

**A Lexical Realizational Functional Grammar analysis of long-distance agreement in  
Ojibwe and Hindi-Urdu**

**by**

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## ABSTRACT

The purpose of this thesis is to provide an analysis of the morphosyntactic phenomenon, long-distance agreement (LDA), using the emerging Lexical-Realizational Functional Grammar (LRFG) framework. This project aims to illustrate that LDA requires the application of LRFG to explain the feature distribution that has been interpreted as such. I look at two cases that have been described as LDA in Ojibwe and Hindi-Urdu, and argue that neither operation is LDA. By applying the LRFG framework to cases that have been interpreted as LDA in Ojibwe, I analyze feature mirroring between the matrix verb and embedded clause, and show that this is in fact anaphoric agreement with the topic of the antecedent, that is conditioned by the adjunct. I then apply the same framework to Hindi-Urdu, where I illustrate that this apparent LDA is not occurring with a true embedded clause, and is therefore not cross-clausal. I build on a previous observation of LDA with restructuring verbs by Bhatt (2005), and show that these cases of alleged LDA can only occur with restructuring verbs that take an infinitive as their complements. The restructuring verb creates a complex predicate, and follows the rules of simple agreement. In this thesis, I present biographical data alongside previous analyses of LDA, in Ojibwe and Hindi-Urdu. I then apply the LRFG framework to give my own analysis of ostensible LDA. I provide analyses to support my arguments for anaphoric (Ojibwe) and local infinitival agreement (Hindi-Urdu), as well as suggestions for future research where LRFG could be advantageous.

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## 1. INTRODUCTION

Long-distance agreement (LDA) is a morphosyntactic phenomenon in languages, by which agreement occurs across clausal boundaries (Börjesson & Müller, 2017). LDA occurs in many languages, from many different language families. It has been subject to many analyses, through different grammatical frameworks. Proposals for LDA vary based on framework, and language. Some argue that LDA is the result of an unbounded dependency (Branigan and Mackenzie, 2002; Bošcović, 2007; Bruening, 2009; Fry and Hamilton, 2013; Lesourd, 2010; Polinsky and Potsdam, 2007) while others opt for a prothetic argument (Dahlstrom, 2013; Davies, 2005).

LRFG is a new, constraint-based theory of grammatical architecture. It combines the morphological realization of Distributed Morphology (DM; Halle & Marantz, 1993) with the syntactic structure and correspondence architecture of Lexical-Functional Grammar (LFG; Kaplan and Bresnan, 1982). This benefits analyses of non-configurational languages and complex morphological processes, with its in-depth representation on both the structural and semantic levels.

In some Lexicalist approaches to LDA, there is no account for the individual morphological structure. In a Minimalist approach, movement is required to obtain proper surface forms of agreement. LRFG marries DM and LFG to create a framework that utilises agreement templates and their relations to the f-structure, and brings forth tools from both parties to illustrate complex morphological processes.

This paper aims to address the existence of LDA in Ojibwe and Hindi-Urdu, by deploying the LRFG framework. I argue that LRFG gives us insights into familiar agreement phenomena, and that both processes that are considered “LDA” in Ojibwe and Hindi-Urdu, are

not LDA, or the same mechanism. I argue that LDA in Ojibwe is anaphoric agreement with the topic of the adjunct clause, while LDA in Hindi-Urdu the agreement is not occurring with a true embedded clause. Instead, there is simple agreement with a complex predicate, created by a restructuring verb.

This thesis is organized as follows. Section 2 overviews the relevant biographical data and morphological structures in Ojibwe, then presents two previous analyses for LDA in the Algonquian languages. Section 3 provides biographical information and patterns of simple agreement in Hindi-Urdu, followed by two analyses of LDA in the language. Section 4 overviews LRFG, which I then apply to documented cases of so-called LDA in Ojibwe and Hindi-Urdu in Section 5. Section 6 offers empirical extensions and conclusions for this analysis.

## 2.0 BACKGROUND: OJIBWE

Section 2 presents biographical data for the Algonquian language family and Ojibwe, and standard agreement in Ojibwe. It then delves into the three possible types of LDA in the Algonquian languages, and then explores previous analyses for these instances of LDA. Some argue that LDA is the result of agreement with a prothetic argument (Dahlstrom, 2013; Davies, 2005) while others argue for movement (Branigan and Mackenzie, 2002; Bošcović, 2007; Bruening, 2009; Fry and Hamilton, 2013; Lesourd, 2010; Polinsky and Potsdam, 2007).

## 2.1 BIOGRAPHICAL INFORMATION

### 2.1.1 THE ALGONQUIAN LANGUAGE FAMILY

The Algonquian language family (Glottolog code: algo1257) is composed of approximately 30 languages, which can be subdivided into three main groups: Plains, Central

and Eastern. There are other divisions that can be made among these groups, but they are based on sub-dialects of particular languages (“The Algonquian Language Family”, 2017). The better-known languages in this family include: Anishinaabemowin (which is known by a variety of names), Cree, Mi’gmaq and Blackfoot (“The Algonquian Language Family”, 2017).

