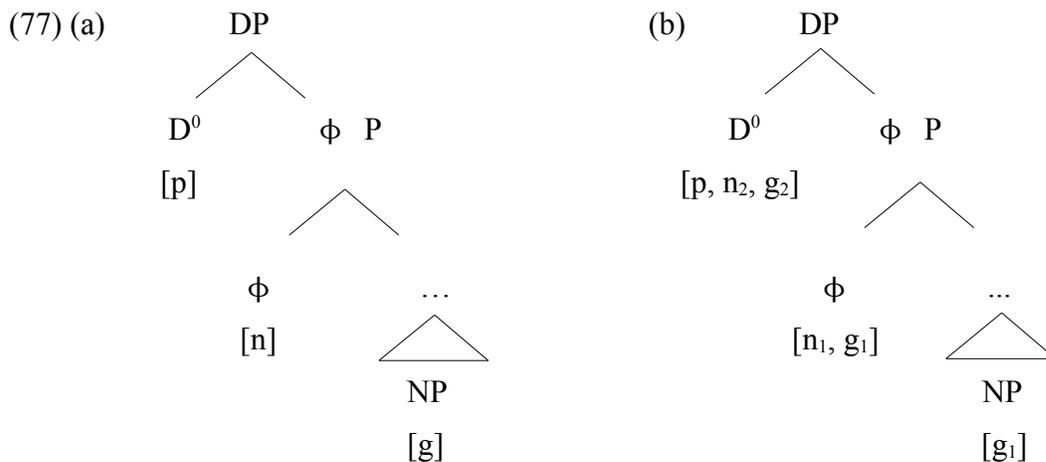
that agreement takes place in two stages, viz syntax and PF as in BBP (2009), they also assume following BBP (2009) that syntax identifies the target by establishing a relation with it (and thus restricts the search space for finding ϕ - features to be realized on the target (probe in recent minimalist terminology)) and PF decides which features in it are expressed morphologically, thus ϕ - features are realized in the PF which is affected by conditions of linear proximity. Their proposal differs from BBP's proposal in that they associate CCA asymmetry between the subjects and objects with another asymmetry between them with respect to the person agreement. In Hindi the verbs tend to show CCA with coordinated objects but not with coordinated (typical) subjects. Also the verbs in Indo-Aryan languages in general show person agreement with the subjects but not with the objects.⁸⁹ Below I present their proposal, however I discuss then why it is not the correct account for CCA facts in Hindi.⁹⁰ However they have formalized the linear proximity condition which BBP (2009) and B&B (2010) had proposed, I will take Bhatt & Walkow's formalization to express the linear proximity condition in my proposal below (with some modifications) as it states the linear proximity very clearly. But let's first look at their account.

They assume that the absence of person agreement between the object and the verb as well as the inaccessibility to the features of &P object to the verb both result from the fact that object's case is checked prior to T establishing Agree with it, i.e. there is dissociated agreement

89 Although in Hindi, we cannot observe this asymmetry due to the fact that in Hindi when the objects are overtly case marked, the verbs cannot agree with them, and the 1st and 2nd person pronominal objects are invariably overtly case marked in Hindi. Bhatt & Walkow show the asymmetry with respect to person agreement in another Indo-Aryan language Gujarati; in their examples, when the verb agrees with the subject, it shows person features but when it agrees with the object, person agreement is absent.

90 Thus the fact that there is an asymmetry between the subjects and objects with respect to CCA as well as with respect to person agreement may just be a coincidence rather than both resulting from the same phenomenon. Note that Bhatt & Walkow (2010) take the two asymmetries as properties derived from the fact that object agreement is an instance of dissociated agreement.

between the object argument and the verb. Following Ritter (1995), they assume that the features originate as in (7a) below. Thus the gender feature originates on the noun, number feature is introduced by a higher functional projection ϕ P, the gender feature is also present there. The person feature originates in D, D also acquires the number and gender features from its complement, it has the value identical copies of number and gender features in ϕ P. This distribution of features is shown in (7b) below.



When accusative case is assigned to the object by v , the features in D are checked and they become inaccessible for further Agree. Hence when T probes the object argument, it cannot value its features on the object argument in the syntax. Thus T resolves its features in the PF. Since after Accusative case checking D's features become inaccessible, T can now access features of the ϕ P only, not of the D. Since only D has the person features, and its features are not accessible, object agreement only shows number and gender features, it cannot show person features.

With respect to the features on the coordinated phrases &P, they assume that ϕ Ps are computed on &P such that a link is established between the features of the individual

conjuncts and those of the &P. The *v* head assigns case to &P and checks its *p*, *n*, *g* features. Since features on &P are linked to features in the D-layers of the conjuncts, they also become inaccessible. Thus the object case assignment deactivates &P and with it the features in the D-projections of the conjuncts. This accounts for impossibility of FA (resolved agreement) with T as well as absence of person agreement.

For CCA, following BBP (2009) and van Koppen (2008), they assume that syntax identifies the phrase with which Agree is established, and PF decides which features are expressed morphologically on the verb. As mentioned above, when T probes the object argument, it cannot value its features on the object argument in the syntax. Hence T gets its features in the PF. At this level, linear proximity plays a role. When the verb follows the coordinated phrase, it shows Last Conjunct Agreement. When it precedes the coordinated phrase, it shows First Conjunct Agreement. Before describing their formalization for linear proximity, let me mention that they assume that three elements take part in the computation of CCA: the agreement controller (*C*), the anchor (*A*) which is the element with which T head establishes Agree, and the target (*T*) which is the node that provides the ϕ - features expressed on the controller.⁹¹ Thus syntax establishes the relation between the *C* and *A*. PF figures out based on linear proximity which part of *A* is *T*, so that this *T*'s features can be expressed on *C*. D and &P cannot be *T* since their features are already checked during Accusative case assignment. Hence ϕ - phrases can be potential *T*s. Taking the above mentioned elements (*C*, *A*, *T*) as relevant for the computation of CCA, they formalize linear proximity adopting a system like Kayne's (1994) as follows. The linear order is established at PF by mapping the c-command relations

91 To avoid any confusion, note the abbreviation for the tense head, T, is written in the default font, and the symbol for target, *T*, is written in the bold italics.

between nodes into relations of linear precedence. The expression $\langle a, b \rangle$ means node a precedes node b . Linear proximity is stated as follows in Bhatt & Walkow (2010: 7-8).

- (78) Whichever linear relation holds between C and A , T is the unique ϕ_i such that
- (a) ϕ_i is contained in A , and
 - (b) there is no ϕ_j different from ϕ_i and contained in A such that the same linear relation holds between ϕ_j and ϕ_i as holds between A and C .

It seems that there is a typo in their clause (b) as the relation between ϕ_i and ϕ_j seems to be reversed in (78b) here. For the definition to represent the linear proximity facts, we would instead need to assume the following:

- (78) (b') there is no ϕ_j different from ϕ_i and contained in A such that the same linear relation holds between ϕ_i and ϕ_j as holds between A and C .

This definition of linear proximity ensures that there is no intervening possible agreement target inside A that stands between the T and C . According to clause (b') in the definition, if the order is $\langle A, C \rangle$, i.e. the verb follows the coordinated phrase, then Last Conjunct Agreement takes place. T , associated with the last conjunct, is the unique ϕ -feature containing node ϕ_i in A , for which there is no ϕ_j that it precedes as the A precedes the C , i.e. $\ast \langle \phi_i, \phi_j \rangle$. The ϕ -feature containing node associated with the left conjunct cannot be the T as that would violate the clause (b'). If, on the other hand, the order is $\langle C, A \rangle$, i.e. the verb precedes the coordinated phrase, then First Conjunct Agreement takes place. T , associated with the first conjunct, is the unique ϕ -feature containing node ϕ_i in A , for which there is no ϕ_j that it follows as the A follows the C , i.e. $\ast \langle \phi_j, \phi_i \rangle$. The ϕ -feature containing node associated with the rightmost/last conjunct cannot be the T as that would violate the clause (b').

Since the verb shows only the ϕ - features of the conjuncts, never of any other absolutive DPs inside the &P (e.g. DP inside a prenominal modifier such as a relative clause etc), Bhatt & Walkow suggest that this happens since syntax identifies the &P and the &P is linked to the maximal projections of its constituent DPs (the conjuncts) which in turn are linked to the features in their corresponding ϕ Ps. Since the search space is restricted to the &P at PF, PF only exploits the links between the &P and its constituents (the conjuncts).

They present data where scrambling creates orders such that the coordinated object is between the two agreeing elements (e.g. a participle and an auxiliary), see (79) below. Here what we observe is that if the participle and the auxiliary show agreement with the conjunct that is closest to them and the two conjuncts have different number and/or gender features and thus the two agreeing elements show different features, then the construction is ungrammatical, see (79a,b). If, on the other hand, the two agreeing elements show features which happen to be same because the two conjuncts had the same features (79c) or because of syncretism (79d), the construction is grammatical.

(79) Order: V [O & O] Aux

- (a) * riinaa-ne gaa-yaa ek gaanaa aur ek nazam thii
 Rina-Erg sing-Perf.MSg one song.MSg and one nazam.FSg Pst.FSg
 'Rina had sung a song and a nazam.'
- (b) riinaa-ne gaa-ye do gaane aur ek giit ??the / *thaa
 Rina-Erg sing-Perf.MPl two song.MPl and one giit.MSg Pst.MPl/Pst.MSg
 'Rina had sung two songs and a giit.'
- (c) riinaa-ne gaa-yii ek gazal aur ek nazam thii
 Rina-Erg sing-Perf.FSg one ghazal.FSg and one nazam.FSg Pst.FSg
 'Rina had sung a ghazam and a nazam.'

(d) riinaa-ne gaa-yii kai nazmeM aur ek gazal thii
 Rina-Erg sing-Perf.FSg many nazam.FPl and one ghazal.FSg Pst.FSg
 'Rina had sung many nazams and a ghazal.'

(borrowed from Bhatt & Walkow 2010: 3, modified for consistency)

Bhatt & Walkow take these data to mean that the grammar is sensitive to feature mismatch between the conjuncts, and according to them this means that the features of both the conjuncts are accessed, i.e. the conjunct agreement is computed separately for the participle and the auxiliary. They suggest that the constructions are ungrammatical unless the two controllers (participle and auxiliary) show the same features because there is a syntactic relation between the T head and other agreeing projections as a result of which the T's features are also transmitted to these agreeing heads. Thus the agreeing heads have two sets of features, the features that they probed themselves as controllers and the features that they got as a result of transmission from the T head. If the two sets of features cannot be realized in a single form, the structure crashes. If the two sets of features are identical or they have a syncretic form, the structure is grammatical.

However, I argue that these data do not mean that the grammar is sensitive to feature mismatch between the conjuncts and the participle and the auxiliary compute agreement separately from their respective closest conjunct. This same data can be taken to show that in Hindi the participle and the auxiliary need to agree with the same element (unlike Lebanese Arabic mentioned above which shows mixed agreement).⁹² Thus the (un)grammaticality of the sentences in (79) above can be explained as follows. (79a) is ungrammatical since here the participle and the auxiliary seem to probe separately (and they probe separate elements) which

⁹² Baker (2008) also mentions, for Hindi, in the appendix table on p 249 that there is single agreement rather than double agreement with the agreed-with argument in the auxiliary-verb constructions. For Arabic, it is specified as double (p 248).

does not happen in Hindi verbal complexes. In Hindi, as mentioned in chapter 2 above, when the highest head T probes down, it establishes codependency relation with all the agreeing verbal heads (e.g. aspect etc) on its way probing down, resulting in verbs as well as auxiliaries all showing agreement features of the same element. (79b) is fine with resolution as in that case scrambling of the verb participle takes place after agreement has taken place. (79b) with CCA on the following auxiliary is unacceptable as the scrambled participle shows that resolution has taken place, if both participle and the auxiliary are part of the covaluation relation, then we do not expect them to show features of separate elements, participle showing features of the whole coordinated phrase and the auxiliary showing features of the closest conjunct only. The grammaticality of (79c) may also be taken to imply that after Last Conjunct Agreement has taken place, and the participle and the auxiliary both show agreement features of the last conjunct, the participle is scrambled to pre CoP position. This construction is not odd since even if the language user is gardenpathed and does not realize until later that the object is a coordinated phrase, the participle's features happen to match with the first conjunct DP (s)he comes across. The same explanation can be used for (79d) as well, even in case the language user is gardenpathed, due to syncretism (FSg and FPl can have the same form), the participle's features happen to match with the DP the language user comes across first. The ungrammaticality of (79d'), where the participle does show FPl form itself rather than FSg, shows that the participle and the auxiliary have to show features of the same element.

(79) (d') *	riinaa-ne	gaa-yiiM	kaii nazmeM	aur	ek gazal	thii
	Rina-Erg	sing-Perf.FPl	many nazms	and	one ghazal	Pst.FSg

Also we can explain why a construction such as (79a') would not be acceptable.

separately as well. And then both sets of features are compared.

However, the mixed agreement data in languages where it is observed as in Lebanese Arabic mentioned above can be explained through both the accounts. In my account, we would need to assume that in mixed agreement languages each of the agreeing heads probes separately, they do not establish covaluation relation as Hindi does, this results in the possibility of mixed agreement in these languages. In Bhatt & Walkow's account, we would need to assume that in such languages each of agreeing heads probes separately, there is no syntactic relation between the T head and the other agreeing heads and thus no transmission of features takes place from the T head to these other agreeing heads. As a result of this the agreeing heads do not have two sets of features in these languages and thus there is no reason for the structure to crash (in case of two sets of features, the structure crashed if the two sets of features did not match/result in the same morphological form) and hence mixed agreement is allowed.

Besides the fact that the data in (79) does not necessarily have the interpretation that they suggest, as I have discussed above, there are a few other problems with their account. First of all this account is not generalizable to all languages as it does not account for the CCA facts in languages such as Tsez which have linear adjacency requirement rather than linear proximity requirement (refer to BBP 2009, also see section 4.3.1 below for examples). However this problem can be resolved by adding another condition to the linear proximity statement as I add in (100) below.

However their account has another problem in accounting for the data discussed in this dissertation which is not resolvable. Note that their account is based on the assumption that the resolved agreement is absent with the object arguments. But I have found evidence for

resolved agreement as well with the object arguments (even though the CCA seems to be the preferred option) in surveys with native Hindi speakers as well as the Hindi corpus data.⁹³ See example (11) in BBP (2009: 71), copied here as (80) below, modified for consistency. Here the verb shows the resolved agreement MPI even though the agreement is with the coordinated object.

(80) oh par us-ne to kelaa aur garii khaa li-ye!
 Oh but he-Erg Emph banana.MSg and coconut.FSg eat take-Perf.MPI
 'Oh, but he ate the banana and the coconut!'

Recall, for Bhatt & Walkow (2010), the features on &P are linked to features in the D-layers of the conjuncts, and hence they become inaccessible when the v head assigns case to the &P and checks its p, n, g features, this results in CCA with the object argument (due to access to the features in the ϕ P of individual conjuncts only). This account cannot be the correct account for agreement facts in Hindi (at least the dialect represented by me, my Hindi language informants, and the corpus from Dainik Jagaran) as it does not allow the possibility of resolved agreement with direct objects at all. Since in Hindi we do find resolved agreement too, it is not clear, under their account (which claims to explain the two asymmetries based on the same phenomenon), why it is that the p agreement features are inaccessible to the verb but &P features are not when agreement is with the object argument.

Additionally, BBP (2009) show that in Tsez also we do see CCA as well as FA with

93 Whether FA is allowed or not seems to depend on factors such as whether determiners/quantifiers/modifiers are used with the conjuncts (and which ones) or they appear in bare form, e.g. the use of quantifier "ek" 'one' with the noun seems to enforce CCA (xvi), but a bare noun does not seem to enforce CCA (xvii).

(xvi) kal maiM-ne park meiM ek hiran aur ek batak dekhi-ii/ *dekh-e
 yesterday I-Erg park in one deer.MSg and one duck.FSg see-Perf.FSg/see-Perf.MPI
 'Yesterday I saw a deer and a duck in the park.'
 (xvii) kal maiM-ne park meiM hiran aur batak dekhi-e/dekhi-ii
 yesterday I-Erg park in deer.MSg and duck.FSg see-Perf.MPI/see-Perf.FSg
 'Yesterday I saw a deer and a duck in the park.'

the object arguments too. Hence Bhatt & Walkow's account is not generalizable to head final Tsez in explaining the conjunct agreement facts. Under their account only CCA should be possible with the object arguments, FA should not be possible. Although Bhatt & Walkow (2010) focus on Hindi only in providing an account for the conjunct agreement, but an account that is generalizable across languages is to be preferred over an account that can only explain the facts in one language.

Moroccan Arabic data mentioned above also present a couple of problems for Bhatt & Walkow's account. Recall that in Moroccan Arabic, the verbs show CCA as well as FA in the VS order, but they only show FA in the SV order. However, getting FA is expected here under their account since here the agreement takes place with the subject argument, not with the object argument. Note the subject argument gets its case assigned by the T head only, thus T has access to all its features, since T has access to the features of the &P, T can show resolved agreement (FA) in this language. However in this case it is not clear why CCA takes place here. In Bhatt & Walkow's account, CCA was the result of dissociated agreement, the agreeing head not having access to the features of the &P. Here the agreeing head has access to &P's features as is evident from the presence of the FA. To explain these facts, they would need to make stipulations to somehow block access to the &P's features just in constructions where we observe CCA, but not in constructions where FA is observed. Also even after this stipulation, their account faces a problem. Even if CCA is allowed, it still needs to be explained why it is only allowed in the VS order but not in the SV order. It seems that they would need to stipulate that in the VS order, the features of &P can sometimes be blocked even for subject arguments which results in CCA, but in the SV order, the features of the &P cannot be blocked. But such a stipulation does not seem to

have any intuitive bases.

Based on these problems, we can see that Bhatt & Walkow's account does not explain the Hindi and Tsez agreement facts, and also it is not generalizable to other languages. However as I mentioned above, I will use a modified version of their formalization for the linear proximity in the account I propose below in section 4.3.