The total number of speakers of Algonquian languages is difficult to find, but it is recognised that it is a relatively low number. For example, as of 2006, there were only 2680 documented speakers of Algonquin, with less than 10% of those speakers being monolingual (“The Algonquian Language Family”, 2017).

The Algonquian languages are spoken in “Canada, New England, the Atlantic coastal region southward to North Carolina, and the Great Lakes region and surrounding areas west of the Rocky Mountains (“The Algonquian Language Family”, 2017)”.

### 2.1.2 OJIBWE

Ojibwe (Glottolog code: ojib1241) is the language of the Anishinaabe nation, and belongs to the Algonquian language family. It is known by many names, including: Ojibwe, Ojibwa, Ojibway, Otchipwe, Ojibwemowin, and Anishinaabemowin (“Ojibwa”, n.d.). For consistency, I will be referring to this language as Ojibwe, for the remainder of this paper.

Ojibwe is an indigenous language of North America, and was spoken by approximately 50,000 speakers, as of a 2016 census (“Anishinaabemowin language” n.d.). In Canada, it is spoken from southwestern Quebec, through Ontario, Manitoba and parts of Saskatchewan, with other outlying communities in Alberta (“Ojibwa”, n.d.). In the United States, it is spoken in parts of Michigan, Wisconsin, Minnesota, North Dakota and Montana (“Ojibwa”, n.d.). There are also a number of dialects of this language, some of which are Algonquin, Eastern Ojibwe, Odawa, and Chippewa (“Ojibwa”, n.d.).

## 2.2 MORPHOLOGY

This portion of Section 2 explains the importance of the animacy hierarchy in Ojibwe agreement, and provides a template for standard agreement. This template will be used throughout this paper.

### 2.2.1 THE PERSON HIERARCHY

In Algonquian languages, a person- or animacy-hierarchy determines which participant in a clause is of the most “importance”. This does not necessarily impact the  $\theta$ -roles assigned to the participants. However, it does influence verbal-morphology that shows us how each party is contributing to the action or situation.

The ordering of the person hierarchy (from most to least important) is as follows:

- a. Second person, 2
- b. First person, 1
- c. Third person (proximate), 3
- d. Third person (obviative), 3'
- e. Inanimate objects

Languages that have a person hierarchy also use a different grammar for transitive predications, known as a direct-inverse system (Fry and Hamilton, 2014). In (1a) (Fry & Hamilton, 2014), direct carries the “standard” order, where the AGENT (or subject) outranks the PATIENT (or object) in the person hierarchy. This is reflected in agreement patterns as well. In the inverse (1b), the opposite occurs. Because the PATIENT outranks the AGENT in the person hierarchy, agreement from the verb appears on the opposite role.

- (1)
- a. n-waabm-aa  
1-see-DIR  
'I see him/her.'
  - b. n-waabm-ig  
I-see-INV  
'He/she sees me.'

### 2.2.2 STANDARD AGREEMENT IN OJIBWE

Like other languages in the Algonquian family, Ojibwe is considered to have a relatively “free” word order (Valentine, 2001). There are many possible orders that can be used, due to complex morphological systems of agreement. Some studies have shown preferred word orders, based on context. Alternatively, this word-order can be defined as, “discourse configurational” (Oxford, 2020).

Standard Ojibwe agreement contains mostly suffixal morphology (Oxford, 2020), and follows two orders, conditioned by the clause type. There is the “independent” order, which is usually used in main clauses, and the “conjunct” order, which is usually used in embedded clauses. These two types of agreement are not restricted to either clause type, but generally work with each of their respective groups (Oxford, 2020). There is somewhat different morphology, depending on which order something appears in. This difference in morphology can be seen in the two examples of ‘*you see her*’. In (2a) (independent), there is the bipartite 2PL affix. In (2b), the 2PL agreement exists as an inflectional suffix (Oxford, 2020).

(2) (Plains Cree; Wolfhart, 1973)

- a. kiwa:pama:wa:w  
ki-wa:pam:-a: -wa:w  
2- see:TA -3OBJ-2PL  
‘you see her’ (2 →3)
- b. wa:pama:ye:k  
wa:pam -a: -ye:k  
see.TA -3OBJ-2PL  
‘you see her’ (2 →3)

In (3) is the general form of the matrix and conjunct in Ojibwe. In this, the conjunct takes the form of an embedded clause.

(3) [ CONJUNCT ]

PREFIX (PERSON)	STEM	THEME SIGN (VOICE)	(NEG)	PRONOUN PL. (CENTRAL SUFFIX)	MOD	NOMINAL (PERIPHERAL SUFFIX)	STEM	THEME SIGN (VOICE)	(NEG)	LOCAL P & #	NON-LOCAL P & #
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Ojibwe verbs, which are almost always minimally bipartite, account for the prefix and central suffix (Oxford, 2020). There are two types of verbs, TA and TI. TA verbs have animate goals, while TI verbs have inanimate ones (Oxford, 2020). In the conjunct, the theme sign would appear on both types of verbs, where the central suffix appears on all verb forms (Oxford, 2020). Additionally, “a transitive verb normally agrees with its own subject and object, but for an embedding verb, it’s also possible for the “object” to be an argument in the embedded clause (Oxford, 2020).” In the matrix clause, there are three sets of possible outcomes for the central suffix, all of which are conditioned by the person prefix (Oxford, 2020). Hierarchy effects in the direct-inverse system also affect the independent and conjunct morphology. For example, in the direct, the theme sign/voice would indicate the object, but not in the inverse (Oxford, 2020).