Marušič, Nevins & Badecker (2010)

Marušič et al (2010), following Munn (1993) among others, take the coordinated phrase to be a Boolean Phrase (BoolP), its structure is similar to the spec-head structure of coordination mentioned above. They assume that the conjunction head is a function that requires inspecting the ϕ -features of both its arguments (i.e. both the conjuncts). The BoolP has resolved number feature in Slovenian, the gender feature is not computed under resolution. They follow the two-step approach to agreement (as in Robinson 2008, BBP 2009), thus the establishment of the Agree relation occurs in the syntax but the actual copying of features takes place at a later stage. They call the two steps *Agree-Establishment* and *Agree-Copying* respectively. They argue that a predicate can agree with either the whole BoolP or the closest conjunct or even with the highest conjunct in some grammars. The difference between agreeing with the highest conjunct and the closest conjunct lies in whether *Agree-Copying* takes place before or after linearization. The internal structure of coordination is not available after linearization, thus at that stage only agreement with the closest conjunct is possible when the verb probes for the most accessible conjunct. They suggest that the speakers follow three different agreement strategies: (i) the agreement targets the BoolP first and only this phrase, (ii) the agreement targets the BoolP first

and then a conjunct, and (iii) the agreement goes straight for a conjunct. There are three constraints and depending on how they are ranked, one of these three agreement strategies is chosen. The constraints are: SAME TARGET (which requires that there is a single probe for number and gender, rather than a split probe), PROBE-HIERARCHICALLY (which requires that the maximal projection BoolP is probed rather than any material inside), and NO DEFAULT (which requires that the default value of a feature is not chosen, instead the probe gets its features valued by an actual goal's features). When the probe establishes *Agree* with the BoolP, it attempts to copy both number and gender features of the BoolP. If there is a single probe for the number and gender (i.e. SAME TARGET is ranked higher), then the number feature is copied from the BoolP and for gender feature the default value is assigned (agreement strategy (i) above). However if there are split probes for number and gender, then after the number feature is valued by the BoolP, the gender feature can be valued by the most accessible conjunct, which could be either the highest conjunct or the closest conjunct (agreement strategy (ii) above). According to Marušič et al (2010), there is true optionality here with respect to choosing the hierarchical or linear most accessible conjunct. In this case the grammatical strategy exhibits the pressure of a constraint NO DEFAULT, as a result of which the gender probe persists into the internal structure of the BoolP. If this happens before linearization, the probe shows gender agreement with the highest conjunct. If this happens after linearization, the probe shows the gender feature of the closest conjunct. In the last strategy (iii), the constraint SAME TARGET and NO DEFAULT result in a single probe for both number and gender features looking inside the BoolP for a conjunct. Again here too, if the copying takes place before linearization, we see agreement with the highest conjunct. If copying takes place after linearization, we see closest

conjunct agreement. To summarize their analysis, the following ranking of constraints corresponds with the three agreement strategies mentioned above .

(81) Agreement strategy (i) : SAME TARGET, PROBE-HIERARCHICALLY >> NO DEFAULT

Agreement strategy (ii) : NO DEFAULT, PROBE-HIERARCHICALLY >> SAME TARGET

Agreement strategy (iii) : SAME TARGET, NO DEFAULT >> PROBE-HIERARCHICALLY

For Slovenian data, they also suggest the Consistency Principle which states that partial agreement converges only when the agreement value registered by the targeted conjunct matches the number value of the verb which it acquired from the BoolP as a whole. Thus the targeted conjunct cannot be singular.

Their analysis can be taken to account for the FA and the CCA patterns observed in Hindi too. However for Hindi, the strategy (ii) does not seem to be available. Hindi does not show resolved number feature and the closest conjunct's gender feature, either we see resolved agreement (for number and default/resolved agreement for gender, i.e. FA) or we see both number and gender features of the closest conjunct. There does not seem to be any need to assume an additional Consistency Principle as the missing agreement strategy (ii) itself accounts for it.

Marušič et al (2010) mention that there is true optionality with respect to choosing the hierarchical most accessible conjunct (if it happens before linearization) or linear most accessible conjunct (if it happens after linearization), however that does not seem to be the case for each language. We do not find partial agreement with the highest conjunct in Hindi which

suggests that in Hindi the Agreement copying takes place after the linearization only under this analysis.

Also, however, the three strategies seem to cover the agreement options observed in the languages mentioned, it is not clear how within the same language two or more options are available. Since the strategies are linked to the rankings of the three constraints (as mentioned in (81) above), to get FA vs CCA within the same language, it seems that we would need to assume different rankings for different constructions, however, generally in optimality theoretic accounts, the rankings are generalized over languages rather than within the same language over constructions. Let's consider an example from Moroccan Arabic. As mentioned above, it shows FA only in SV order, but both FA and CCA are possible in the VS order. Since in Arabic, the agreement can be Sg, it seems that the strategy (ii) is not chosen. But among the rest of two strategies mentioned above, in the SV order, the speakers can choose only strategy (i), but in the VS order sometimes they choose strategy (i), i.e. they apply the ranking SAME TARGET, PROBE-HIERARCHICALLY >> NO DEFAULT, and sometimes they choose strategy (iii), i.e. they apply the ranking SAME TARGET, NO DEFAULT >> PROBE-HIERARCHICALLY. However there does not seem to be any principled explanation as to why one or the other strategy is chosen.

Moreover, to explain the mixed agreement Lebanese Arabic data mentioned above, we would need to assume that the speakers choose both these strategies even within the same construction. In mixed agreement constructions, the preceding auxiliary shows CCA (First Conjunct Agreement), hence it seems that the speakers would use strategy (iii), but since the following adjective shows FA, speakers would have to choose strategy (i) within the same

construction. Also this analysis does not say anything about the adjacency requirements of some languages for CCA, such as Tsez mentioned above.

To summarize, in this section I presented a range of phrasal coordination accounts for the CCA and FA patterns. We see that all of these accounts assume an asymmetrical structure of coordination where one of the conjuncts is higher than the other conjuncts. Most of the accounts make use of this hierarchical asymmetry to account for the CCA, mainly First Conjunct Agreement. However a few accounts also attempt to explain the CCA in both directions (i.e. First Conjunct Agreement as well as Last Conjunct Agreement). However some, e.g. Bošković (2009, 2010), make use of hierarchical structure only to account for Last Conjunct Agreement as well, while others, such as Marušič et al (2007) use a linear relation for the Last Conjunct Agreement, however they differentiate between the CCA going in the two directions. As mentioned above, most of these accounts face problems with respect to one or more of the above mentioned facts, namely, presence of both First Conjunct Agreement and Last Conjunct Agreement in head final Hindi, the adjacency vs proximity requirement of languages with respect to CCA, languages showing both FA and CCA in one word order (VS) but only FA in the other order (SV), mixed agreement with one probe showing CCA while the other showing FA, etc. Below I present a proposal which seems to resolve most of the problems mentioned thus far as well as explain the data from the languages used in the above mentioned accounts and the head final Hindi.⁹⁴

⁹⁴ In this section, I have not discussed the analysis proposed in BBP (2009) and B&B (2010) as the elements of the analysis proposed therein are presented and further developed in section 4.3 below.

4.3. CCA as a Result of Phrasal Coordination with Agree in Syntax and Influences from PF: A Compositional View of Agreement

Most of the above phrasal coordination analyses were based on the data from head initial languages, and in head initial languages, the VS order and the structural left to right asymmetry of coordination yield an outcome such that the verb c-commands the leftmost conjunct and is also linearly adjacent to it, and we see CCA with the leftmost conjunct. But in head final languages such as Hindi, as I argued in chapter 3 above, coordination is head initial with the specifier/prominent conjunct on the left but the verb is usually final (within the VP and the clause) and we see CCA with the last conjunct. So the CCA from head final languages seems to question the role of structure of coordination in CCA suggested in previous analyses which were based on head initial languages, and imply some role of linear proximity. Although note that some of the head initial languages also seemed to show Last Conjunct Agreement as well in the above analyses, for example head initial Slovene. Thus the empirical data with respect to CCA in the two types of languages (head initial as well as head final) and the data involving both the First Conjunct Agreement and the Last Conjunct Agreement within the same language raise the following questions. First, does the structure of coordination play any role in CCA? Second, to what extent is the syntactic configuration relevant to the computation of CCA? Third, what is the role of linear proximity in CCA? All these questions have wider implications for the analysis of agreement and the relation between syntax and the morpho-phonological component. In this section, I attempt to address these questions. The brief answers are as follows. Although for Hindi, the structure of coordination does not seem to play any role in the CCA, it seems that some languages may make use of that, e.g. Slovene (as mentioned in Marušič et al 2007 and

Marušič et al 2010). The syntactic configuration of agreement plays a significant role in the CCA and FA. The linear proximity also seems to be an important factor in CCA in many languages including Hindi, also see BBP (2009) for Tsez.

This section is organized as follows. In section 4.3.1, I present the agreement facts (from two unrelated head final languages Hindi and Tsez) on which the analysis proposed in BBP (2009) and B&B (2010) was based and present the analysis proposed therein which makes use of the syntax as well as the PF component of grammar to provide us with the CCA and FA options in the context of coordination. In section 4.3.2, I revise this analysis based on further data from agreement with the coordinated subject on different types of verbs. In section 4.3.3, I provide an interim summary detailing the elements of the proposal with a few additions. In section 4.3.4, I show how this account explains various facts about CCA and FA, for example the empirical problems faced by the previous phrasal accounts mentioned in section 4.2 above. Then I apply this account to the Long Distance Agreement in the context of coordination in section 4.3.5.

4.3.1. *The agreement facts in the context of coordination in Hindi and Tsez and the Agree + Linear Proximity/Adjacency analysis based on these facts*⁹⁵:

In most of the accounts mentioned in section 4.2 above, CCA was considered the result of a structural relation (e.g. Agree) between the probe and the closest conjunct or its features—specifically, due to the fact that the closest conjunct was also the highest conjunct and thus structurally closer to the probe than the other conjuncts.⁹⁶

95 The data as well as the analysis used in this section is from BBP 2009, and Benmamoun & Bhatia 2010.

96 Except for Bhatt & Walkow (2010), Marušič et al (2007) and Marušič et al (2010) who also mention the role of linear order/ linear proximity.

As mentioned above, in head final Hindi and Tsez, the verb can agree with the rightmost conjunct, as in (42a) above, copied here as (82a) for Hindi, also see (82b) for Tsez borrowed from BBP (2009). Thus, following the argumentation in the above accounts, this data would suggest that the last conjunct must be higher than the first conjunct in these languages as agreement is with the last conjunct.

(82) (a) maiM-ne ek chaataa aur ek **saaRii** khariid-ii (Hindi)
 I-Erg an umbrella.MSg and a saaree.FSg buy-Perf.FSg
 'I bought an umbrella and a saree.' (Kachru 1980: 147)

(b) kid-no **uži-n** Ø-ik'i-s (Tsez)
 girl.II-and boy.I-and I-went
 'A girl and a boy went.' (BBP 2009)

However as I argued in chapter 3 for Hindi, also see BBP (2009) for Hindi and Tsez, the first conjunct is structurally higher/more prominent than the last conjunct in these languages too, just like head initial languages. Thus in these languages too, the probe should be expected to agree with the first conjunct, not with the last conjunct.

In short, while Hindi and Tsez pattern with head initial languages used in the accounts mentioned above with respect to the structure of coordination (the leftmost conjunct is structurally higher than the other conjunct), they differ from head initial languages in that instead of agreeing with the leftmost/the highest conjunct only, they can agree with the rightmost conjunct. Thus, with respect to these data, we can see that an account based on an asymmetric structure of coordination alone (i.e. establishing agreement relationship with the highest conjunct or its features) would not be able to account for the Last Conjunct Agreement in these languages.

Additionally we see that in both these languages, besides the Last Conjunct

Agreement (82), First Conjunct Agreement is also possible (illustrated in (45) above, copied here as (83a) below for Hindi, and borrowed from BBP (2009) and illustrated in (83b) for Tsez).

- (83) (a) Raam-ne kyaa khariid-aa! us-ne khariid-ii **kursii** (Hindi)
 Ram-Erg what.MSg buy-Perf.MSg he-Erg buy-Perf.FSg chair.FSg
 aur sofa, jo us-e ham-ne manaa ki-yaa thaa
 and sofaa.MSg which he-Dat we-Erg forbid do-Perf.MSg be.Pst.MSg
 'What did Ram buy?! He bought the chair and sofa, which we had forbidden him (to buy)!'

 (b) y-ik'i-s **kid-no** uži-n (Tsez)
 II-went girl.II-and boy.I-and
 'A girl and a boy went.'

Notice that when the verb follows the ConjP and is thus linearly close to the last conjunct, CCA is with the last conjunct (82). On the other hand, when the verb precedes the ConjP (whenever it is pragmatically possible) and is thus linearly close to the first conjunct, CCA is with the first conjunct (83). This clearly implicates linear proximity/adjacency in the choice of conjunct for participation in CCA.

However, linear proximity/adjacency does not obviate the role of Agree, the syntactic relation of Agree still is a prerequisite for CCA. This is easily evident from the fact that CCA is always with a member of a phrase that the verb can in principle enter into an agreement relation with. To see this, consider the following sentences in Hindi given in (84). Recall that in Hindi the verb (or the V+Asp+T complex) agrees with the highest absolutive argument. In (84a), the coordinated phrase *sofe aur kursii* is the highest absolutive argument (the subject *raam-ne* is ergative-marked). Hence CCA can take place with a member of this coordinated phrase under linear proximity/adjacency. However, ergative subjects in Hindi only appear in the perfective; if

the verb is non-perfective, as in (84b), the subject appears in the unmarked (absolutive/nominative) form. Thus, in (84b), the subject *raam* is the highest absolutive argument, and thus agreement can only take place with it, even if the object is clearly more proximate to the verb—the object in this non-perfective construction never triggers agreement.

- (84) (a) *raam-ne sofe aur kursii khariid-ii* (Hindi)
 Ram-Erg sofa.Abs.MPl and chair.Abs.FSg buy-Perf.FSg
 'Ram bought sofas and a chair.'
- (b) **raam sofe aur kursii khariid-egii*
 Ram sofa.Abs.MPl and chair.Abs.FSg buy-Fut.FSg
 'Ram will buy sofas and a chair.'

Based on these facts, we suggested in BBP (2009) and B&B (2010) that both Agree and linear proximity/adjacency are necessary for a proper analysis of CCA. Agree establishes a relation between the verb and the coordinated phrase, i.e. it isolates the phrase that the verb can agree with. Linear proximity/adjacency makes the closest conjunct in this phrase the most accessible member of coordination. Thus Agree targets the ConjP but at the point of agreement spell-out, linear proximity/adjacency plays a role in determining what member of the ConjP can spell-out the agreement features by favoring the closest conjunct.

The relation Agree takes place in the syntactic component. The agreement features are spelled out in the PF component. FA takes place if the verb shows features as a result of resolution of the whole coordinated phrase. CCA takes place if the verb shows features of the conjunct (within the phrase with which Agree was established in syntax) that is linearly closer to it in the PF.⁹⁷ CCA is an optional process in the sense that not all speakers use it, and even the

⁹⁷ Considering the assumption that the grammar does not allow complete optionality, it is likely that there are certain differences in, say semantics or prosody etc, between the FA and the CCA, however, I leave this issue for further research.

speakers that employ it do not do so each time agreement takes place. In other words, it is not a stable process, which can be taken to indicate that it is not subject to rigid syntactic conditions but rather to purely linear order and prosodic factors.

Let's look at the derivation in head final Hindi and Tsez, and also in head initial Arabic. We may assume that linearly, in the S(O)V order, both ConjP and NP₂ are close to the T(+V) head and thus can help spell-out the agreement features; in Hindi and Tsez, both are used. CCA in Moroccan Arabic and Lebanese Arabic clauses with VS order can be explained in the same way by recognizing that in such clauses it is the leftmost conjunct that is adjacent to the preceding agreeing head, while in Hindi and Tsez, in the SV order it is the rightmost conjunct that is adjacent to the following agreeing head. Agreement takes place in two stages: Agree establishes the relation with the ConjP agreement controller in syntax, and in PF, proximity/adjacency may give privilege to the most adjacent conjunct NP for spelling-out the agreement features. This compositional view of agreement allows for variation as it is possible that one of the two components (where agreement is established and verified) may be at odds with the other in terms of a particular feature. Contrary to the recent proposals, as mentioned above, which try to develop syntactic mechanisms such that one of the conjuncts (the agreed-with conjunct) is singled out for agreement in the syntactic component, the proposal here does not assume that Agree takes place with the structurally closest conjunct, instead the syntactic relation of agreement is established with the whole coordinated phrase.

The data from the First Conjunct Agreement (82) as well as Last Conjunct Agreement (83), in both Hindi and Tsez, suggests that the relative hierarchical relations between the conjuncts are not relevant for the CCA in these languages, unless we make stipulations that the

On the other hand, in Hindi strict adjacency with the closest member of the coordinated phrase is not required—instead, linear proximity is sufficient for CCA. As shown in (86), intervening material (an adpositional phrase in this example) can separate the verb and the leftmost conjunct, and First Conjunct Agreement can still take place.⁹⁸

- (86) (a) raam-ne khariid-ii (us dukaan-se) ek saaRii aur kuch kurte
 Ram-Erg buy-Perf.FSg (that shop-from) a saree.Abs.FSg and a few kurta.Abs.MPI
 'Ram bought (from that shop) a saree and a few kurtas.' (BBP 2009)

Similar situation is obtained in the context of Last Conjunct Agreement, when the verb follows the coordinated phrase. In Tsez, Last Conjunct Agreement is not possible if another element intervenes between the verb and the coordinated phrase (87b), whereas Hindi allows intervening material (88a). The weight of the intervening material may influence whether we get CCA or not. In (88a), the intervener is a short adjunct, and CCA is possible, on the other hand, in (88b), the intervener is much longer and CCA tends to be blocked. The sensitivity of the CCA to the weight of the intervening material may suggest the effect of processing here.⁹⁹

- (87) (a) uži-n **kid-no** y-ik'is (Tsez)
 boy.Abs.I-and girl.Abs.II-and II-went
 'A boy and a girl went.' (BBP 2009)
- (b) *uži-n **kid-no** iduyor y-ik'is
 boy.Abs.I-and girl.Abs.II-and home II-went
 ('A boy and a girl went home.') (BBP 2009)
- (88) (a) raam-ne kuch kurte aur ek saaRii (us dukaan-se) khariid-ii (Hindi)
 Ram-Erg few kurta.Abs.MPI and a saree.Abs.FSg (that shop-from) buy-Perf.FSg

98 However, it should be noted that the CCA becomes less and less likely as more material intervenes. Also there seems to be variation across speakers in this domain, with some speakers not allowing any intervening material at all, just like in Tsez.