### 2.2.2 LDA IN ALGONQUIAN LANGUAGES

There are three main types of LDA that have been explored in the Algonquian language family, two of which are restricted. The two restricted types are “Agent” and “Highest-rank” LDA. The third, unrestricted type is “Free” LDA, and is the most common (Fry and Hamilton, 2014).

Both Agent and Highest-rank LDA have singular options for the agreement. In Agent LDA, the agreement occurs with the embedded agent of the subordinate clause. This occurs in both the direct and inverse (Fry and Hamilton, 2014).

(4) Plains Cree (Dahlstrom, 1991)

- a. ni-kiskeeyim-aaw [George ee-saakih-aa-t  
1-know-VTA-DIR.1>3[George CONJ-love,VTA-DIR-3  
o-kosis-a ]  
3.POSS-son-OBV]  
'I know that George loves his sons.'

In (4), the agent, *George*, is indexed by the third person *-aaw*.

In Highest-rank LDA, agreement occurs with the embedded agent if the clause is in the direct, but the patient if it is in the inverse.

(5) Mi'gmaq (Fry & Hamilton, 2014)

- a. geji-g [Mali ges-al-a-j-i Piel-al aq  
know.VTA-3 [Mary love-VTA-3OBJ-3-3.PL Peter-OBV COOOR  
Je-g-al ]  
Jack-OBV]  
'I know that Mary loves Peter and Jack.'

- b. geji-g [Mali ges-al-gwi'-tit-l Piel-al aq  
know.VTA-3 [Mary love-VTA-INV-4OBV Peter-OBV COOOR  
je'gal ]  
Jack-OBV]  
'I know that Peter and Jack love Mary.'

In (5a), the matrix verb indexes a third person patient, which is the embedded agent *Mali* (Fry and Hamilton, 2014). In (5b), the inverse, *Mali* becomes the embedded patient, but the matrix clause still agrees with it.

Free LDA is the most common form of LDA in the Algonquian language family, with three possible outcomes for agreement between the matrix and the subordinate clause: the embedded subject, the embedded object, or the entire clause. Following the agreement template (3), the examples in (6) show the different outputs of Free LDA for the statement, ‘I know that you shot him’.

[ CONJUNCT ]											
PREFIX	STEM	THEME SIGN	(NEG)	PRONOUN PL.	MOD	NOMINAL	STEM	THEME SIGN	(NEG)	LOCAL P & #	NON-LOCAL P & #
(PERSON)		(VOICE)		(CENTRAL SUFFIX)		(PERIPHERAL SUFFIX)		(VOICE)			

(6) a. LDA embedded SUBJ

gi-      giken-im.    -in            [gii-baashkizw-aa      -d]  
 2-      know            -VTA-1>2    [PST-shoot-DIR-2(CONJ)]

‘I know that you shot him.’

b. LDA embedded OBJ

ni-      giken-im    -aa            [gii-baashkizw-aa      -d]  
 1-      know            -VTA-1>3    [PST-shoot-DIR-2(CONJ)]

‘I know that you shot him.’

In (6a), *-in* shows agreement with the embedded subject, while in (6b), *-aa* shows agreement with the embedded object. The third option, which is not illustrated in (6), is a 3.IN marking on the verb of the matrix clause, which would indicate agreement with the entire subordinate clause.

### 2.3 PROTHETIC ARGUMENT APPROACHES TO LDA

In syntax, a prothetic argument is one that exists in the matrix clause, and acts as a co-referent to an argument in the complement clause (Branigan and Mackenzie, 2002). In both

related, and unrelated languages to Ojibwe, there have been arguments for this type of argument that gives rise to certain agreement patterns.

### 2.3.1 DAHLSTROM (1995)

Dahlstrom begins her paper by outlining basic agreement and word order in the Algonquian languages. Importantly, she notes that the NP argument appears both before and after the verb in two parts. She focusses on the language Fox, and argues that a co-referent exists in  $\bar{A}$ -position, so that LDA is actually local clause-bounded agreement with a prothetic object that is coreferential with an argument, specifically the topic, in a complement clause (Branigan and Mackenzie, 2002). She argues three points for determining topics:

1. If a negative particle is present, it will appear after a topic.
2. A topic can, but does not need to correspond to a prothetic argument or resumptive pronoun.
3. Topics are the leftmost arguments in a sentence.

Looking at (7a), the negative element exists after the topic, *I*. In (7b), 'Paul' is with the leftmost element.