99 The interaction between the CCA and the intervening material needs to be tested experimentally, which I leave as an issue for future research. However a survey with a few native speakers seems to support the generalization mentioned here about the weight of the intervener and the possibility of CCA.

'Ram bought a few kurtas and a sari (from that shop).' (BBP 2009)

(b) raam-ne kuch kurte aur ek saaRii us laRke-ke
 Ram-Erg few kurta.Abs.MPI and a saree.Abs.FSg that boy-Gen
 daadaa-ke dost-kii dukaan-se khariid-e/*?khariid-ii
 grandfather-Gen friend- Gen shop-from buy-Perf.MPI/*?buy-Perf.FSg
 'Ram bought a few kurtas and a sari from that boy's grandfather's friend's shop.'

Thus we see that various languages may differ in terms of the level of adjacency that they require for CCA to take place. However, I would like to add here, as was also hypothesized in BBP (2009) and Benmamoun & Bhatia (2010), both strict linear adjacency and linear proximity are manifestations of the same phenomenon indicative of surface effects in agreement.

4.3.2. Revision of the Analysis based on patterns availability with arguments at different positions:

As I mentioned above in section 4.3.1, the Agree+Proximity/Adjacency account (proposed in BBP 2009 and B&B 2010) seems to explain the CCA facts mentioned in section 4.3.1 for head final Hindi and Tsez as well as head initial Arabic. However, this account also cannot readily explain an asymmetry in the context of CCA that involves unaccusative vs unergative verbs in Hindi. An unaccusative verb displays CCA with its subject (89a), but an unergative verb cannot display CCA with its subject, (89b). The predicate establishes Agree with both the subject of the unaccusative in (89a) as well as the subject of the unergative in (89b) in syntax, under the above-mentioned account. At PF also, both the coordinated subjects are linearly proximate to the predicates, but still the unergative predicate does not show CCA.

(89) (a) [kaagaz aur **pattii**] gir rah-ii hai
 paper.MSg and leaf.FSg fall Prog-FSg Pres.Sg

'The paper and the leaf is falling.' *(subject of unaccusative, CCA)*

(b) [**laRkaa aur laRkii**] ro rah-e/*rah-ii haiM/*hai
 boy.MSg and girl.FSg cry Prog-MPI/*FSg Pres.PI/*Sg
 'The boy and the girl are crying.' *(subject of unergative, no CCA)*

Looking at the scenario with the transitive verbs (which were used in the above section as well), we see that the unaccusative subject behaves like a transitive object, (89a) & (90a); and an unergative subject behaves like a transitive subject, (89b) & (90b). Note the transitive verb can display CCA with its object (90a), but it cannot display CCA with its subject (90b).

(90) (a) baccoM-ne [patra aur **kitaabeM**] paRh-iiM
 children-Erg letters.MPl and books.FPl read-Perf.FPl
 'The children read the letters and the books.' *(object of transitive, CCA)*
 (b) kitaab [**laRkaa aur laRkii**] paRh rah-e/*rah-ii haiM/*hai
 book.FSg boy.MSg and girl.FSg read Prog-MPI/*FSg Pres.PI/*Sg
 'The book, the boy and the girl are reading.' *(subject of transitive, no CCA)*

This suggests that the structural position of the coordinated phrase (internal argument vs external argument) may also be relevant for the CCA. We suggest that this asymmetry between (89a, 90a) and (89b, 90b) can be accounted for if the unergative arguments are located in a position higher than the probe, where they are in a spec-head relation with the probe. Thus the position [spec, vP] of the external arguments (unergative subjects, transitive subjects) vs the lower position of the internal arguments (unaccusative subjects, transitive objects, even passive subjects) may be a relevant factor in deciding whether CCA takes place or not.¹⁰⁰ Here I suggest two options to

¹⁰⁰Since both the unergative as well as the unaccusative arguments may move to the [spec, TP] position, the difference in behavior between the unergative and the unaccusative arguments cannot be ascribed to the [spec, TP] position. The reasons why these arguments may move to the [spec, TP] may be EPP (e.g. Davison 1991 suggests that Hindi T has a strong EPP feature and thus all the subjects (irrespective of whether they are transitive or unergative or unaccusative arguments) move to the [spec, TP] position), it may even be Case for the

account for the asymmetry of CCA with respect to the unaccusative vs unergative arguments in Hindi.

One possibility is to assume the spec-head configuration also as a viable configuration for agreement in addition to Agree, following Franck et al (2006), also see Chomsky (1995). Under this option, following Franck et al (2006), we may assume that as a result of the additional spec-head agreement in case of the external arguments, the agreement relation gets strengthened. Note, the coordinated phrase is in [spec, vP] configuration with the v head. This leads to less variability in agreement as then the PF processes cannot influence the agreement, this results in FA. In the case of the internal arguments, however, since spec-head agreement does not take place with the v head, the agreement relation is not strengthened. Hence there is scope for the PF processes to still influence agreement; and when it does influence, we get CCA.

The other possibility is to make use of the prosodic phrasing as proposed in Ackema & Neeleman (2003). Under this option, we may assume an operation that aligns certain syntactic boundaries with certain prosodic boundaries. Thus here, for Hindi, we may assume that the prosodic phrasing treats the internal arguments together with the verb as one unit, whereas the external arguments may not form a prosodic phase with the verb. Thus when agreement features are spelled-out in the PF, the verb (the T and Asp heads in the verbal complex) has access to the internal makeup of the coordinated phrase when it forms a prosodic phrase with it, i.e. when it is the internal argument. But it does not have access to the internal makeup of the coordinated phrase when it does not form a prosodic phrase with it, i.e. when it is the external argument. This difference can lead to the option of CCA with the internal arguments but not with the external

unaccusative argument (it may get the Nom case assigned by the T head in the [spec, TP] position).

arguments.

Here I discuss in detail the first option about an additional spec-head agreement configuration to show how it can explain away the CCA asymmetries, however the prosodic phrasing option can also be seen to work for the same set of data.¹⁰¹ Even though I am discussing the first option in detail here, I emphasize that this is purely for the time reasons rather than favoring it over the prosodic phrasing option. We would need further investigation to test the predictions made by the two options, which I leave aside for the future work.

Let us now discuss in detail the additional spec-head agreement option. Based on the asymmetry in CCA with respect to the unaccusative vs unergative verbs, and following Rizzi (1991), I suggest the following condition which would incorporate the explanation for this asymmetry in Hindi CCA into the account we already have proposed above. The condition for Hindi is stated in (91) below. (92) shows the structures for the unergative and the unaccusative verb constructions.¹⁰²

(91) *The spec-head agreement requirement on head v in Hindi:*

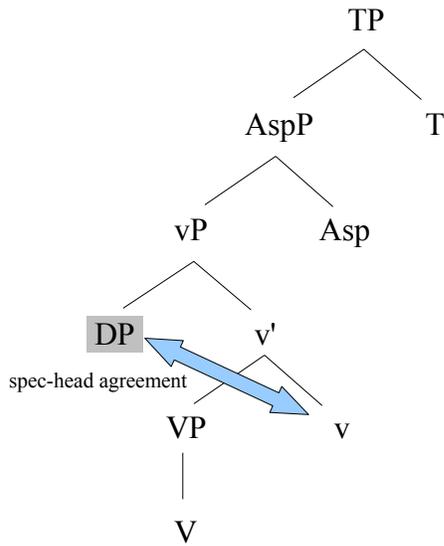
In Hindi, the head v is such that if the [spec, vP] is filled (with a relevant phrase), then spec-head agreement takes place.¹⁰³

101 However, it seems that we may need to make certain stipulations for this option to work for head final Hindi and Tsez as well. Note Tokizaki (1999) makes a generalization about the left-alignment in head final languages for prosodic phrasing. Hence prosodic phrasing of the verb with the coordinated phrase on the left is expected, hence Last Conjunct Agreement may be explainable. However, in Hindi and Tsez, even First Conjunct Agreement is possible, this may present a problem for the prosodic phrasing option unless it can be shown that prosodic phrasing can take place in both the directions. Thus, further investigation would be needed to resolve this issue.

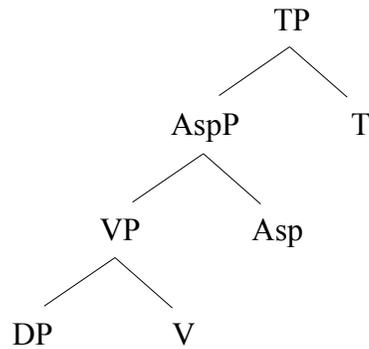
102 The unaccusative construction in (92b) does not show the vP projection, although we may assume that the vP is generated even in the unaccusative constructions, however no argument is base-generated in its specifier.

103 Here by “a relevant phrase” I mean a phrase in its absolutive form rather than an overtly case marked, i.e. non-absolutive form. This is so because a general condition on agreement in Hindi is that the argument with which agreement is to be established be in its absolutive form. See chapter 2 above for details.

(92) (a) *The unergative verb construction*



(b) *The unaccusative verb construction*¹⁰⁴



The derivation in Hindi would then proceed as follows. In syntax, the T head establishes Agree with the highest absolutive argument in the clause. If the [spec, vP] position is filled, i.e. there is an external argument present (as in the case of unergative and transitive verbs), and if the phrase in [spec, vP] is absolutive, then v establishes spec-head agreement with it due to condition in (91). Note since the argument at [spec, vP] is absolutive, the T head also has established Agree with it as that is the highest (absolutive) argument in the clause. As a result of the spec-head relation, the agreement established through Agree with the external argument gets strengthened. Hence the PF conditions such as linear proximity/adjacency cannot influence the agreement, thus the agreement is spelled out as the resolved agreement on the whole coordinated phrase, thus we see FA with the external arguments.

If, on the other hand, either the argument at [spec, vP] is non-absolutive (as in the case of transitive verbs with, say, ergative subjects) or the [spec, vP] is not filled (as in the case of unaccusative verbs), only T establishes Agree in syntax with the relevant goal, the absolutive

¹⁰⁴Note that even if v head is assumed to be present with the unaccusative verb constructions, it is not the same head as in case of the unergative verbs, it would be taken as a defective head in that case.

internal argument. Since spec-head relation is not established at the vP, the agreement relation between the probe and the goal is not strengthened the way it is with the external arguments. Hence in PF, linear proximity/adjacency condition may look inside the coordinated phrase as well and choose the linearly closest conjunct within the phrase with which Agree is established. This results in CCA. If instead the features of the whole coordinated phrase only are chosen (say for some pragmatic reasons), then FA obtains.

The condition in (91) here may seem like a stipulation, but it does not just provide us with an advantage in Hindi in explaining the CCA asymmetry with respect to the unaccusative vs unergative verbs, such a condition is generalizable to other languages as well and hence is more advantageous. For example, when generalized, it provides us with an advantage in explaining the CCA asymmetry with respect to the word order in Arabic. Hence I modify the condition given in (91) above to make it more general, see (93) below.

(93) *The spec-head agreement requirement on specific heads in languages:*¹⁰⁵

For some languages, there is a specific head X such that if the [spec, XP] position is filled, then spec-head agreement takes place.

Looking at the facts in specific languages, we can determine if such a head is present in a language and if it is present, then which head it is. As seen above, the unaccusative vs unergative CCA asymmetry suggests that for Hindi, it is the head v. The word order asymmetry with respect to CCA in Arabic suggests that T is the relevant head in Arabic. Note that in the SV order in Arabic, only FA is possible, whereas in the VS order, the FA as well as CCA is possible. In relation to the condition in (93) above, we can assume that in the SV order, the coordinated subject is in [spec, TP] position and thus spec-head agreement also takes place between the T

¹⁰⁵It may be the EPP feature on the relevant heads or some other feature which requires that the position be filled and the spec-head agreement take place if possible.

head and the coordinated subject in its specifier position in addition to the Agree relation.¹⁰⁶ This strengthens the agreement relation between the probe and the goal, the coordinated phrase. As a result of this, the features of the whole coordinated phrase are spelled-out at PF, the PF processes cannot change it. In the VS order, when the coordinated subject is not in [spec, TP], only Agree takes place, the agreement relation is not strengthened the same way, hence possibility of CCA also is there besides FA.^{107 108}

In Hindi, we cannot assume that both *v* and *T* are such heads as in Hindi we do not see such effects of spec-head agreement with the *T* head. Note the unaccusative subject may be in the [spec, TP] position in the SV order, but still CCA with the subject is possible. Since Tsez does not show any of the asymmetries mentioned here, we may assume that in Tsez, there is no such head which requires spec-head agreement (or at least *v* and *T* are not such heads in Tsez).

In fact support for such an analysis can be drawn from English which does not show CCA normally. If we assume that *T* is such a head in English, then in the SV order, we should not expect to see CCA (as the coordinated subject would be in [spec, TP] position, leading to spec-head agreement, strengthening the agreement relation and bleeding the effects of PF

106Some previous analyses of agreement also considered the spec-head relation to result in the FA, and allowed both FA and the CCA in the other configurations, e.g. government. The analysis proposed here has obviously borrowed intuitions etc from the previous work, thus the similarities are expected. However as I had mentioned the problems with the specific details of these analyses in section 4.3.1 above, this proposal is an attempt to explain the presence of the two agreement patterns without having to face those problems, also the main thesis in this proposal is to reinforce the idea that agreement is not a purely syntactic phenomenon, the PF component also plays a role in how the agreement relation established in the syntax can be spelled out, and at the same time the syntax may reinforce the relations in such a way that certain PF conditions may not apply and hence may limit the variability in the agreement forms.

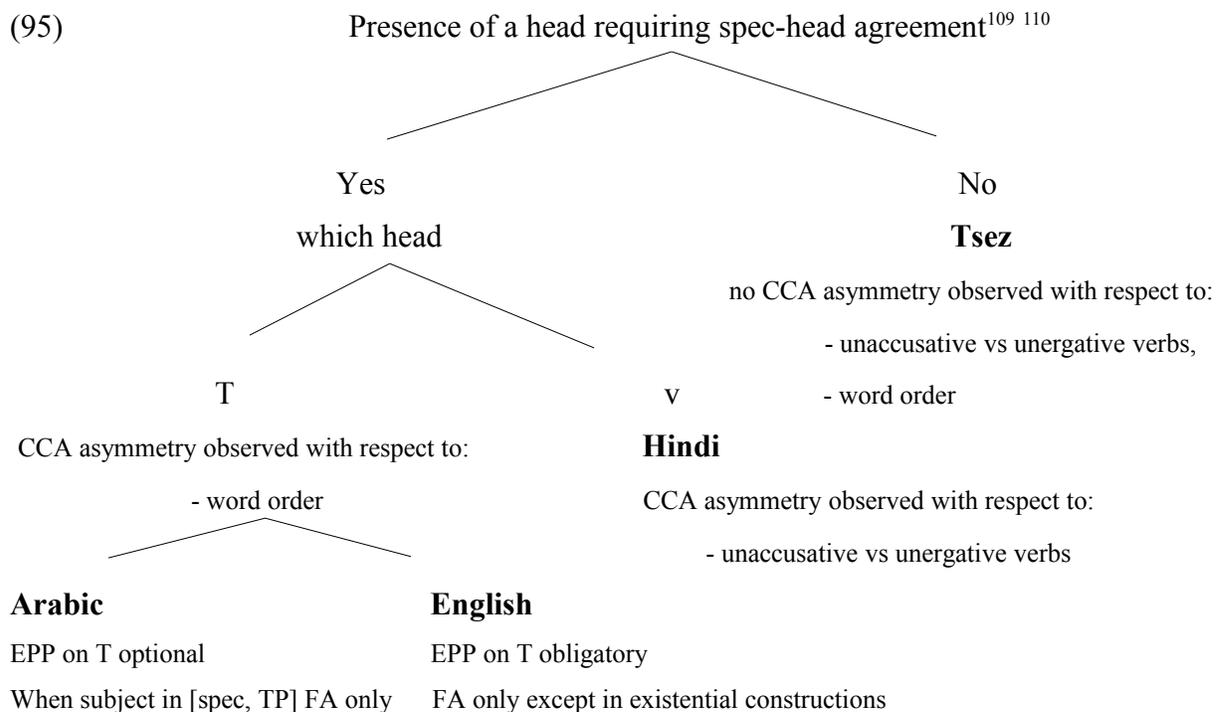
107Note in certain cases the coordinated subject may be in [spec, TP], but further movement of the verb may still result in the surface VS order. In such cases, we expect to get the FA only.

108Note that under the prosodic phrasing option mentioned above, this asymmetry may be explained by assuming that the verb forms a prosodic unit with the subject on its right (note Tokizaki's (1999) generalization about Right-alignment in head initial languages as mentioned in Ackema & Nelleman 2003). Hence in the VS order, it forms a prosodic unit with the coordinated subject, hence the internal makeup of the coordinated subject is available to the verb, which allows for the possibility of CAC in the PF component. In the SV order, on the other hand, the *V* does not form a prosodic phrase together with the coordinated subject on its left, hence CCA is not an option, only FA is observed.

conditions on agreement), and this is indeed found to be the case in English, we only see FA there. The difference between English and Arabic is that in English, the T head always has the EPP feature, as a result of which the subjects move to the [spec, TP] position. In Arabic, this is not the case (see Soltan 2006, 2007 where he mentions that the T head may or may not have the EPP feature). When the T head has an EPP feature, the subjects move to [spec, TP] position or are base-generated there, but T head may also appear without the EPP feature, in that case, the subject does not move to the [spec, TP] position. We can, in fact, see CCA in English also when the [spec, TP] position is filled by an existential, thus the coordinated subject is not in the [spec, TP] position, see (94) below. Note that the verb shows singular number feature of the closest conjunct rather than FA.

(94) There remains one package and two letters in the bag. (Shields 2003)

The explanation for CCA facts in these four languages (Hindi, Tsez, Arabic, and English) as provided above can be summarized as follows.