(7) Fox (Dahlstrom, 1993) and Plains Cree (Dahlstrom, 1991)

a. ni.na=ke.hi [a.kwi ke.ko=hi ašenokini]  
I-and not anything disappear 0/neg  
'As for me, nothing is missing.'

b. Pûn tshit-itenim-ik<sup>u</sup> uâpâtinî-epan Mânîua.  
Paul 2-thinks-3/INV saw-3 Marie  
'Paul thinks you saw Marie.'

In (7b), it appears as if the matrix verb is referencing a 2SG complement, which Dahlstrom interprets as a prothetic argument. Dahlstrom argues that an argument like this would be necessary in this type of structure, and would be co-referencing the topic (Dahlstrom, 1995).

### 2.3.2 DAVIES (2005)

Davies (2005) explores the grammatical properties of Madurese, an Austronesian language. He argues that an argument of a matrix clause is co-referencing as an object in the embedded clause. This is based on a previous analysis of an agreement phenomenon called, “Prolepsis” (Higgins, 1981). Although this is not an explicit form of LDA, it bears the same implications. Davies illustrates that a predicate may take a clausal complement. He bases his analysis in a comparison of English to Madurese constructions, using verbs such as *forget*, *promise* and *regret*.

(8) Madurese (Davies, 2005)

- a. Ali a-janji-agi labang-nga ka Siti la e-pa-becce'-a  
AV-promise-BV door-DEF to S already OV-CS-good-IRR  
are Sennen  
day Monday  
'Ali promised Siti that the door would be fixed by Monday.'

In (8), Davies states that the nonthematic object, *kabarragi* ‘promise’, in the matrix clause foresees a referent of that same object in the embedded clause (Davies, 2005).

## 2.4 MOVEMENT APPROACHES TO LDA

### 2.4.1 BRANIGAN AND MACKENZIE (2002)

Branigan and Mackenzie (2002) analyze LDA in Innu-aimûn (Algonquian), spoken in Northeastern Canada (Branigan and Mackenzie, 2002). They refer to LDA as cross-clausal agreement (CCA)<sup>1</sup>. They argue that LDA is true CCA, where a matrix verb agrees with an

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<sup>1</sup> Although Branigan and Mackenzie (2002) refer to this process as “cross-clausal agreement (CCA)”, I will continue to refer to this process as LDA, for consistency with the other sources and my own project.

argument in the complement. This argument would be the Topic for agreement (Branigan and Mackenzie, 2002).

The authors reject previous prothetic approaches (Dahlstrom, 1995), and state that LDA in Innu-aimûn is true LDA. They state that a prothetic argument approach will present an issue with the relationship between the matrix object and the embedded argument (Branigan & Mackenzie, 2002). They state that this would place the full DP in the embedded clause, which violates Principle C<sup>2</sup>. Therefore, licensing cannot occur.

Branigan and Mackenzie present two movement hypotheses, “The Case/agreement hypothesis” and “The  $\bar{A}$ -agreement hypothesis”. The propositions for the hypotheses are as follows (Branigan and Mackenzie, 2002).

(9)

The Case/agreement hypothesis	The $\bar{A}$ -agreement hypothesis
a. The goal of LDA has an unchecked Case feature.	a. The goal of LDA has an unchecked $\bar{A}$ -feature
b. The goal of LDA is the highest DP in the complement clause	b. The goal of LDA need not be the highest DP in the complement clause.
c. The complement clause in CCA is not a CP.	The complement clause in CCA may be a CP.

They immediately reject The Case/agreement hypothesis, and state that each of the claims are false, and assume the  $\bar{A}$ -agreement hypothesis. By using a *wh*-phrase, the authors show that each of the conditions in the  $\bar{A}$ -agreement hypothesis are met in cases of CCA.

(10) Algonquian (Branigan and Mackenzie, 2002)

- a. Tshi-thissenim-âu-â auen ka-pâpítaka?  
 2-know-3-Q            who is laughing  
 ‘Do you know who is laughing?’

---

<sup>2</sup> Principle C, of Binding Theory, states that an R-expression must be bound (Carnie, 2021)

In (10), the matrix verb agrees with the interrogative pronoun, and agreement can take place between the matrix verb and the goal (Branigan and Mackenzie, 2002). They state that the goal has been moved out of the matrix clause into a higher position via A-movement, and is now an accessible target for agreement.

The concluding points are that the object agreement morphology of Innu-aimûn transitive verbs has two jobs (Branigan & Mackenzie, 2002)", being that:

- a. Topic interpretation effect reflects (covert) A-movement that produces a complement clause with an accessible target for agreement at the left periphery
- b. Pronoun in a higher clause is coindexed with an NP in the lower clause.

(Branigan & Mackenzie, 2002)

They state that A-movement is the only way to create CCA without violating binding principles, and that other approaches, including the prothetic argument hypothesis, cannot satisfy all conditions.