Thus I assume that Agree is established in syntax in all four types of languages above. The difference between Hindi/Arabic/English on the one hand and Tsez, on the other, is whether there is such a head in the language that requires spec-head agreement or not. When the spec-head agreement takes place, the agreement relation with the whole coordinated phrase gets strengthened, hence PF conditions cannot influence it and we see FA only. The difference between Hindi on the one hand and Arabic/English on the other is whether the v head or the T head requires spec-head agreement. The difference between English and Arabic is that the T head always has EPP feature in English and in Arabic, it is optional. Thus, since the subject is always in [spec, TP] in English (except for the existential constructions), we see FA only. In Arabic, depending on whether the subject is in [spec, TP] or not, we get just FA or both FA and

¹⁰⁹As mentioned above, this requirement for the spec-head agreement may be seen in terms of an EPP feature on the relevant head or some other similar feature on the head.

¹¹⁰Also note that this account does not contradict the role of PF conditions of linear adjacency/proximity, instead it just shows that the syntax may limit the cases in which the PF conditions of linear adjacency/proximity may apply.

CCA.

Thus, the point to be focused in this section is that when during the derivation a spec-head relation has been established in addition to the Agree relation with the goal, the agreement relation gets strengthened (as Franck et al 2006 suggest), this leads to less variability in agreement as then the PF processes cannot change it, only FA is observed. If, however, only Agree relation has been established, then the agreement relation has not been strengthened the way it is in case of external arguments (through spec-head relation), the PF processes can influence and proximity/adjacency effects can be observed, i.e. CCA is possible. Thus we see that, under the Agree+Proximity/Adjacency account itself, we can explain how the predicate can show CCA with the internal arguments but not with the external arguments in Hindi. Also among other facts, this analysis can explain why in Arabic post-verbal subjects display CCA but not pre-verbal subjects. In Hindi the unaccusative vs unergative distinction arises due to the fact that the *v* is such a head that requires spec-head agreement in Hindi. In Arabic, T is such a head, this explains why we see CCA only when the argument appears lower than the T head (as in the VS order). In the SV order, since the coordinated phrase is in spec-head relation with the T head, syntactic agreement relation is strengthened, hence only FA is observed in the SV order.

In summary, in this section, I revised the Agree+Proximity/Adjacency analysis proposed in BBP (2009) and Benmamoun & Bhatia (2010) to incorporate the additional facts from Hindi with respect to the asymmetry between the internal and external arguments, by adding the spec-head configuration also as a viable agreement configuration. This also accounts for CCA in other languages such as head initial Arabic (the account incorporates the data related to the word order asymmetry observed in Arabic with respect to the CCA).

4.3.3. *Elements of the Revised Analysis for CCA and FA: An interim summary, and a few additions*

In this section, I describe all the elements, assumptions etc that make part of the revised analysis to account for the CCA and FA patterns, some of which are previously mentioned and some are new.

1. *The relation Agree*: The T head establishes Agree in syntax with an appropriate goal within its c-command domain. In Hindi, for example, it is the highest absolutive argument that the T head establishes Agree with. For Hindi, as mentioned above in chapter 2, following Bhatt (2005), it is assumed that the T head establishes a covaluation relation with all the intervening heads on its way probing down. When the T head's features are valued by the features of the goal, due to covaluation relation, the intervening heads also get their features valued with the same goal's features. This explains why all the agreeing heads appear to show agreement features of the same goal only, for example the participle as well as all the auxiliaries show agreement features of the same element.

Note, as I mentioned above too, the syntactic relation of Agree is required and it is evident from the fact that CCA is always with a member of a phrase that the verb can in principle enter into an agreement relation with, see discussion around (84) above. What the relation Agree does is that it isolates the phrase (“the goal”) that the verb can agree with, i.e. it identifies the search domain for features at PF.

In case, the non-coordinated phrase is the highest absolutive argument, this argument is the search domain for spelling out the agreement features on the verb (/verbal complex). Thus the verb has access to this non-coordinated phrase' features at the PF. The verb uses the features

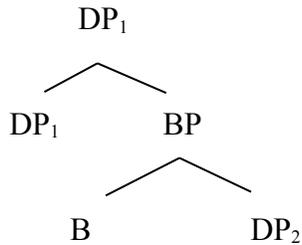
of this phrase to spell-out its agreement features. When the coordinated phrase is the highest absolutive argument, again this argument is the search domain within which the verb can get its features. This time, however, instead of there being just one set of features to select, there are three sets of features (when the coordinated phrase consists of two conjuncts) to choose from: the features of the whole coordinated phrase (resolved features), the features of the first conjunct, and the features of the last conjunct. When the verb selects the whole coordinated phrase to spell-out its features, we get FA. When, as a result of PF conditions such as linear proximity, the verb selects the first conjunct (note the first conjunct is within the search domain for spelling-out the agreement features), we see features of this conjunct on the verb, hence First Conjunct Agreement. When, again as a result of PF conditions such as linear proximity, the verb selects the last conjunct (which is also in the search domain established in the syntax by Agree), we see features of the last conjunct on the verb, hence Last Conjunct Agreement.

2. *The coordinated phrase (&P)¹¹¹*: As I discussed in chapter 3 above, the coordinated phrase in Hindi has an asymmetric head initial structure where the first conjunct is higher than the second conjunct. This is also found to be true for head final Tsez (see BBP 2009). However, as mentioned above too, there are two possible structures (96a-b), and it is not critical for the analysis proposed here which of these structures is assumed.

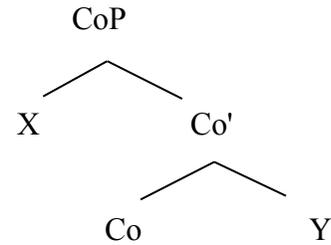
¹¹¹The “&P” or “CoP” or “ConjP” all are used interchangeably to refer to the coordinated phrase.

(96) Head initial structure of coordination

(a) “**Boolean Phrase structure**”



(b) “**spec-head structure**”



3. *The strategies for accessing the features*: The Hindi data we studied seem to provide us with two options: either the features of the whole coordinated phrase are accessed or the features of the linearly closest conjunct are accessed. However Marušič et al (2010) showed that features of the hierarchically closest conjunct can also be accessed in Slovene. Thus accepting the hierarchical option as well from them, I also assume that there are three strategies to access the features from the search space determined by the relation Agree. The three strategies Marušič et al (2010) mention are as in (97) below.

(97) Three strategies for accessing the features

- (a) Maximal-Projectionly: The agreeing head (say verb) targets the whole coordinated phrase at PF, hence the resolved features of the whole coordinated phrase are chosen.
- (b) Hierarchically: The agreeing head targets the highest conjunct, hence the features of the highest conjunct are chosen.
- (c) Linearly: The agreeing head targets the linearly closest conjunct, hence the features of the linearly closest conjunct are chosen.

According to Marušič et al (2010), the difference between the strategy (b) and (c) above is whether the agreeing head targets the conjunct before linearization or after linearization. If it happens before linearization, the internal structure of the coordinated phrase is still available,

hence the highest conjunct is chosen. If it happens after linearization, the internal structure of the coordinated phrase is not available, hence the linearly closest conjunct is chosen, see point 5 below. Hindi does not have the strategy b available to it, hence we do not observe the highest conjunct agreement in Hindi in the context of coordination.

4. *The computation of features of the coordinated phrase/ the resolution rules for Hindi:* The coordinated phrase in Hindi computes the agreement features based on the following resolution rules. The number feature is always resolved to plural irrespective of whether the conjuncts are singular or plural or a combination of singular and plural. If all the conjuncts are masculine or a combination of masculine and feminine, then the gender feature is resolved to masculine. If all the conjuncts are feminine, then the gender feature is resolved to feminine. However in this case masculine feature may also be used (which may be considered the resolved feature value or it may be the default feature value). This is illustrated in (98) below.

(98) The computation of features of the coordinated phrase

(a) **MSg + MSg = MPI**

raajiiv	aur	vijay	der se	pahuMc-e
Rajiv	and	Vijay	late	arrive-Perf.MPI

'Rajiv and Vijay arrived late.'

(b) **FSg + FSg = FPI/ MPI**

siimaa	aur	maalaa	der se	pahuMc-iiM/pahuMc-e
Sima	and	Mala	late	arrive-Perf.FPI/arrive-Perf.MPI

'Sima and Mala arrived late.'

(c) **MSg + FSg= MPI**

raajiiv	aur	maalaa	der se	pahuMc-e
Rajiv	and	Mala	late	arrive-Perf.MPI

'Rajiv and Mala arrived late.'

(d) **FSg + MSg = MPI**

maalaa	aur	raajiv	der se	pahuMc-e
Mala	and	Rajiv	late	arrive-Perf.MPI

'Mala and Rajiv arrived late.'

5. *Linear Proximity/Adjacency*: When the agreeing head targets the conjunct after linearization for spelling out its features in the PF component, as it happens in Hindi and Tsez, the structure of coordination is not available to it, the linear order is available. When the agreeing head traverses through this linear space to choose the closest conjunct for spelling out its features, the linear proximity condition guides its search. The linear proximity condition, borrowed from Bhatt & Walkow (2010) and revised in (78) above, is copied here in (99). As mentioned above, following the linear proximity condition, the agreeing head, in its search for the closest conjunct, settles with the linearly closest conjunct within the phrase with which Agree was established and hence spells-out its features (e.g. Hindi).

(99) **Linear Proximity**:¹¹² Whichever linear relation holds between C and A , T is the unique

ϕ_i such that

(a) ϕ_i is contained in A , and

(b') there is no ϕ_j different from ϕ_i and contained in A such that the same linear relation holds between ϕ_i and ϕ_j as holds between A and C .

[decides the direction of conjunct agreement]

This condition decides that if the coordinated phrase is to the left of the agreeing head, we get Last Conjunct Agreement (rather than agreement with the First Conjunct), and if the coordinated phrase is to the right of the agreeing head, we get First Conjunct Agreement (rather than

¹¹²For convenience sake, the C here refers to the agreement controller (i.e. the probe), the A refers to the anchor (the coordinated phrase here), the T refers to the target (the conjunct whose features end up being expressed on the probe here). Refer to discussion around (86) above for details.

agreement with the Last Conjunct). However, the linear proximity condition is sufficient for Hindi CCA, there are some languages that impose an additional requirement for CCA to obtain the linear adjacency, as happens in Tsez mentioned above. Thus languages, such as Tsez, require a more constrained condition than linear proximity, namely linear adjacency. I state the linear adjacency condition in (100) below, which is basically the linear proximity condition with an additional clause to impose the adjacency requirement.

- (100) **Linear Adjacency:** Whichever linear relation holds between C and A , T is the unique ϕ_i such that
- (a) ϕ_i is contained in A , and
 - (b') there is no ϕ_j different from ϕ_i and contained in A such that the same linear relation holds between ϕ_i and ϕ_j as holds between A and C , and
[decides the direction of conjunct agreement]
 - (c) there is no maximal phrase M such that if $\langle A, C \rangle$ then $\langle A, M \rangle$ and $\langle M, C \rangle$, and if $\langle C, A \rangle$ then $\langle C, M \rangle$ and $\langle M, A \rangle$.
[contributes to the linear adjacency requirement]

6. *The spec-head agreement configuration:* As mentioned in the above section, following Franck et al (2006), another agreement configuration, the spec-head agreement configuration, is also considered a viable agreement configuration in addition to Agree (also Chomsky 1995). As a result of the additional spec-head agreement, the agreement relation gets strengthened. This leads to less variability in agreement as then the PF processes cannot change the agreement, this results in FA. I also assume that through spec-head agreement, the phrasal features (i.e. the resolved features) of the coordinated phrase get reinforced/highlighted/strengthened. In the spec-head configuration, the internal structure/ internal makeup of the coordinated phrase is not visible to the head, only the phrasal features (resolved features) of the coordinated phrase are available to

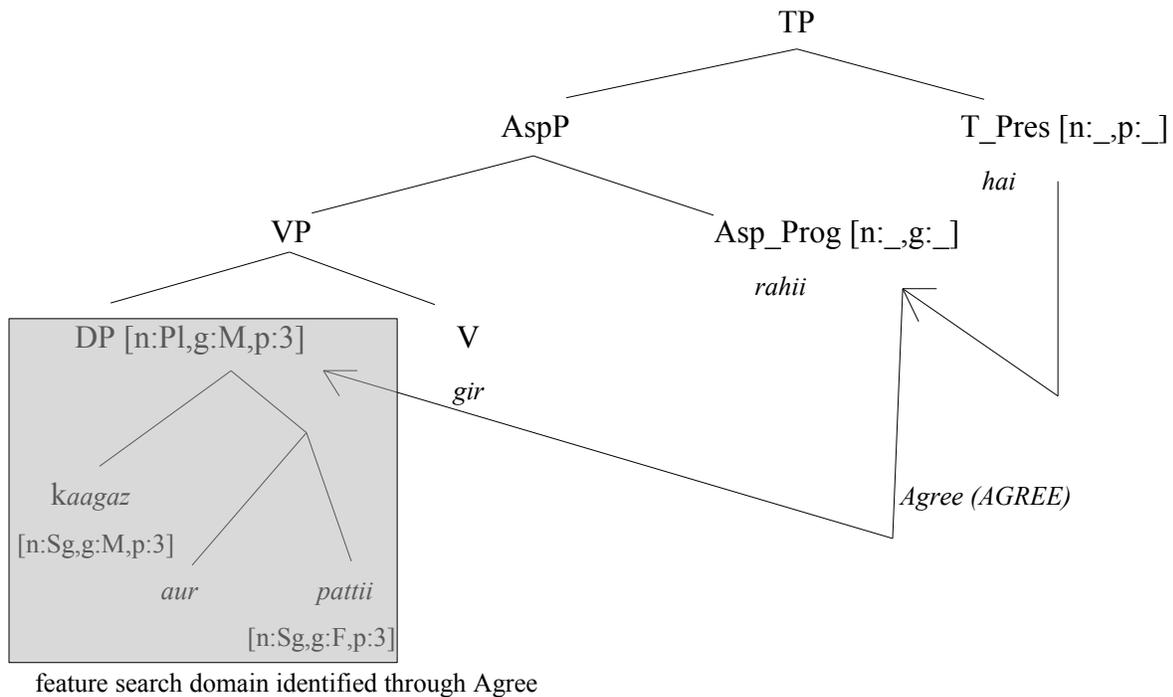
the head and hence spec-head agreement being an additional agreement configuration highlights/strengthens the resolved features (also see Munn's 1999 view about government vs spec-head agreement configuration, also van Koppen's 2008 view about the internal structure being available to Agree but not in spec-head configuration, although for her spec-head does not have internal structure due to movement of the coordinated phrase).

Hence, as a result, at PF, out of the three sets of features (resolved features- that could be available in the search space due to Agree; and the features of the first conjunct, and the features of the last conjunct- that could be available in the search space due to the PF condition of linear proximity), the features reinforced/strengthened due to spec-head agreement (the resolved features) are chosen as the spec-head agreement strengthens the agreement relation in syntax, and hence PF is not permitted to change it. Thus we get FA. When the spec-head agreement has not taken place, then either of the three sets of features are accessible and PF conditions may help in determining which features are chosen. However then also, the pragmatic factors, e.g. expected collective reading from the context, or psycholinguistic factors, e.g. intervening material causing more processing burden on the language users etc, may also result in choosing the resolved features and hence FA.

7. The spec-head agreement requirement on specific heads: Finally, as I mentioned in the previous section, some languages seem to have the spec-head agreement requirement on specific heads. As mentioned above, when spec-head agreement takes place, it reinforces the agreement relation, and the resolved features and hence only FA is observed with the specifier of those heads. The condition, originally stated in (93) above, is copied here as (101) below.

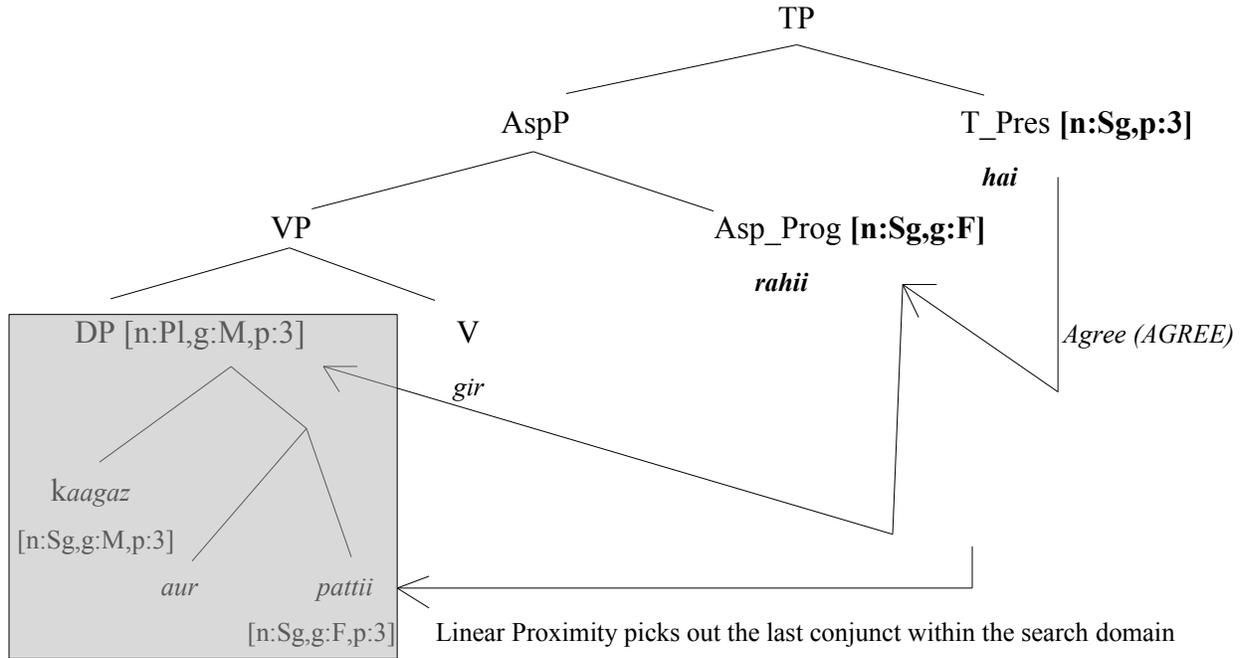
Here, first of all, in the syntax, since the T and the Asp heads have unvalued uninterpretable features, they need to value their features. Thus the T head probes down in its c-command domain, it comes across Asp which also has phi-features, and hence is a relevant goal for T. But since Asp also does not have interpretable features, it cannot value T's features. Thus T establishes a covaluation relation with it and probes further down. It finds the coordinated DP which has interpretable features, which are the result of the application of the resolution rules as mentioned in (98) above. Thus T establishes Agree (i.e. AGREE) with this coordinated DP in syntax. As a result of Agree, the coordinated DP is identified as the search space for the T and the Asp heads to get the features from for spelling out their features. This is illustrated in (102c) below. Note, as a result of Agree, the internal structure of the coordinated DP also becomes accessible to the agreement probes. The features on the T and the Asp probes will be spelled out in the PF component.