#### 2.4.4 FRY AND HAMILTON (2014)

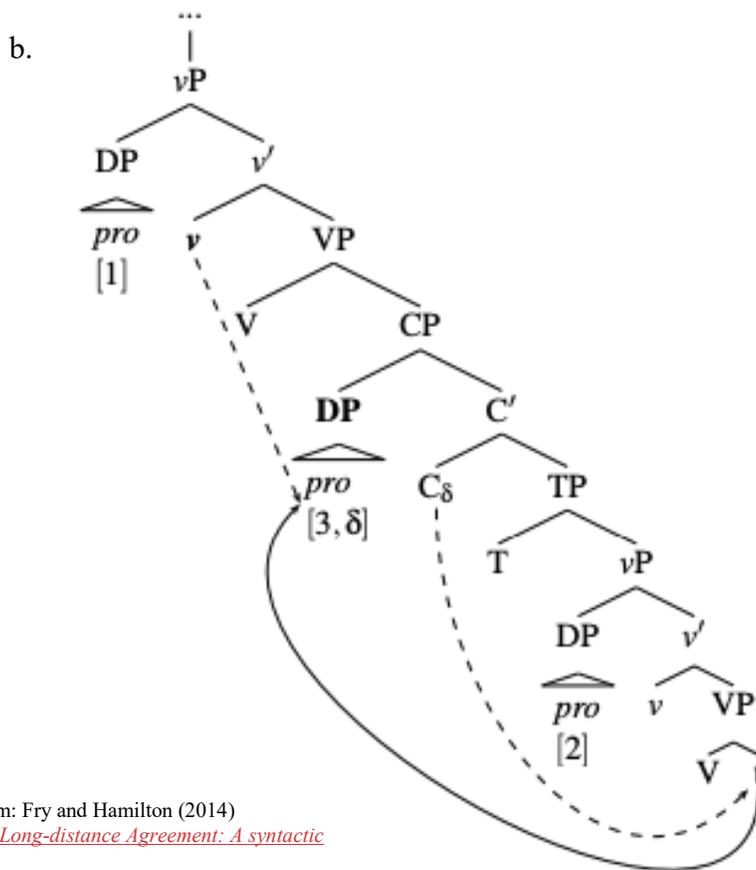
Fry and Hamilton use LDA as a diagnostic tool for the different syntactic variations among the Algonquian languages. They begin their paper by outlining the direct and inverse systems. Recall the inverse form refers to those where the thematic patient outranks the agent, with regard to the person hierarchy.

As stated in Section 2.2.2, Fry and Hamilton categorize LDA into three separate modes. These are: "Free LDA", "Agent LDA" and "Highest-rank LDA" (Fry and Hamilton, 2014). Both Agent and Highest-rank LDA fall under the category of "Restricted" LDA, meaning that there

are specifications for the way that these types of LDA work, and restrictions on when they can apply. Each type of LDA occurs in a subset of Algonquian languages, but not all of them.<sup>3</sup>

Fry and Hamilton define Free LDA as agreement occurring with whichever argument in the embedded clause enters the phrase with a specific feature. Fry and Hamilton refer to this special feature as both a “C-feature” and a delta-feature. This agreement occurs because the embedded declarative has that C feature. This agrees with and attracts DPs to Spec-CP, and from here the matrix verb then agrees with the DP in the embedded CP. Below is an example of direct voice.

- (11) a. ni-giken-im-aa [gii-baashkizw-aa-d ]  
 1-know-VTA-1>3 [PST-shoot-DIR-2(CONJ)]  
 ‘I know that you shot him.’



Sourced from: Fry and Hamilton (2014)  
[Algonquian Long-distance Agreement: A syntactic account](#)

<sup>3</sup> Please note that the tree-diagrams are cut-off, and only include the relevant portions showing LDA.

The corresponding sentence for full tree is ‘*I know that you shot him*’, in Algonquian, from (11a). In (11b), the delta-feature attracts the DP object from the complement of V into spec-CP. The matrix verb in (11a) has a suffix which indexes agreement with the animate patient (*-im*) (Fry and Hamilton, 2014). The embedded clause remains unchanged, as well. Moving to the inverse, LDA can target either the agent or patient in the embedded inverse clause.

- (12) a. ni-giken-im-aa [gii-baashkizaw-i(n)-k ]  
 1-know-VTA-1>3 [PST-shoot-INV-3(CONJ)]  
 ‘I know that he shot you.’
- b. gi-giken-im-ig [gii- baashkizw-in-aan ]  
 2-know-VTA-3>2 [PST-shoot-INV-OBV(CONJ)]  
 ‘He knows that I shot you.’

Both of these embedded clauses are in the inverse. The matrix verb shows agreement with the embedded third-person agent (12a), and the embedded patient (12b). As stated previously, the authors group both Agent and Highest-Rank LDA into what they call a “restricted pattern” (Fry and Hamilton, 2014). Therefore, these two forms of LDA must occur with specific parameters.