(102) (c) T establishes Agree with coordinated DP in syntax



In the PF component, the T head may spell out its features using the features of the whole coordinated DP, in that case the T head would have features [n:Pl,p:3], and the Asp heads features will also be spelled out using the features of the same goal, the coordinated DP, hence the Asp would have features [n:Pl,g:M]. This would result in the FA as in a sentence “*kaagaz aur pattii gir rahe haiM*” ‘The paper and the leaf are falling.’. However, for the sentence in (102a) above, the PF condition of linear proximity applies in picking out the element within the search space for spelling out the features on the probes. Note here no spec-head agreement relation has been established between the coordinated DP and the v head (as it would be if it were an unergative verb construction). Hence, the agreement relation is not strengthened, as mentioned above. Thus the PF conditions, such as linear proximity, may change the agreement. Since the V-Asp-T follows the coordinated DP, as a result of application of the linear proximity condition in (99) above, the last (linearly closest) conjunct is chosen. As a result, the features on the T and Asp heads are spelled out based on the features of the closest conjunct. This is shown in (102d) below.

(102) (d) Feature spell out in PF, the T establishes Agree with coordinated DP in syntax



If the word order had been VS instead of SV, the condition of linear proximity would have chosen the first conjunct for spelling out the features on the agreement probes. Thus we see that the PF condition of linear proximity determines whether First Conjunct Agreement takes place or Last Conjunct Agreement.

Thus we see, under this account the optionality is not in the syntax with respect to whether we get CCA or not. The syntactic relation of Agree always takes place. Similarly spec-head agreement for the relevant heads always takes place (when the specifier position is filled, and in Hindi, for example, the phrase in the specifier of the relevant head v is in absolutive form, e.g. for an unergative verb). Also, in the PF component, whether one set of agreement features is chosen or another also seems to be determined by various pragmatic or psycholinguistic factors. If syntactic agreement is reinforced, PF conditions cannot change agreement, hence PF chooses

to spell out the features of the whole coordinated phrase. Otherwise, the PF conditions may choose one or the other conjunct depending on the word order and hence the proximity with the conjunct in the sentence.

4.3.4. Generalizability of the proposed analysis in accounting for the CCA and FA facts across languages:

The above mentioned account has advantages with respect to explaining a few other phenomena observed in presence of CCA and FA in Hindi as well as across other languages. I discuss a few of them below.

First of all let's consider the possibility of CCA in presence of NSIs. As mentioned above, many languages do not allow CCA in presence of NSIs (e.g. Arabic). In Hindi also, there are a few NSIs which do not appear with CCA but with FA only. These NSIs require a plural antecedent, i.e. they require morphological Pl feature on their antecedent.¹¹⁴ As I mentioned in the previous section, when the resolved features (features of the whole coordinated phrase) are reinforced/strengthened for some reason in the syntax, e.g. due to spec-head agreement, the verb chooses the resolved agreement feature set instead of the features of the first conjunct or the last conjunct for spelling-out its features in the PF. Similarly, in the case of NSIs requiring morphosyntactic plurality, the Pl features (i.e. the resolved agreement features of the whole coordinated phrase) get reinforced/strengthened in syntax/LF.¹¹⁵ As a result, when in PF the verb searches in the search domain established by Agree for the features, it chooses the already

¹¹⁴Note there are other NSIs in Hindi which do not force FA, as I argued above, it may be due to the fact that these NSIs require a semantically plural antecedent but they do not require morphosyntactic plurality, but just matching of features with the antecedent (which may be Sg or Pl).

¹¹⁵When two or more syntactic processes access the features of an element (e.g. the Pl/resolved features of the whole coordinated phrase), the features get strengthened/ reinforced, thus more activated in the PF.

activated features, i.e. the resolved agreement features. Hence we get FA, rather than the CCA in presence of these NSIs. On the other hand, the NSIs which do not require morphosyntactic plurality, but just morphosyntactic matching of features with their antecedant, do not force FA. This is because even in presence of these NSIs, the features of the whole coordinated phrase do not get reinforced/ strengthened in syntax/LF. Hence the resolved feature set is not more activated than the other two feature sets. Hence the language may choose the linear strategy (or the hierarchical strategy) too to select the feature set at the PF for spelling out features on the verb. Thus, e.g. depending on the linear proximity condition, the features of the first or the last conjunct may also be spelled out resulting in CCA in presence of NSIs.

Similarly we can explain the presence of collective reading with FA only, not with CCA, and the presence of distributive reading in both FA and CCA. When in LF/syntax, the coordinated phrase is being treated as a group, its resolved agreement features get reinforced/ strengthened. As a result, at PF these features are more activated than the other two sets of features (i.e. the features of the first conjunct and the features of the last conjunct). This results in the verb picking out the resolved agreement features to spell-out its features. Hence we see FA. In the other scenario, when, say pragmatically, the language user has the distributive reading of the coordinated phrase (in Lasnik's 1995 analysis, when the predicate has a D-operator), the resolved agreement features are not reinforced/strengthened. As a result, at PF the verb may select either of the agreement strategies picking out either the resolved agreement feature set or the features of the first conjunct or the last conjunct. Hence in this scenario, both FA and CCA are possible. This indeed is found to be the observation across languages, both FA and CCA constructions can have distributive readings.

Now let me make a few comments with respect to the empirical observations mentioned as problems for the previous phrasal coordination analyses of CCA (and FA). In Moroccan Arabic, both FCA and FA are possible in the VS order, but in the SV order, FCA is not allowed, only FA is. Also in Hindi, the verbs can show CCA as well as FA with the internal arguments (subjects of unaccusative verbs, objects of transitive verbs), but only FA with the external arguments (subjects of unergative verbs, subjects of transitive verbs). Although these two observations seem unrelated, as I mentioned above, under the present account, they can be understood as two manifestations of the same phenomenon, the spec-head agreement, which results from the spec-head agreement requirement on the T head in Arabic and the v head in Hindi. Just to repeat the argumentation mentioned above, since the spec-head agreement reinforces the resolved agreement features, they are activated at PF. Hence the verb selects the resolved agreement features for spelling out its features, resulting in FA. In Arabic, this happens with the coordinated argument at the [spec, TP] position, and in Hindi, this happens with the coordinated argument at [spec, vP] position.

The First Conjunct Agreement as well as Last Conjunct Agreement in Hindi are the result of application of the Linear Proximity Condition (as stated in (99) above), and in Tsez the result of Linear Adjacency Condition (as stated in (100) above) at PF. As a result of applying the relevant PF conditions mentioned above, Hindi allows intervening material between the coordinated phrase and the agreeing head, whereas Tsez does not allow that.

Similarly the mixed agreement facts in Lebanese Arabic can be explained under this account as follows. The T head establishes Agree in syntax. Thus all three sets of features are accessible to the agreeing head, the verb. At PF, due to linear proximity condition, since the verb

precedes the coordinated phrase, it can choose and spell-out the features of the first conjunct resulting in First Conjunct Agreement. As we move linearly in the sentence from the beginning to the end, by the time we reach the adjective following the coordinated phrase, since the whole coordinated phrase has been pronounced, the features of the whole coordinated phrase may get activated. At this point, the adjective following the coordinated phrase may choose these features resulting in FA.¹¹⁶

Thus we see that this analysis explains the CCA and FA facts across languages, which is a desirable attribute while evaluating an analysis.

4.3.5. *Applying the proposed analysis to Long Distance Agreement in the context of coordination (LDA CCA):*

Long Distance Agreement (LDA) has been defined as the agreement between the verb and constituents inside its complement clause, thus the arguments that the verb agrees with are not its own arguments, they do not belong to the same clause (Bhatt 2005). The following example from Hindi shows an instance of LDA.¹¹⁷ Notice, the matrix verb *chaah* 'want' agrees with *kitaab* 'book' (notice the bold part) that is not an argument within its clause, *kitaab* is an argument in the complement clause of *chaah*.

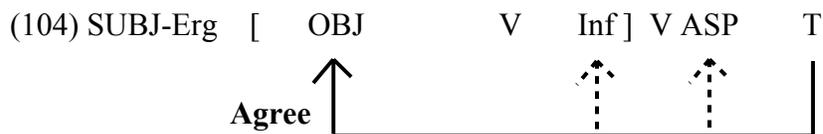
(103) vivek-ne [**kitaab** paRh-nii] chaah-ii (Hindi)

¹¹⁶This may be the case everytime an agreeing head follows the coordinated phrase, this might explain the higher frequency of FA in the SV order than in the VS order across languages.

¹¹⁷Here I do not include PRO subject in the embedded clauses, however this is just for simplicity sake, I do not make any statement about whether a PRO should be assumed in the embedded clause or not in the LDA structures. Bhatt (2005) assumes that in the LDA contexts, the structure involves restructuring which does not project PRO in the nonfinite clause. However, this is debatable, see Davison (2010) where she presents evidence that suggests that Hindi LDA constructions may not involve restructuring, and hence a PRO subject may be projected in the nonfinite clause. At this point, it seems that my analysis for LDA CCA is not affected by whether there is a PRO present in the structure or not as long as there is a way for the probes to agree with the Object argument in the embedded clause.

Vivek-Erg book.Abs.FSg read-Infin.F want-Perf.FSg
 'Vivek wanted to read the book.'

In his 2005 account, Bhatt suggests that LDA involves the higher clause T being able to probe inside the complement clause and establish Agree (specifically “AGREE” which differs from Chomsky's Agree in that it does not require active goals, i.e. goals do not need to have uninterpretable features) with a goal, an argument with relevant features within the embedded clause. This is shown in (104) below for a sentence such as (103) above. Here the higher clause T (the finite T) head probes down in its c-command domain for a goal (an argument with interpretable ϕ -features). First it comes across the Aspect head, but since the Aspect head does not have interpretable features, the T head establishes covaluation with it and further probes down (the covaluation relation between the T head and the ASP head is shown through the dotted line). In the lower clause, it comes across the Inf head and since that also does not have interpretable features, T cannot value its features against that of Inf head's, hence T establishes covaluation with it too and further probes down (again the covaluation between T and Inf are shown through the dotted line). It finds the OBJ in the embedded clause as a head with relevant interpretable features, hence it establishes Agree with it (shown through the solid line) and values its features against the OBJ's features. Due to covaluation, when T's features get valued, the intervening heads' features also get valued.



This is how LDA is obtained with a noncoordinated phrase as its goal. Now let's look at a LDA construction that involves a coordinated phrase as the goal. We find that in Hindi, even LDA can

be with the closest conjunct, i.e. LDA CCA is also possible. This is shown in (105) below, note the higher clause verb as well as the embedded clause verb agrees with the last conjunct as they follow the coordinated phrase.

(105) vivek-ne [patra aur kitaab paRh-nii] chaah-ii
 Vivek-Erg letter.MSg and book.FSg read-Inf.F want-FSg
 'Vivek wanted to read the letter and the book.'

The LDA CCA data provides us with evidence against the clausal coordination analysis and also some of the previous phrasal coordination analyses as I had mentioned above. Here I repeat the evidence against these previous analyses, and then I show how the current account for CCA (Agree in syntax + PF conditions) can even be generalized to the LDA CCA constructions.

As was mentioned above, LDA CCA presents a challenge for the clausal coordination analysis. Both predicates (the higher clause predicate as well as the embedded clause predicate) display CCA in the LDA contexts as shown in (17), (66) and (105) above. A clausal coordination analysis would assume the structure in (106a) as the underlying structure for (105).

(106) (a) [vivek-ne [patra paRh-naa] caah-aa]
 Vivek-Erg letter.MSg read-Inf.MSg want-MSg
 aur [vivek-ne [kitaab paRh-nii] caah-ii]
 and Vivek-Erg book.FSg read-Inf.FSg want-FSg

Gapping usually involves a head from within one clause but this is not the case in (106a) where a gapping analysis of CCA would require the gapping of two verbs from two clauses (the embedded clause as well as the main clause) as shown in (106b). However, if gapping indeed is the correct analysis here, then it is not clear what ensures that if gapping takes place in the

embedded clause, then it should take place in the main clause too, and vice-versa.

(106) (b)	[vivek-ne	[	patra	e _i	]	e _j]
	Vivek-Erg		letter.MSg	GAP		GAP	
	aur [vivek-ne	[	kitaab	paRh-nii _i	]	caah-ii _j]
	and Vivek-Erg		book.FSg	read-Inf.FSg		want-FSg	

A VP deletion analysis of gapping (where the whole VP is deleted/gapped rather than just the head) is also problematic for similar reasons. It is not clear what ensures that if VP deletion takes place in the embedded clause, then it should take place in the main clause too, and vice-versa. Additionally, in the VP deletion analysis, we also need to move all the other material in the VP (e.g. “patra” 'letter') to some higher position prior to VP deletion. But these movements seem stipulative without any independent motivation. Also we would need to stipulate the positions where such material (arguments as well as any adjuncts present in the clause) moves to.

Similarly as was mentioned above, Soltan's late merge (phrasal coordination) analysis also faces problems with respect to the LDA CCA data in Hindi, as shown in (17), (66), and (105) above which show LDA with the last conjunct (which is closest to the embedded verb). The problems include delaying late merge of the ConjP (Conj head together with the first conjunct) even beyond the clause, and incorrect implication about which conjunct the conjunction head forms a closer unit with.

Let us now consider the LDA CCA data in light of the current analysis. Under the current analysis, we would assume that Agree takes place in the syntax. The higher clause T head (with unvalued uninterpretable features which need to be valued) probes down in its c-command domain for a goal which has corresponding interpretable features. On its way probing down, it establishes covaluation relation with the higher clause Asp as well as embedded clause Inf head.

Eventually it finds the absolutive argument present in the embedded clause, the coordinated phrase, and it establishes Agree with this element for valuing its features. These features are to be spelled out at PF. Since Agree is established with the coordinated phrase, the agreeing head gets access to three types of features as was mentioned above: the resolved features, the features of the first conjunct and the features of the last conjunct. Since no other syntactic or LF process or pragmatic factor etc reinforces the features of the whole coordinated phrase, none of the feature sets is more activated than the other at PF. Hence PF conditions such as linear proximity, as stated in (99) above, may influence the verb to choose the closest (i.e. the last) conjunct, resulting in Long Distance Last Conjunct Agreement.

4.4. Summary

In this chapter, I have shown that the clausal coordination analysis for CCA and FA has a lot of empirical as well as theoretical problems and thus should be discarded. I also examined the previous phrasal coordination analyses and have shown that they too face problems with respect to CCA data from various languages. A few of the problems included the CCA asymmetry with respect to word order (SV vs VS) in Arabic, CCA asymmetry with respect to different types of verbs (unaccusatives vs unergatives) in Hindi, presence of both First Conjunct Agreement and Last Conjunct Agreement within the same language, the difference between languages with respect to linear adjacency requirement for CCA, the mixed agreement facts etc. Finally I presented a phrasal coordination analysis which makes use of the syntactic as well as the PF component of grammar to account for the CCA and FA facts, hence this analysis adopts a compositional view of agreement in that the agreement takes place in two stages: the relationship

between elements is established in syntax, but the features are spelled out in the PF component.

Since most of the previous analyses dealt with head initial languages, the linearly closest conjunct also used to be the hierarchically closest (i.e. the highest) conjunct in these languages. Thus it was difficult to tease apart the role of the structure of coordination and the linear order in these languages. Since in BBP 2009, I and my collaborators considered the head final languages Hindi and Tsez in our attempt to understand the agreement in the context of coordination, we were able to determine the role of the two factors in the CCA. As I had shown in chapter 3 above and also discussed in BBP (2009), the structure of coordination in these languages (Hindi and Tsez) also is head initial. However in the canonical word order, SV (i.e. head final), we observe closest conjunct agreement with the last conjunct. This suggests that the linear order plays a role in the CCA patterns. While the structure of coordination does not play any role in Hindi, a review of the literature suggests that in some languages, it indeed plays a role, as was suggested by Marušič et al (2010) for the language Slovene (which adopts the hierarchical strategy for spelling out the agreement features).

A survey of the asymmetries observed in languages with respect to CCA points in the direction that the syntactic configuration may also be relevant to the computation of CCA. Recall that the unaccusative vs unergative verbs in Hindi show different agreement possibilities with the coordinated phrase. While the unaccusative verbs may show CCA or FA, the unergative verbs only show FA. This suggests that the [spec, vP] position of the coordinated phrase may be relevant as to whether we get CCA or not. As I argued above, a spec-head agreement possibility with the v head at this position may result in the asymmetry that we observe in Hindi. Moreover the word order asymmetry in Arabic with respect to CCA provided additional support for this

view. Hence I conclude that the syntactic configuration also plays an important role in whether we get CCA or not. The Agree configuration allows access to the whole phrase' features as well as the individual conjuncts' features. However a spec-head agreement reinforces the features of the whole coordinated phrase, leading to FA possibility only. Finally the difference between Hindi and Tsez showed that the languages may employ a rather lax or a more restricted PF condition on which set of features are chosen to be spelt-out.

As I discussed above, the analysis proposed in section 4.3 above has many advantages over the previous clausal and phrasal coordination analyses for CCA and FA, for example it resolves the problems faced by the prior analyses, also it is generalizable to not just head final languages but also to head initial languages. Also it can explain certain other facts such as presence vs absence of NSIs in CCA and FA constructions, and distributive vs collective readings in CCA and FA constructions. However this analysis also faces a problem with respect to the asymmetry data from Standard Arabic. In Standard Arabic, in the SV order, we only see FA and not CCA. This is explained under the current analysis. But in the VS order, we only see CCA, the FA is not permitted in that context. The present analysis, as it is, is not able to account for this fact.¹¹⁸ At this point, I do not have any solution for this problem, I leave it for future explorations.