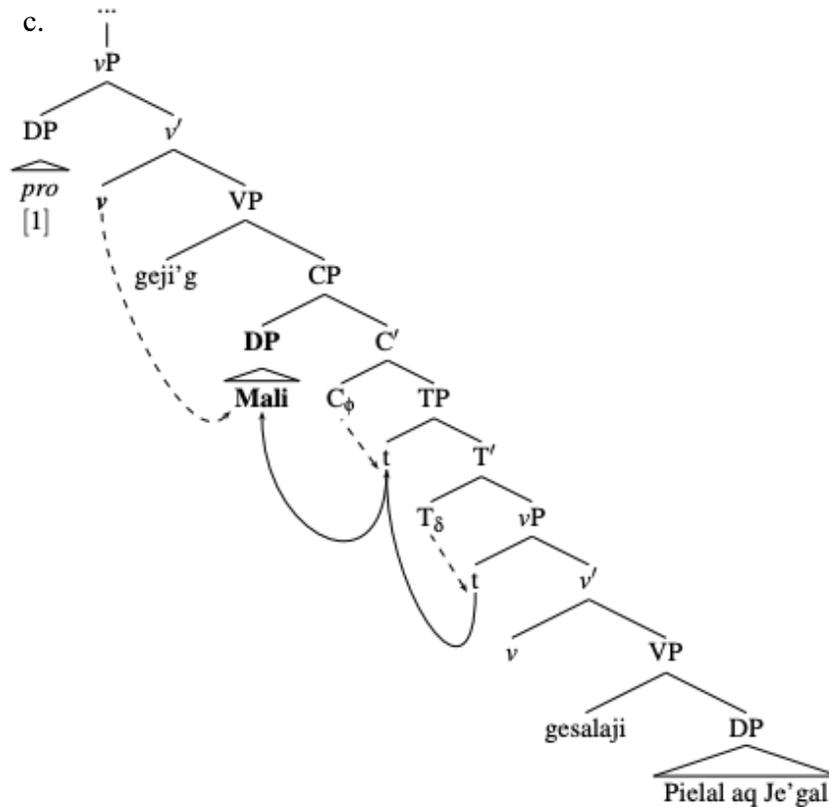
As implied by its name, only the embedded agent argument can undergo Agent LDA. Agent LDA suggests that agent DPs are placed higher than patient DPs in the tree structure. In the direct, Fry and Hamilton state that the agent is the only possible goal, as the embedded agent is always more “accessible” than the embedded patient. This is regardless of the features it possesses. In (13) from Plains Cree, both agent and patient forms are present, with identical embedded clauses.

- (13) a. ni-kiskeeyim-aaw [George ee-saakih-aa-t  
 1-know-VTA-DIR.1>3[George CONJ-love,VTA-DIR-3  
 o-kosis-a ]  
 3.POSS-son-OBV]  
 ‘I know that George loves his sons.’

b. \* ni-kiskeeyim-im-aawa [George ee-saakih-aa-t o-kosis-a]  
 1-know-VTA-OBV-DIR.1>4[George CONJ-love 3.POSS-son-OBV]  
 ‘I know that George loves his sons.’

(13a) produces a grammatical sentence, while (13b) does not, due to the ungrammatical LDA with the embedded patient (Fry and Hamilton, 2014).

Like in Free LDA, the embedded, declarative C will agree and attract (13c).



Sourced from: Fry and Hamilton (2014)  
[\*Algonquian Long-distance Agreement: A syntactic account\*](#)

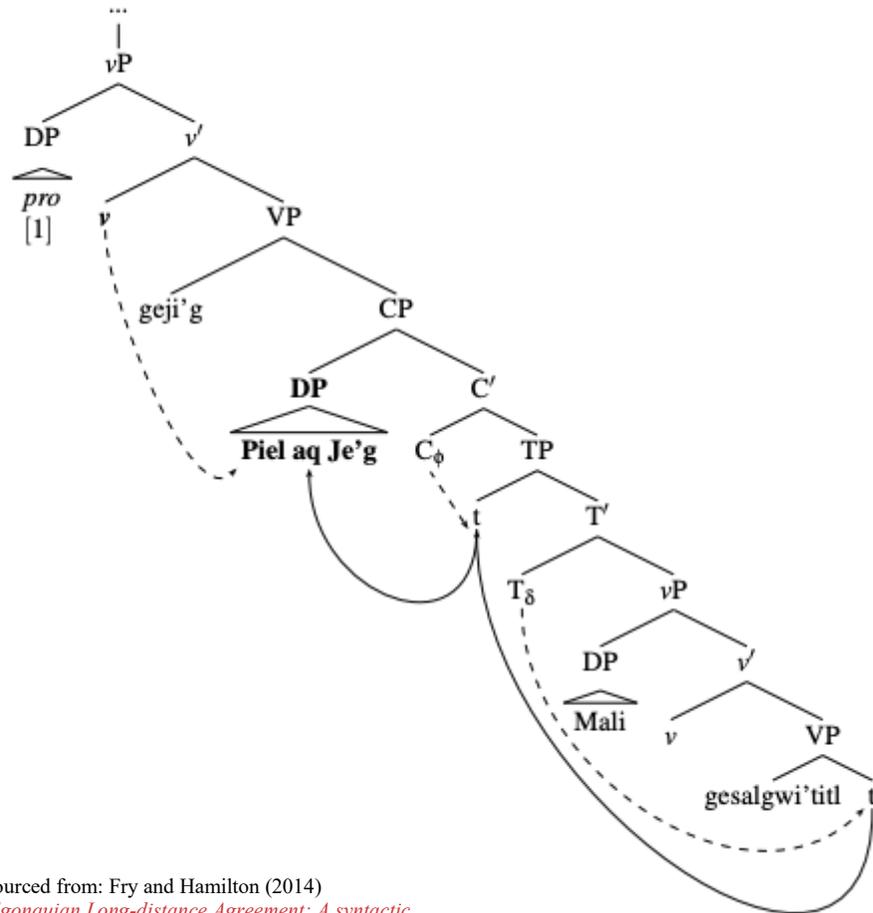
The sentence here is, ‘I know that Mali loves Peter and Jack’, in Mi’gmaq.