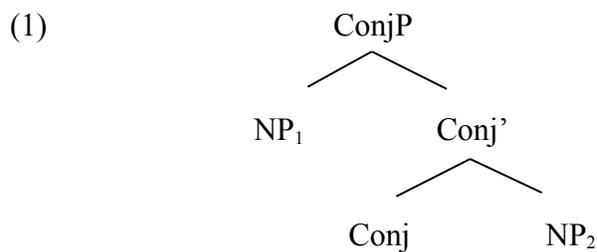
¹¹⁸However, note that the other phrasal coordination alternatives mentioned in section 4.2 also have problems in explaining all the other empirical observation as well as this observation through the same account.

5. *GENERAL DISCUSSION, CONCLUSIONS AND FUTURE WORK*

In this thesis, I focused on the problem of agreement in the context of coordination. In some languages, in this context, we observe a Closest Conjunct Agreement (CCA) pattern besides the Full Agreement (FA) pattern. The presence of CCA raises a number of issues regarding the role the syntax plays and the role the PF component plays in the agreement mechanism. From the CCA data, it is clear that the syntactic configuration (at least the canonical configuration as understood currently) is not sufficient for the agreement mechanism, however it does seem to remain an important factor in the agreement mechanism. The following questions arise: Does the word order and the structure of coordination play a role in CCA? Are the PF relations/ conditions playing any role in agreement? In this thesis, I have attempted to tease apart the role of the structure of coordination, the syntactic configuration and the linear relations/ conditions in the agreement phenomenon in the context of coordination using a head final language Hindi.

Most of the CCA data in the literature involves head initial languages. In head initial languages, it is difficult to tease apart the role of the structure of coordination in CCA and the role of linear proximity since the conjunct that is structurally higher in the coordination structure (i.e. the first conjunct) is also linearly closer to the agreeing head (note VS order). This could, however, be tested in a language where the structure of coordination marks one conjunct higher whereas linear proximity marks the other conjunct as closer. Hindi (the language I focused on for this dissertation) is precisely such a language. I have shown that Hindi has a head initial structure

of coordination rather than a head final structure based on the diagnostics such as binding, extraposition, prosody and wh-extraction. Thus the leftmost conjunct asymmetrically c-commands the rightmost conjunct in Hindi, see (1) below. This structure of the coordinated phrase in Hindi is supported by the fact that there are a few other phrases with head initial structure as well in Hindi.



Since the structure of coordination is head initial in Hindi (thus the first conjunct is more prominent than the last conjunct), just like the head initial languages, and since the CCA is sensitive to the surface linear order (note the S(O)V order canonically, thus the last conjunct is closer), CCA cannot be accounted for by a structural asymmetry in the coordination structure. I propose a new analysis of CCA which considers the role of linear adjacency (or linear proximity) in spelling out the agreement features. However, it should be noted that even though the agreement data from Hindi suggests that the structure of coordination does not play any role in the CCA, it seems that some languages may make use of that, e.g. Slovene (as mentioned in Marušič et al 2007 and Marušič et al 2010) where the verb may agree with the highest conjunct.

Regarding the agreement configuration, it has been suggested that the CCA might involve clausal coordination with conjunction reduction, as a result of which, for example, the verb in each clause agrees with its own argument (ABS 1994). In this dissertation, I have tested this theory and presented arguments against it. For example, I have shown that the processes

such as gapping, VP ellipsis and RNR which have been proposed for conjunction reduction have theoretical as well as empirical problems and hence should not be taken to be involved to result in the CCA constructions. Also, as Hartmann (2000) points out, the reduction approach creates empty elements or assumes base-generated empty elements which do not fit into the well-established typology of syntactic empty categories. The presumed sentences before reduction are found to be unacceptable (e.g. Marušič et al 2007), or they are found to not have the same meaning as the reduced form, or they seem an incorrect representation of a physical event. Even the motivating factors for the clausal analyses do not always work, for example, CCA may not necessarily bleed presence of plural predicates/NSIs across languages (see section 4.1.2.3, also see Marušič et al 2007). The diagnostics for clausal vs phrasal coordination, such as constituency tests, do not support the clausal coordination analysis for Hindi CCA facts when looked at carefully.

I considered the previous phrasal coordination analyses and have presented arguments against them as well. Most of these analyses assumed the structure of coordination to play a role in CCA, but as I mentioned above, this is not the factor for CCA in all the languages (even though languages such as Slovene seem to involve the structure of coordination as a relevant factor in CCA). A few of the problems faced by these analyses involve the CCA asymmetry with respect to word order (SV vs VS) in Arabic, CCA asymmetry with respect to different types of verbs (unaccusatives vs unergatives) in Hindi, presence of both the First Conjunct Agreement and the Last Conjunct Agreement within the same language, the difference between languages with respect to linear adjacency requirement for CCA, the mixed agreement facts etc.

An alternative analysis is proposed which assumes the role of the syntactic configuration of agreement as well as the linear proximity. This analysis assumes a compositional approach to agreement (many others have also adopted some version of the compositional approach to agreement, see, for example, Franck et al. 2002, Ackema and Neeleman 2004, Haskell and MacDonald 2005, Benmamoun and Lorimor 2006, Bhatia and Benmamoun 2009, among others). Under this approach, agreement takes place in two stages: first in the syntax and then in the PF. Thus for the CCA data in Hindi, we can say that first the agreement relationship is established between the probe(s), i.e. the T and Asp heads, and the coordinated phrase in the syntactic component. Then, this relationship is satisfied post-syntactically (at PF) by spelling out the features of either the whole coordinated phrase or the features of the linearly closest conjunct within this coordinated phrase.

Thus in this analysis, the syntactic relation “Agree” (i.e. AGREE for Hindi) is crucial for CCA in Hindi, just as it is in many previous analyses, but the syntactic configuration involving an asymmetric coordination does not play any role in Hindi; instead a PF condition of linear proximity/adjacency plays a role. The Agree configuration allows access to the whole phrase' features as well as the internal structure of the coordinated phrase (and hence the individual conjuncts' features too). However, note that a spec-head agreement (with the v head in Hindi) reinforces the features of the whole coordinated phrase, leading to the FA possibility only. The fact that Hindi allows both First Conjunct Agreement and Last Conjunct Agreement implies the role of linear proximity.

This analysis is more uniform, not just across different constructions (First Conjunct Agreement constructions and Last Conjunct Agreement constructions) within the same language

but also across language types (head initial and head final languages).

The possibility of choosing one conjunct for spell-out may be limited by language processing constraints. For example, in Hindi, CCA may be possible if the intervening material is smaller in size than when it is larger. It may also depend on the strictness of the condition of linear proximity/ adjacency in the language. For example, in some other languages, e.g. Tsez, no intervening material is allowed (BBP 2009), whereas in other languages, such as Hindi, intervening material is permitted.

The view that the agreement relation is established in syntax but the features are spelled out in the PF component, and the PF component may not be completely faithful to syntax while spelling out the features gets support from various empirical observations. For example, as is mentioned in BBP (2009), Noyer (1992) shows that the agreement features may get altered (for instance, through impoverishment) in PF, Badecker (2007), using an optimality theoretic model, suggests that it may be possible to get an output that violates the faithfulness constraint if some other constraint is ranked higher than the faithfulness constraint. With respect to CCA, the syntax establishes the relation between the agreeing head and the coordinated phrase and thus marks the phrase from which the PF component can extract the agreement features which need to be spelled out. The syntax/LF may block the application of the PF conditions of linear proximity/ adjacency by reinforcing the syntactic relations, in such a case the PF is completely faithful to syntax and yields FA. Thus if the PF conditions of linear proximity/ adjacency do not apply (due to some reason, e.g. presence of NSIs or the spec-head agreement with the v head in Hindi or unavailability of the prosodic incorporation of the external argument with the V head), PF remains completely faithful to syntax and spells-out features based on the syntactic relation itself

and hence results in FA. If, on the other hand, the PF conditions of linear proximity/ adjacency are not blocked, then the features may be extracted from a constituent within the phrase with which syntactic agreement relation was established, but the PF is not completely faithful to syntax here and may look inside the phrase linearly for the features, and thus result in CCA.¹¹⁹

The PF conditions of linear proximity/ adjacency leading to CCA may point towards a possible prosodic grouping (of, say, the agreeing heads with the agreed-with conjunct), however the prosodic domain under CCA still needs to be determined for Hindi (as well as for other CCA languages discussed in the literature). As was mentioned in BBP (2009), if we do find an evidence for a prosodic relation between the two elements (the agreeing head and the closest conjunct), that would strengthen our conception of attributing CCA to spell-out at PF. Since in Hindi, CCA takes place in both the directions, i.e. First Conjunct Agreement as well as Last Conjunct Agreement, we would need to test if the verb forms a prosodic unit with a conjunct both when it precedes it and when it follows it. Hence a possible direction for future research is to study the prosody of coordination, agreement, and word order in Hindi, and in other languages.

Finally, in this thesis, I have focused on the verbal agreement (CCA and FA), however, it would be interesting to see if similar CCA and FA facts are observed with respect to the so-called concord agreement as well, e.g. the adjectival agreement. I have conducted, together with Heidi Lorimor, a preliminary study involving predicative adjectives in Hindi to see if predicative adjectives also show similar agreement facts as the verbs show. We do find that the predicative adjectives also show both the CCA and the FA patterns, however a more detailed analysis is

¹¹⁹Note the PF is not completely unfaithful to the syntax either in such cases, since even though it looks inside the phrase linearly rather than on the whole phrase itself, the phrase it looks inside is still the one with which the syntactic relation has been established.

needed to see if there are any mismatches between the verbal and the adjectival agreement. Also this study involved adjectives as well as the verbal elements on the same side of the coordinated phrase (i.e. both the predicative adjective as well as the verb follow the coordinated phrase, it would be interesting to see if mixed agreement facts can be observed when the coordinated phrase is sandwiched between the verbal and the adjectival element on either side. I leave these issues for future work.

REFERENCES

- Ackema, Peter, & Ad Neeleman. 2004. *Beyond morphology: Interface conditions on word formation*. Oxford: Oxford University Press.
- Anand, Pranav, & Andrew Nevins. 2006. Some Ergative Subjects Don't Reconstruct. In *Ergativity: Emerging Issues*, ed. by Alana Johns, Diane Massam and Juvenal Ndayiragije, 3-27. Dordrecht: Kluwer Academic Publishers.
- Anderson, Stephen R. 1992. *A-morphous Morphology*. Cambridge: Cambridge University Press.
- Arnold, Doug, Louisa Sadler, & Aline Villavicencio. 2007. Portuguese: Corpora, coordination and agreement. In *Roots: Linguistics in search of its evidential base 96*, ed. by Sam Featherston and Wolfgang Sternefeld, 9-28. *Studies in Generative Grammar*. Berlin: Mouton de Gruyter.
- Aoun, Joseph, & Elabbas Benmamoun. 1999. Gapping, PF merger, and patterns of partial agreement. In *Fragments: Studies in ellipsis and gapping*, ed. by Shalom Lappin and Elabbas Benmamoun, 170–187. Oxford: Oxford University Press.
- Aoun, Joseph, Elabbas Benmamoun, & Dominique Sportiche. 1994. Agreement and conjunction in some varieties of Arabic. *Linguistic Inquiry* 25, 195-220. [ABS 1994]
- Aoun, Joseph, Elabbas Benmamoun, & Dominique Sportiche. 1999. Further Remarks on First Conjunct Agreement. *Linguistic Inquiry* 30, 669–681.
- Babyonyshev, Maria A. 1996. *Structural connections in syntax and processing: studies in Russian and Japanese*. Doctoral dissertation. Massachusetts Institute of Technology.
- Badecker, William. 2007. A feature principle for partial agreement. *Lingua* 117.9, 1541-1565.

- Baker, Mark C. 2008. *The Syntax of Agreement and Concord*. Cambridge: Cambridge University Press.
- Barss, Andrew, & Howard Lasnik. 1986. A Note on Anaphora and Double Objects. *Linguistic Inquiry* 17, 347-354.
- Benmamoun, Elabbas. 1992. *Functional and Inflectional Morphology: Problems of Projection, Representation and Derivation*. Doctoral dissertation. University of Southern California, Los Angeles, CA.
- Benmamoun, Elabbas. 2000. Agreement Asymmetries and the PF Interface. In *Research in Afroasiatic Grammar*, ed. by Jacqueline Lecarme, Jean Lowenstamm and Uri Shlonsky, 23-40. Amsterdam/Philadelphia: John Benjamins.
- Benmamoun, Elabbas, & Archana Bhatia. 2010. The Structure of Coordination and Close Conjunct Agreement. <http://ling.auf.net/lingBuzz/001125>. [B&B 2010]
- Benmamoun, Elabbas, Archana Bhatia, & Maria Polinsky. 2010. Closest conjunct agreement in head final languages. *Linguistic Variation Yearbook 2009*, 67-88. Amsterdam/Philadelphia: John Benjamins Publishing Company. [BBP 2009]
- Benmamoun, Elabbas and Heidi Lorimor. 2006. "Featureless expressions: When morphophonological markers are absent". *Linguistic Inquiry* 37, 1-23.
- Bhatia, Archana and Elabbas Benmamoun. 2009. "Close conjunct agreement: Role of linear adjacency". Paper presented at the 2009 Annual Meeting of the LSA.
- Bhatia, Tej Krishan. 1987. *A History of the Hindi Grammatical Tradition: Hindi-Hindustani Grammar, Grammarians, History and Problems*. Leiden: E. J. Brill.

- Bhatt, Rajesh. 1996. Matching Effects and the Syntax-Morphology Interface: Evidence from Hindi Correlatives. *MIT Working Papers in Linguistics* 31, 53-68.
- Bhatt, Rajesh. 2003. Topics in the Syntax of the Modern Indo-Aryan Languages. Accessed at <http://web.mit.edu/rbhatt/www/24.956/l2.pdf>.
- Bhatt, Rajesh. 2005. Long- Distance Agreement in Hindi-Urdu. *Natural Language and Linguistic Theory* 23.4, 757-807.
- Bhatt, Rajesh, & Martin Walkow. 2010. Asymmetries in Conjunct Agreement. *U. Penn Working Papers in Linguistics* 14.2, 1-10.
- Bittner, Maria, & Kenneth Hale. 1996. Ergativity: Toward a theory of a heterogeneous class. *Linguistic Inquiry* 27.4, 531-604.
- Bock, Kathryn, Janet Nicol, & J. Cooper Cutting. 1999. The Ties That Bind: Creating Number Agreement in Speech. *Journal of Memory and Language* 40, 330-346.
- Boeckx, Cedric. 2008. *Aspects of the Syntax of Agreement*. New York: Routledge.
- Borer, Hagit. 1989. On the morphological parallelism between compounds and construct state nominals. *The Morphology Yearbook I*, ed. by G. Booij and J. van Marle, 45-65. Dordrecht: Foris Publications.
- Bošković, Zeljko. 2009. Unifying first and last conjunct agreement. *Natural Language and Linguistic Theory* 27, 455-496.
- Bošković, Zeljko. 2010. Conjunct-Sensitive Agreement: Serbo-Croatian vs Russian. In *FSSL. Proceedings of FDSL 7.5*, ed. by G. Zybatow, P. Dudchuk, S. Minor, and E. Pshehotskaya, 31-48.

- Bresnan, Joan. 1974. The position of certain clause-particles in phrase structure. *Linguistic Inquiry* 5, 614-619.
- Butt, Miriam. 1995. *The Structure of Complex Predicates in Urdu*. Stanford: CSLI Publications.
- Butt, Miriam, & Tracy Holloway King. 1991. Semantic case in Urdu. In *Papers from the 27th Regional Meeting of the Chicago Linguistics Society*, ed. by L. Dobrin, L. Nichols, and R.M. Rodriguez, 31-45.
- Carstens, Vicki. 2000. Concord in minimalist theory. *Linguistic Inquiry* 31.2, 319-355.
- Camacho, José. 1997. *The Syntax of NP Conjunction*. Doctoral dissertation. University of Southern California.
- Camacho, José. 2000. On the Structure of Coordination. In *Ellipsis in Conjunction*, ed. by K. Schwabe & Nina Zhang, 1-22. Tübingen: Niemeyer Verlag.
- Camacho, José. 2003. *The Structure of Coordination: Conjunction and Agreement Phenomena in Spanish and Other Languages*. Dordrecht: Kluwer Academic Publishers.
- Chao, Wynn. 1988. *On Ellipsis*. New York: Garland Publishing, Inc.
- Chomsky, Noam. 1957. *Syntactic Structures*. The Hague: Mouton.
- Chomsky, Noam. 1965. *Aspects of a Theory of Syntax*. Cambridge, MA: MIT Press.
- Chomsky, Noam. 1966. *Cartesian linguistics: a chapter in the history of rationalist thought*. New York: Harper & Row.
- Chomsky, Noam. 1973. Conditions on transformations. In *A Festschrift from Morris Halle*, ed. by Stephen R. Anderson and Paul Kiparsky. New York: Holt, Rinehart and Winston.
- Chomsky, Noam. 1986. *Barriers*. Cambridge, MA: MIT Press.

- Chomsky, Noam. 1991. Some notes on economy of derivation and representation. In *Principles and Parameters in Comparative Grammar*, ed. by Robert Freidin, 417-454. Cambridge, MA: MIT Press.
- Chomsky, Noam. 1993. A minimalist program for linguistic theory. In *The view from building 20*, ed. by K. Hale and A. Marantz. Cambridge, MA: MIT Press.
- Chomsky, Noam. 1995. *The Minimalist Program*. Cambridge, MA: MIT Press.
- Chomsky, Noam. 2000. Minimalist Inquiries: The Framework. In *Step by Step: Essays on Minimalist Syntax in honor of Howard Lasnik*, ed. by Roger Martin, David Michaels, and Juan Uriagereka, 89-155. Cambridge, MA: MIT Press.
- Chomsky, Noam. 2001. Derivation by phase. In *Ken Hale: A Life in Language*, ed. by Michael Kenstowicz, 1-52. Cambridge, MA: MIT Press.
- Chomsky, Noam, & Howard Lasnik. 1993. The Theory of Principles and Parameters. In *Syntax: An International Handbook of Contemporary Research*, ed. by J. Jacobs, A. von Stechow, W. Sternefeld, and T. Vennemann, 506-569. Berlin: Mouton de Gruyter.
- Chung, Sandra. 1998. *The Design of Agreement*. Chicago, IL: University of Chicago Press.
- Citko, Barbara. 2004. Agreement Asymmetries in Coordinate Structures. In *Formal Approaches to Slavic Linguistics 12: The Ottawa meeting 2003*. Ann Arbor, MI: Michigan Slavic Publications.
- Corbett, Greville G. 1990. *Gender*. Cambridge: Cambridge University Press.
- Corbett, Greville G. 2006. *Agreement*. Cambridge: Cambridge University Press.

- Curme, George Oliver. 1935. *A grammar of the English language. Vol II: Parts of speech and accidence*. New York: Heath.
- Davison, Alice. 1991a. Feature percolation and agreement in Hindi-Urdu. Paper presented at the South Asian Conference, University of Wisconsin.
- Davison, Alice. 1991b. Finiteness and case in Hindi-Urdu complements. Paper presented at the eleventh South Asian Languages Analysis Roundtable, University of Illinois, Urbana-Champaign.
- Davison, Alice. 2003. Non-nominative subjects in Hindi-Urdu VP structure and case parameters. Accessed at <http://www.uiowa.edu/~linguist/faculty/davison/nonnom.PDF>.
- Davison, Alice. 2004. Structural Case, Lexical Case, and the Verbal Projection. In *Clause Structure in South Asian Languages*, ed. by Veneeta Dayal and Anoop Mahajan, 119-225. Dordrecht: Kluwer.
- Davison, Alice. 2006. Word order, parameters, and the Extended COMP projection. <http://www.uiowa.edu/~linguist/faculty/davison/wordord.pdf>.
- Davison, Alice. 2010. Remarks on Long-Distance Agreement and Restructuring. Ms., University of Iowa.
- Dik, Simon C. 1968. *Coordination: Its implications for the theory of general linguistics*. Amsterdam: North-Holland Publishing Co.
- Dixon, Robert M.W. 1979. Ergativity. *Language* 55.1, 59-138.
- Donaldson, Susan K. 1971. Movement in Restrictive Relative Clauses in Hindi. In *Studies in the Linguistic Sciences 1.2, Special Issue on Papers on Hindi Syntax*, ed. by Yamuna Kachru, 1-74.

- Doron, Edit. 2005. VSO and Left-conjunct Agreement: Biblical Hebrew vs. Modern Hebrew. In *Universal Grammar in the Reconstruction of Dead Languages*, ed. by Katalin É.Kiss, 239-264. Berlin: Mouton.
- Dougherty, Ray C. 1970. A Grammar of Coördinate Conjoined Structures: I. *Language* 46.4, 850-898.
- Dwivedi, Veena. 1991. Negation as a Functional Projection in Hindi. In *Proceedings of the Western Conference on Linguistics* 4, 88-100.
- Enç, M. 1991. The Semantics of Specificity. *Linguistic Inquiry* 22.1, 1-25.
- Epstein, Samuel David. 1999. Un-Principled Syntax: The Derivation of Syntactic Relations. In *Working Minimalism*, ed. by Samuel David Epstein & Norbert Hornstein, 317-345. Cambridge, MA: MIT Press.
- Epstein, Samuel David, & Norbert Hornstein (eds.). 1999. *Working Minimalism*. Cambridge, MA: MIT Press.
- Franck, Julie, Gabriella Vigliocco, & Janet Nicol. 2002. Attraction in sentence production: The role of syntactic structure. *Language and Cognitive Processes* 17.4, 371-404.
- Fitzpatrick, Justin M. 2002. On Minimalist Approaches to the Locality of Movement. *Linguistic Inquiry* 33.3, 443-463.
- Gambhir, Vijay. 1981. *Syntactic restrictions and discourse functions of word order in standard Hindi*. Doctoral dissertation. University of Pennsylvania.
- Gazdar, Gerald. 1981. Unbounded Dependencies and Coordinate Structure. *Linguistic Inquiry* 12.2, 155-184.

- Gazdar, Gerald, E. Klein, Geoffrey Pullum, & Ivan Sag. 1985. *Generalized Phrase Structure Grammar*. Cambridge, MA: Harvard University Press.
- Givón, Talmy. 1984. *Syntax I*. Amsterdam/Philadelphia: John Benjamins.
- Gleitman, L.R. 1965. Coordinating Conjunctions in English. *Language* 41, 260-293.
- Goodall, Grant. 1987. *Parallel Structures in Syntax: Coordination, causatives, and restructuring*. Cambridge: Cambridge University Press.
- Guru, Kamtaprasad. 1977. *Hindi Vyakaran*. Varanasi: Nagari Pracharini sabha.
- Halle, Morris, & Alec Marantz. 1993. Distributed Morphology and the Pieces of Inflection. In *The View from Building 20*, ed. by Kenneth Hale & S. Jay Keyser, 111-176. Cambridge: MIT Press.
- Hankamer, Jorge. 1979. *Deletion in Coordinate Structures*. New York/London: Garland Publishing, Inc.
- Harbert, Wayne, & Maher Bahloul. 2002. Postverbal subjects in Arabic. In *Themes in Arabic and Hebrew Syntax*, ed. by Jamal Ouhalla & Ur Shlonsky, 45-70. Dordrecht: Kluwer Academic Publishers.
- Hardt, Daniel. 1993. *Verb phrase ellipsis: Form, meaning, and processing*. Doctoral dissertation. University of Pennsylvania.
- Hartmann, Katharina. 2000. *Right Node Raising and Gapping: Interface Conditions on Prosodic Deletion*. Philadelphia/Amsterdam: John Benjamins Publishing Company.
- Haskell, Todd, & Maryellen MacDonald. 2005. Constituent structure and linear order in language production: Evidence from subject-verb agreement. *Journal of Experimental Psychology: Learning, Memory, and Cognition* 31, 891-904.

- Henderson, Brent. 2006. *The Syntax and Typology of Bantu Relative Clauses*. Doctoral dissertation. University of Illinois at Urbana-Champaign.
- Hudson, Richard A. 1970. On clauses containing conjoined and plural noun phrases in English. *Lingua* 24.3, 205-253.
- Hudson, Richard A. 1976. Conjunction reduction, gapping, and right node raising. *Language* 52, 535-562.
- Inkelas, Sharon, & Draga Zec. 1990. Prosodically Constrained Syntax. In *The Phonology-Syntax Connection*, ed. by Sharon Inkelas & Draga Zec, 365-378. Chicago: CSLI.
- Jackendoff, Ray. 1997. *The Architecture of the Language Faculty*. Cambridge: MIT Press.
- Johnson, Kyle. 2009. Gapping Is Not (VP-) Ellipsis. *Linguistic Inquiry* 40.2, 289-328.
- Johannessen, Janne Bondi. 1996. Partial Agreement and Coordination. *Linguistic Inquiry* 27.4, 661-676.
- Johannessen, Janne Bondi. 1998. *Coordination*. Oxford: Oxford University Press.
- Kachru, Yamuna. 1965. *A Transformational Treatment of Hindi Verbal Syntax*. Doctoral dissertation. University of London.
- Kachru, Yamuna. 1966. *An introduction to Hindi syntax*. Urbana, IL: University of Illinois Press.
- Kachru, Yamuna. 1971. The syntax of ko-sentences in Hindi-Urdu. *Papers in Linguistics* 2.2, 229-316. Linguistic Research, Inc.
- Kachru, Yamuna. 1980. *Aspects of Hindi Grammar*. New Delhi: Manohar Publications.
- Kachru, Yamuna. 1981. Transitivity and volitionality in Hindi-Urdu. *Studies in the Linguistic Sciences* 11.2, 181-194.

- Kachru, Yamuna. 1987. Ergativity, Subjecthood and Topicality in Hindi-Urdu. *Lingua* 71, 223-238.
- Kachru, Yamuna. 1990. Experiencer and other oblique subjects in Hindi. In *Experiencer Subjects in South Asian Languages*, ed. by Manindra K. Verma & K.P. Mohanan, 59-75. Stanford University, Stanford, CA: The Centre for the Study of Language and Information.
- Kachru, Yamuna. 2006. Hindi. Amsterdam; Philadelphia, PA: John Benjamins Publishing Co.
- Kaisse, Ellen. 1985. *Connected Speech: The Interaction of Syntax and Phonology*. San Diego: Academic Press.
- Kaplan, Ron M., & John T. Maxwell III. 1995. Constituent Coordination in Lexical-Functional Grammar. In *Formal Issues in Lexical-Functional Grammar*, ed. by Mary Dalrymple, Ron M. Kaplan, John T. Maxwell & Annie Zaenen, 199-210. Stanford, CA: CSLI Publications.
- Kathol, Andreas. 1999. Agreement and the syntax-morphology interface in HPSG. In *Studies in Current Phrase Structure Grammar*, ed. by Robert Levine and Georgia Green, 223-274. Cambridge University Press.
- Kawahara, Shigeto, & Takahito Shinya. 2008. The Intonation of Gapping and Coordination in Japanese: Evidence for Intonational Phrase and Utterance. *Phonetica* 65, 62-105.
- Kayne, Richard. 1989. Null Subjects and Clitic Climbing. In *The Null Subject Parameter*, ed. by Osvaldo Jaeggli and Kenneth J. Safir, 239-261. Dordrecht: Reidel.
- Kayne, Richard. 1994. *The Antisymmetry of Syntax*. Cambridge: MIT Press.
- Kellogg, Samuel H. 1938. Grammar of the Hindi language. London: Kegan Paul, Trench, Trubner and Co.

- Khan, Baber. 1987. The Ergative Case in Hindi-Urdu. *Studies in the Linguistic Sciences* 17.1, 91-101.
- Kidwai, Ayesha. 2000. *XP-Adjunction in Universal Grammar: Scrambling and binding in Hindi-Urdu*. Oxford: Oxford University Press.
- King, Tracy Holloway, & Mary Dalrymple. 2004. Determiner agreement and noun conjunction. *Journal of Linguistics* 40, 69-104.
- Kitagawa, Yoshihisa. 1986. Subjects in Japanese and English. Doctoral dissertation. University of Massachusetts, Amherst.
- Kitahara, Hisatsugu. 1997. *Elementary operations and optimal derivations*. Cambridge, MA: MIT Press.
- Koopman, Hilda. 1992. On the absence of case chains in Bambara. *Natural Language and Linguistic Theory* 10, 555-594.
- Koopman, Hilda. 1995. The spec-head relation. Ms., UCLA.
- Koopman, Hilda. 2001. DP-structure in Masaai. Ms., UCLA.
- Koopman, Hilda. 2006. Agreement configurations: In defense of “Spec head”. In *Agreement Systems*, ed. by Cedric Boeckx, 159–199. Amsterdam: John Benjamins Publishing Company.
- Koopman, Hilda and Dominique Sportiche. 1991. The Position of Subjects. *Lingua* 85, 211-258.
- Koopman, Hilda, and Dominique Sportiche. 1988. Subjects. Ms., UCLA, Los Angeles, CA.
- Kuroda, S.-Y. 1988. Whether we agree or not: A comparative syntax of English and Japanese. *Lingvisticae Investigationes* 12, 1-47.

- Lakeoff, George, & Stanley Peters. 1966. Phrasal conjunction and symmetric predicates. In *Mathematical Linguistics and Automatic Translation*. Cambridge, MA: Harvard University.
- Larson, Richard K. 1990. Double Objects Revisited: Reply to Jackendoff. *Linguistic Inquiry* 21, 589-563.
- Lasersohn, Peter. 1995. *Plurality, Conjunction and Events*. Dordrecht: Kluwer Academic Publishers.
- Lebeaux, David. 1988. *Language Acquisition and the Form of the Grammar*. Doctoral dissertation. University of Massachusetts.
- Lehmann, Christian. 1988. On the Function of Agreement. In *Agreement in Natural Language: Approaches, Theories, Descriptions*, ed. by Michael Barlow & Charles A. Ferguson, 55-65. Stanford, CA: CSLI Publications.
- Lorimor, Heidi. 2007. *Conjunctions and Grammatical Agreement*. Doctoral dissertation. University of Illinois at Urbana-Champaign.
- Mahajan, Anoop. 1989. Agreement and Agreement Phrases. *MIT Working Papers in Linguistics* 10, ed. by Itziar Laka and Anoop Mahajan, 217-252. Cambridge, MA: MIT Department of Linguistics and Philosophy.
- Mahajan, Anoop. 1990. *The A/A-Bar Distinction and Movement Theory*. Doctoral dissertation. MIT.
- Maling, Joan, M. 1972. On "Gapping and the Order of Constituents". *Linguistic Inquiry* 3.1, 101-108.

- Marantz, Alec. 1988. Clitics, morphological merger, and the mapping to phonological structure. In *Theoretical Morphology: Approaches in Modern Linguistics*, ed. by Michael Hammond and Michael Noonan, 253-270. San Diego: Academic Press.
- Marušič, Franc, Andrew Nevins, & Amanda Saksida. 2007. Last-Conjunct Agreement in Slovenian. In *Annual Workshop on [Formal] Approaches to [Slavic] Linguistics: The Toronto Meeting 2006, FASL 15*, ed. by Richard Compton, Magdalena Golezdzinowska & Ulyana Savchenko, 210-227. Ann Arbor: Michigan Slavic Publications.
- Marušič, Franc, Andrew Nevins, & William Badecker. 2010. The Grammars of Conjunction Agreement in Slovenian. Accessed at <http://ling.auf.net/lingBuzz/001131>.
- McGregor, R.S. 1972. *Outline of Hindi Grammar with exercises*. Oxford: Clarendon Press.
- Mohammad, M.A. 1988. Nominative case, I-subjects, and subject-verb agreement. In CLS 24. Part 2, *Proceedings of the Parasession on Agreement in Grammatical Theory*, 223-235. Chicago, IL: Chicago Linguistics Society.
- Mohanan, Tara. 1990. *Argument Structure in Hindi*. Doctoral dissertation. Stanford University. Stanford: CSLI Publications.
- Müller, Gereon. 1996. A constraint on remnant movement. *Natural Language & Linguistic Theory* 14, 355-407.
- Munn, Alan Boag. 1987. Coordinate Structure and X-bar Theory. *McGill Working Papers in Linguistics 4-1*, 121-140.
- Munn, Alan Boag. 1992. A null operator analysis of ATB gaps. *The Linguistic Review* 9, 1-26.

- Munn, Alan Boag. 1993. *Topics in the Syntax and Semantics of Coordinate Structures*. Doctoral dissertation. University of Maryland.
- Munn, Alan Boag. 1999. First Conjunct Agreement: Against a Clausal Analysis. *Linguistic Inquiry* 30.4, 643-668.
- Munn, Alan. 2000. Three Types of Coordination Asymmetries. In *Ellipsis in Conjunction*, ed. by Kerstin Schwabe & Ning Zhang, 1-22. Tübingen: Max Niemeyer Verlag.
- Nespor, Marina, & Irene Vogel. 1986. *Prosodic Phonology*. Dordrecht, Foris.
- Noyer, Rolf. 1992. *Features, positions, and affixes in autonomous morphological structure*. PhD dissertation, MIT.
- Pandharipande, Rajeshwari, & Yamuna Kachru. 1977. Relational Grammar, Ergativity and Hindi-Urdu. *Lingua* 41.3, 217-238.
- Polinsky, Maria and Bernard Comrie. 1999. Agreement in Tsez. *Folia Linguistica* 33, 109-130.
- Pollock, Jean-Yves. 1989. Verb movement, universal grammar, and the structure of IP. *Linguistic Inquiry* 20.3, 365-424.
- Postal, Paul M. 1974. *On Raising*. Cambridge, MA: MIT Press.
- Progovac, Ljiljana. 1997. Slavic and the Structure for Coordination. In *Formal Approaches to Slavic Linguistics*, ed. by M. Lidseth & S. Franks, 207-223. Ann Arbor: Michigan Slavic Publications.
- Rezac, Milan. 2008. Phi-Agree and theta-related Case. In *Φ theory: Φ-features across interfaces and modules*, ed. by Daniel Harbour, David Adger, and Susana Béjar. 83-129. Oxford: Oxford University Press.
- Rizzi, Luigi. 1990. *Relativized Minimality*. Cambridge, MA: MIT Press.

- Roberts, Ian. 1985. Agreement parameters and the development of English modal auxiliaries. *Natural Language and Linguistic Theory* 3.1, 16-25.
- Roberts, Taylor. 1999. Unbalanced Coordination and Resumptive Pronouns. Papers on Morphology and Syntax, Cycle One. Originally in *MIT Working Papers in Linguistics* 33, 323-341.
- Ross, John Robert. 1967. *Constraints on Variables in Syntax*. Doctoral dissertation. MIT.
- Ross, John Robert. 1970. Gapping and the order of constituents. In *Progress in linguistics*, ed. by Manfred Bierwisch and Karl Erich Heidolph. The Hague: Mouton.
- Sadler, Louisa. 1999. Non-distributive features and coordination in Welsh. In *On-line Proceedings of the LFG99 Conference*, ed. by Miriam Butt and Tracy Holloway King. URL <http://eslipublications.stanford.edu/LFG/4/lfg99.html>.
- Sadler, Louisa. 2003. Asymmetric coordination and agreement in LFG. In *Nominals: Inside and Out*, ed. by Miriam Butt and Tracy Holloway King. Stanford, CA: CSLI Publications.
- Sadock, Jerrold. 1985. *Autolexical Syntax: A Theory of Parallel Grammatical Representations*. Chicago: University of Chicago Press.
- Sag, Ivan. 1976. A logical theory of verb phrase deletion. In *Papers from the 12th Regional Meeting of the Chicago Linguistic Society, April 23-25, 1976*, ed. by Salikoko Mufwene, Carol A. Walker, and Sanford B. Steever, 533-542. Chicago: Chicago Linguistic Society.
- Sag, Ivan A., Gerald Gazdar, Thomas Wasow, & Steven Weisler. 1985. Coordination and How to Distinguish Categories. *Natural Language and Linguistic Theory* 3.2, 117-171.