In Agent LDA, LDA is limited to the embedded agents in the direct, and patients in the inverse (Fry and Hamilton, 2014). Recall the ungrammaticality of (5b) versus (5a). The

ungrammatical form is caused by the inability of the matrix verb to index a third person, plural patient (Fry and Hamilton, 2014).

As stated in the morphological review, Highest-Rank LDA utilises the person-hierarchy. With Highest-Rank LDA, the patient garners agreement. In the inverse, it is the highest-ranking element in the person hierarchy, and is structurally higher than the embedded agent, which attracts it to and agrees with the corresponding phi-feature. If we compare the examples in (5) to the tree below, the inverse morpheme is now in the embedded clause. Because of this, the grammatical roles change.

(14) a.



Sourced from: Fry and Hamilton (2014)  
[\*Algonquian Long-distance Agreement: A syntactic account\*](#)

(14a) maps, ‘*I know that Peter and Jack are loved by Mary*’. Because *Mary* is ranked lower than *Peter and Jack*, as well as structurally lower, the agreement occurs with *Peter and Jack*.

Fry and Hamilton use these three types of LDA to build on a different morphosyntactic argument in their paper. This will not be discussed in this chapter, as it does not pertain to my focus on LDA. It’s also important to note that the three types are not consciously chosen by Algonquian language speakers, instead it seems to vary in its occurrence in different languages.

#### 2.4.6 POLINSKY AND POTSDAM (2007)

Polinsky and Potsdam (2006) present a pattern of LDA in Tsez, a Nakh-Daghestanian language that is spoken in the Caucasus. The authors present an argument against previous analyses that they deem, “very-local (Polinsky and Potsdam, 2007).” This analysis provides an alternative approach to LDA that resembles head-government, and uses a minimalist framework. They also argue that the trigger of LDA must be a topic.

“In Tsez, verbs agree with the absolutive argument in noun class (I-V) (Polinsky and Potsdam, 2007)”. The verbs that take a clausal absolutive argument show two agreement patterns, one is local agreement (called Proper Local Agreement; PLA, by the authors), and the other is LDA. In (15a) is an example of PLA. (15b) presents an example of LDA in Tsez.

#### (15) Tzes (Polinsky and Potsdam, 2007)

a. enir [užā magalu bāc’ruḷi] r-iyxo  
mother [boy.bread.III.ABS ate].IV IV-know  
‘The mother knows [the boy ate the bread].’

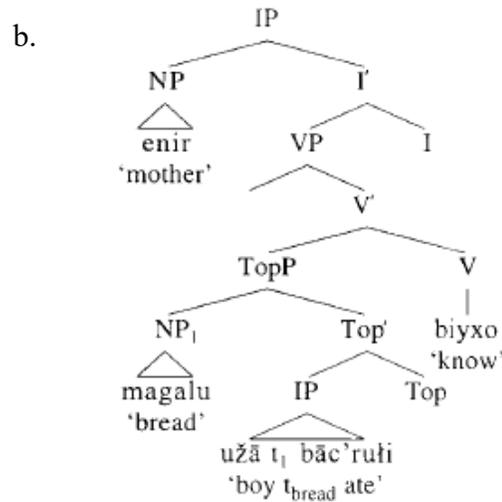
b. enir [užā magalu bāc’ruḷi] b-iyxo  
mother [boy.bread.III.ABS ate] III-know  
‘The mother knows [the boy ate the bread].’

In (15b), the verb agrees with an argument in the argument clause with absolutive case. The authors state that these two types of agreement occur in complementary distribution (Polinsky and Potsdam, 2007).

The authors' analysis has two main conclusions. The first, is that an inflection phrase (IP) may be dominated by a TopicP. The second, is that there is covert LF Topicalization (Polinsky and Potsdam, 2007).

(16) Tsez (Polinsky and Potsdam, 2007)

- a. enir [už-ā magalu b-āc'-ru-li] r-iyxo  
 mother [boy.bread.III.ABS III-eat-PSTPRT.NMLZ] III-know-PRES  
 'The mother knows [the boy ate the bread].'