- Sauerland, Uli. 1999. Erasability and interpretation. *Syntax* 2, 161-188.
- Selkirk, Elizabeth. 1986. On derived domains in sentence phonology. *Phonology* 3: 371-405.
- Shapiro, Michael C. 1989. A Primer of modern standard Hindi. Delhi: Motilal Banarsidass.
- Soltan, Usama. 2006. Standard Arabic subject-verb agreement asymmetry revisited in an Agree-based minimalist syntax. In *Agreement Systems*, ed. by Cedric Boeckx, 239-265. Amsterdam: John Benjamins.
- Soltan, Usama. 2007. On agree and postcyclic merge in syntactic derivations: First conjunct agreement in standard Arabic. In *Perspectives on Arabic Linguistics XIX*, ed. by Elabbas Benmamoun, 191-213. Amsterdam: John Benjamins Publishing Company.
- Sportiche, Dominique. 1988. A theory of floating quantifiers and its corollaries for constituent structure. *Linguistic Inquiry* 19, 425-449.
- Sportiche, Dominique. 1990. Movement, Agreement, and Case. Ms., UCLA. Published in Sportiche, Dominique. 1998. *Partitions and Atoms of Clause Structure. Subjects, Agreement, Case, and Clitics*. London: Routledge.
- Sportiche, Dominique. 1998. *Atoms and Particles of Phrase Structure*. London: Routledge.
- Subbarao, K.V. 1984. *Complementation and Hindi syntax*. Delhi: Academic Publications.
- Swift, Jonathan. 1994 [1735]. *Gulliver's Travels*. Ed. by Paul Turner. New York: Oxford University Press.
- Tancredi, Christopher. 1992. *Deletion, deaccenting and presupposition*. Doctoral dissertation. MIT.
- te Velde, John R. 2005. *Deriving Coordinate Symmetries: A phase-based approach integrating Select, Merge, Copy and Match*. Amsterdam: John Benjamins Publishing Company.

- Tokizaki, Hisao. 1999. Prosodic Phrasing and Bare Phrase Structure. In *Proceedings of NELS 29*, 381-395. Amherst, MA: GLSA.
- Van Koppen, Marjo. 2005. One Probe- Two Goals: Aspects of agreement in Dutch dialects. Netherlands: LOT.
- Van Koppen, Marjo. 2008. Agreement with coordinated subjects: A comparative perspective. *Linguistic Variation Yearbook 7*, 121-161. Amsterdam/Philadelphia: John Benjamins Publishing Company.
- Wasow, Thomas. 1972. *Anaphoric relations in English*. Doctoral dissertation. MIT.
- Wechsler, Stephen, & Larisa Zlatic. 2000. A Theory of Agreement and Its Application to Serbo-Croatian. *Language 76.4*, 799-832.
- Wechsler, Stephen, & Larisa Zlatic. 2003. *The Many Faces of Agreement*. Stanford, CA: CSLI Publications.
- Wexler, Kenneth N., & Peter W. Culicover. 1980. *Formal Principles of Language Acquisition*. Cambridge, MA: MIT Press.
- Williams, Edwin. 1990. The ATB Theory of Parasitic Gaps. *The Linguistic Review 6*, 265-279.
- Winkler, Susanne. 2005. *Ellipsis and Focus in Generative Grammar*. Berlin/New York: Mouton de Gruyter.
- Yates, W. 1827. Introduction to the Hindoostanee Language in Three Parts, Viz. Grammar, Vocabulary and Reading Lessons. Calcutta: The Baptist Mission Press.
- Zhang, Nina Ning. 2010. *Coordination in Syntax*. Cambridge: Cambridge University Press.
- Zoerner, Edward. 1995. *Coordination: The Syntax of &P*. Doctoral dissertation. University of California, Irvine.

Zwart, C. Jan-Wouter. 1997. *Morphosyntax of verb movement: A minimalist approach to the syntax of Dutch*. Dordrecht: Kluwer.

APPENDIX A

Findings from the data collected

As was mentioned in chapter 2 above, the main sources of data used for this thesis were the data collected through surveys with native Hindi speakers, a speech production experiment conducted together with Heidi Lorimor, and the Dainik Jagaran corpus. Besides google search, as well as other online newspapers were also used from time to time.

The Dainik Jagaran corpus was used to identify the types of constructions where CCA was being used. For example, after extracting the relevant coordination constructions, I manually looked at the cases where CCA was used to identify the kinds of verbs with which CCA was possible. This examination resulted in the finding that the CCA was consistently being used with the subjects of the unaccusative verbs, the subjects of the passive verbs or the objects of the transitive verbs, none of these cases involved (clear) unergative verbs. The google search and the online newspapers were used to search for any specific patterns. The preliminary results from the speech production experiment were used to look for the existence of CCA and the mismatches between the agreeing heads. However a further analysis of the production experiment data will be performed to determine if the animacy, gender etc have any effects on CCA vs FA with verbal vs adjectival elements.

The surveys were conducted to identify if the types of NPs or the types of verbs had any role in getting CCA or FA. Surveys were also conducted to test if the intervening elements between the probe and the goal blocked CCA, what types of intervening elements blocked the CCA, if the word order had any effect on getting CCA or FA, if the presence of number sensitive items affected the CCA, if the second conjunct formed a closer unit with the coordination head

“aur” 'and', if the quantifiers in the first conjunct could bind the pronouns in the second conjunct, and if the reverse was true, if the extraposition of the first conjunct, second conjunct, first conjunct with the coordination head, and second conjunct with the coordination head was acceptable etc.

The number of native Hindi speakers who provided the data varied for each of the surveys. Some of the findings from these surveys are presented below. For example, with respect to the types of NPs, I looked for the possibility of CCA with the coordinated phrases where each conjunct consisted of the quantifier “ek” 'one', or a demonstrative such as “yeh” 'this', or a declining adjective such as “niilaa/niilii/niile” 'blue.MSg/blue.F/blue.MPl' etc. Out of the 12 speakers who participated in the survey, 8 accepted CCA when the conjuncts consisted of the adjectives, whereas 4 speakers chose the FA constructions. There was a 50-50% distribution with respect to the coordination phrases consisting of conjuncts with demonstratives. All the speakers chose CCA when the conjuncts consisted of the quantifier “ek” 'one'. Although the number of participants in the survey is small, we tend to see a pattern that the CCA is preferred with the adjectives modifying the conjunct NPs than with the demonstratives, and it seems obligatory with the Sg quantifier “ek” modifying the conjunct NPs. To determine the role of the types of modifiers in the conjuncts on CCA, we would need further data with a larger number of speakers. However, what this set of data helps us understand is the following. In some of the previous literature, it has been argued that only CCA is possible with the object coordinated phrases, the FA is not possible at all. However, most of the examples used to illustrate this consist of the quantifier “ek” modifying the conjuncts. The set of data obtained through this survey explains how the specific type of examples used in the previous literature resulted in the

incorrect conclusions about the possibility of CCA vs FA with the object arguments in Hindi.

The following surveys helped in observing the role of the linear proximity condition in getting the CCA in Hindi. With the bare NPs as conjuncts, I found that the CCA was chosen by 60% of the participants (total number of participants was 5) when there were no intervening adjuncts between the probe and the goal. However, when there were intervening adjuncts, CCA was chosen by 44% of the participants (total number of participants was 18), whereas FA was chosen by 66% of the participants. Further dividing the results with intervening adjuncts into specific categories, I found that 40% of the speakers chose CCA when there were three intervening adjuncts or when a long adjunct (e.g. a relative clause) was used, whereas 60% of the speakers chose FA in such cases.

In another survey, which was used to determine the role of verb types, I found that the speakers (total number of speakers was 4) chose both CCA and FA when the verb used was an unaccusative verb, however only FA was chosen with an unergative verb. Again the number of participants are very small in these surveys, but these have been used just as the indicators of the patterns so as to propose an analysis. In this dissertation, I have attempted to test the proposed analysis based on the predictions it makes with respect to other sets of data, and whether it can explain the facts used in the previous analyses of CCA. However, a future investigation of these patterns with a larger number of speakers would help us further test the analysis proposed here.

APPENDIX B

Previous accounts for clausal vs phrasal coordination as accounts for collective vs distributive reading of the coordinated phrase instead

As I had mentioned in footnote 50 in chapter 4 above, each of the accounts for the clausal coordination vs phrasal coordination proposed by Dik (1968), Dougherty (1970), Hudson (1970) and McCawley (1968) could instead be taken as accounts for distributive reading vs collective reading. Here I briefly mention their accounts and show how they could explain the distributive vs collective readings (within the phrasal coordination).

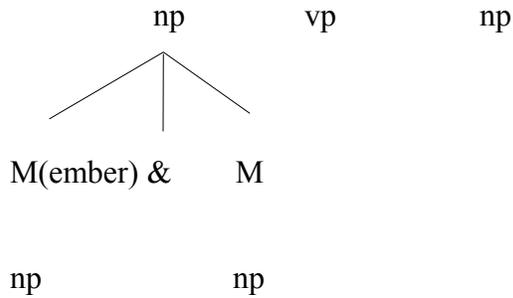
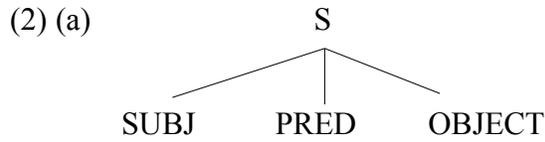
Dik's (1968) analysis is based on a functional model, he treats clausal coordination as a conjunction of functions, and phrasal coordination as a conjunction within a function. For example, he has the structures as in (2) for the sentences in (1). Note (2a) has a single occurrence of SUBJECT (which is the function of a conjunction of noun-phrases), while (2b) has two occurrences of SUBJECT. Thus in (2a), rest of the clause applies to “John and Mary” as a whole, whereas in (2b) it applies to “John” and “Mary” separately.

(1) (a) John and Mary bought a house.

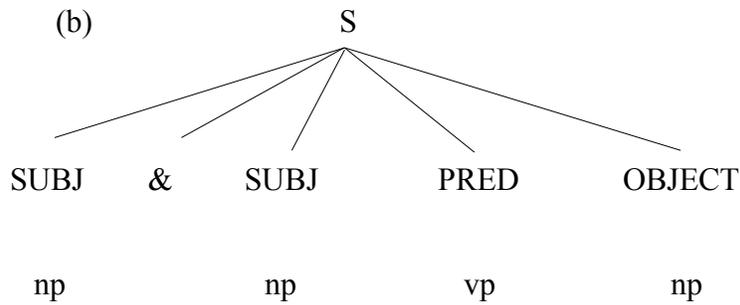
(phrasal: there is one house bought between John and Mary)

(b) John and Mary bought an ice-cream.

(clausal: John and Mary each bought an ice-cream)



John and Mary bought a house



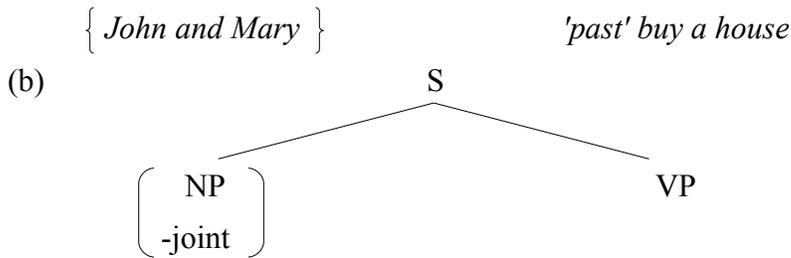
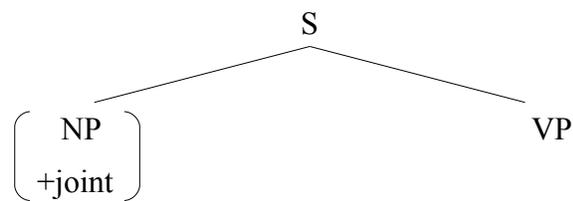
John and Mary bought an ice-cream

Although I do not assume that the structure of coordination is multi-nary (it is assumed to be binary, refer to chapter 3 for details), however it can be seen that if the structure were multi-nary, Dik's analysis simply explains whether we have the collective reading of the noun phrase “John and Mary” or distributive reading based on where the attachments are, whether the nouns “John” and “Mary” attach at the SUBJ, or S level. However, (2a) could be seen as a clear representation for phrasal coordination, (2b) does not represent coordination of two separate clauses here, note Dik (1968) himself also rejected the conjunction reduction hypothesis, that is why rather than

assuming coordination of clauses, he derives the distinction between (1a) and (1b) through coordination of functions.

Hudson (1970) mentions that McCawley (1968) represents the distinction between (1a) and (1b) through the use of a feature [+/-joint] attached to the relevant NP. Thus for McCawley, the structures are as in (3) below. If it is phrasal, [+joint] is attached to the NP, see (3a); if it is clausal, [-joint] is attached to the NP, see (3b).

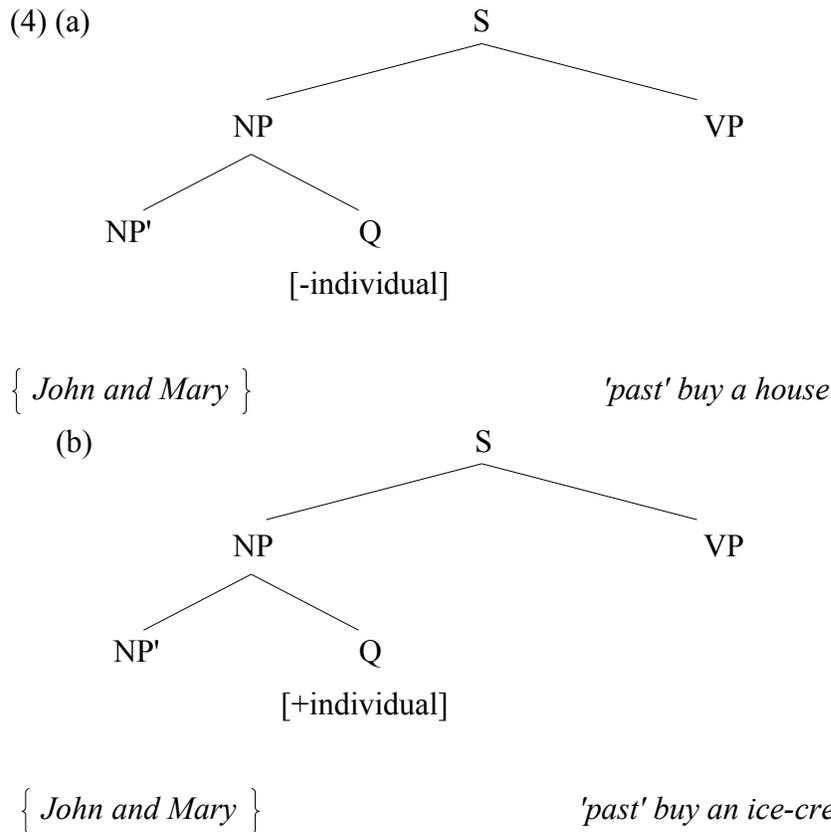
(3) (a)



Again, it seems that the feature attached to the NP instructs the grammar how the NP should be interpreted, i.e. whether it should be interpreted collectively or distributively with respect to the VP within the same clause, rather than providing us a structure for coordination of clauses.

Dougherty (1970, as well as in his previous papers) also has a similar analysis, he assumes syntactic feature [+/-individual] is assigned to a quantifier which is attached to the NP

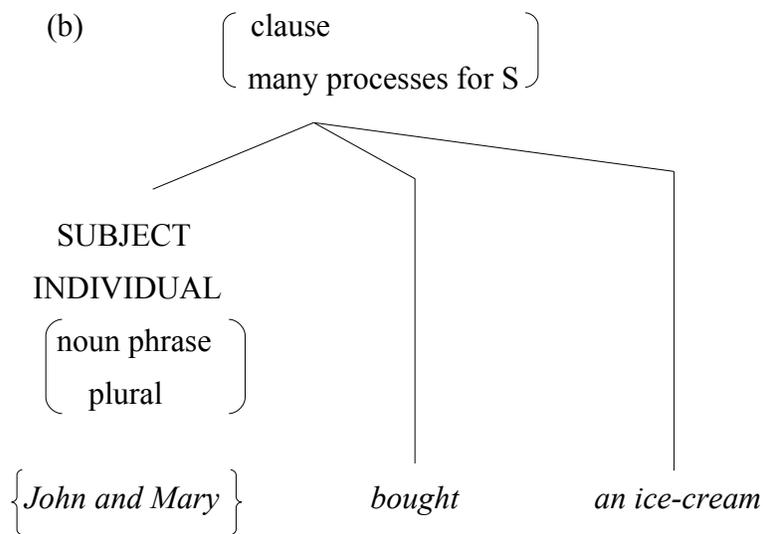
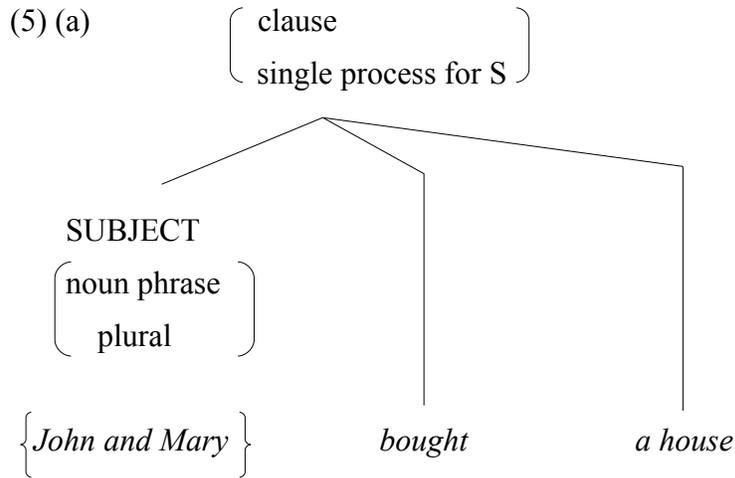
as in (4a-b) below.



As in McCawley (1968) above, in Dougherty (1970, as well as 1968) too, it seems that the feature attached to the NP (through Q) instructs the grammar how the NP should be interpreted, i.e. whether it should be interpreted collectively or distributively with respect to the VP within the same clause, rather than providing us a structure for coordination of clauses.

Hudson (1970) incorporates certain characteristics from the analyses of Dik, McCawley and Dougherty above and provides the structures in (5) below for the sentences in (1). His analysis matches with Dik's analysis in that he also makes use of functions (such as SUBJECT). It matches with McCawley's analysis in that both attach labels (function labels and features) directly to the NP node. It matches with Dougherty's in that in both the analyses,

phrasal coordination is taken as the unmarked structure and clausal coordination as the marked structure.



Here again we see that the marking on the function SUBJECT with the feature [INDIVIDUAL] instructs the grammar whether the noun phrase should be interpreted collectively or distributively (however Hudson additionally marks the clause as involving a single process to denote phrasal coordination or multiple processes to denote clausal coordination).