In (16a) LDA arises when there is movement from the embedded absolutive argument, *magulu* 'bread', to the specifier of TopP. This  $\bar{A}$ -topic position is in a local agreement configuration with the verb (Polinsky and Potsdam, 2007). The topicalization is the trigger for LDA, as it is the argument that shows inflection. The authors conclude that syntactic agreement

allows for less local configuration, in which the target of LDA is conditioning the agreement trigger (TopP) (Polinsky and Potsdam, 2007).

### 3.0 BACKGROUND: HINDI-URDU

This section explores the biographical data, standard agreement patterns, and analyses for LDA in Hindi-Urdu. It focusses on two prominent theoretical accounts, that argue for two distinct motivations for LDA.

#### 3.1 BIOGRAPHICAL INFORMATION

Hindi (Glottolog code: hind1269), Urdu (Glottolog code: urdu1245), Hindi-Urdu and Hindustani (Glottolog code: hind1270) are all names for a language belonging to the Indo-Iranian family, of the Indo-European language family (“Hindi-Urdu”, n.d.). There is some controversy as to whether these titles refer to a single, or multiple languages. In the case of Hindi versus Urdu, the difference may be attributed to the distinct writing systems. Both share a very similar syntax and grammar (“Hindi-Urdu”, n.d.). The language(s) are spoken across India, by approximately 322 million L1 speakers, as of 2011 (“Hindi-Urdu”, n.d.). Hindi-Urdu is a language that undergoes optional LDA. This will be explored later in the paper. <sup>4</sup>

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<sup>4</sup> I would like to note that Butt’s 1993 paper, which is the first theoretical analysis discussed in this section, refers to Hindi and Urdu as separate languages, and discusses “Urdu” in the analysis. In my summary of her findings, I will be using “Hindi-Urdu”, for consistency with the other analyses, and my own arguments.

### 3.2 STANDARD AGREEMENT IN HINDI-URDU

In Hindi-Urdu, the verb must agree with the highest nominative argument. This constraint results in three possible outcomes with clausal agreement (Butt, 1993).

- 1) Since a verb can only agree with one of its nominative arguments, it selects the highest nominative.

(17) Hindi-Urdu (Butt, 1991)

a. naadyaa-ne    xat                    lik<sup>h</sup>-aa            hai  
Nadya.(F)-Erg letter.(M)-Nom write-Perf.M.SG. is  
'Nadya has written a letter.'

In this example, the subject has ergative Case, and it cannot agree with the verb. The verb then agrees with the object, which is the highest nominative in the clause.

- 2) If both the subject and object are nominative, the verb agrees with the subject

(18) Hindi-Urdu (Butt, 1991)

a. naadyaa            xat                    lik<sup>h</sup>-tii            hai  
Nadya.(F)-Nom letter.(M)-Nom write.Impf.F.SG. is  
'Nadya writes a letter.'

Where the subject is nominative and feminine, and the object is nominative and masculine, the verb agrees with the subject, *Naadyaa*.

- 3) If there is no nominative argument, the verb carries the default inflection, which is singular and masculine (and is *-aa*)

(19) Hindi-Urdu (Butt, 1991)

a. naadyaa-ne    cittii-ko    lik<sup>h</sup>-aa            hai  
Nadya.(F)-Erg note.F-Acc write.Perf.M.SG. is  
'Nadya has written (a particular) note.'

In this example, neither argument is nominative, therefore the verb agrees with neither. Instead, it carries the default, singular masculine inflection, *-aa*.

In Hindi-Urdu, nominative Case is the only one that is phonologically null, meaning nothing is pronounced. It is also a “direct” Case, which only appears on subjects and objects.

### 3.3 LDA IN HINDI URDU

LDA in Hindi-Urdu is optional. Unlike Ojibwe, the presence, or lack thereof, of this agreement does not affect the grammaticality of the clause. Seen in (20), two grammatical statements are produced, one (a) that has LDA with the accusative object, and the other (b) that does not.

(20) Hindi-Urdu (Butt, 1991)

- a. Nominative subject, Accusative object, both non-overtly case-marked  
Rahul kitaab parh-taa thaa  
Rahul.M book.F read-Hab.MSg be.Pst.MSg  
'Rahul used to read (a/the) book.'
- b. Ergative subject, Accusative object, only object is non-overtly case marked  
Rahul-ne kitaab parh-ii thii  
Rahul-Erg book.F read-Pfv.F be.Pst.FSg  
'Rahul had read the book.'

Some authors have noted that the optionality of LDA may cause a difference in specificity, which is seen in the final glosses. In any case, the LDA itself remains optional (Bhatt, 2005).

Miriam Butt’s “A Reanalysis of Long Distance Agreement in Urdu” will be discussed in the next part of this paper. It provides more complicated instances of LDA, that delve further into its optionality in Hindi-Urdu. Butt uses these as a basis for her analysis. For this reason, I have

not included them in this particular part, as its purpose is to simply establish that LDA is optional in Hindi-Urdu.

### 3.4 ANALYSES OF LDA IN HINDI-URDU

The following section describes two theoretical accounts for LDA in Hindi-Urdu. One (Butt, 1993), argues that LDA follows patterns of simple agreement, and that the embedded constituents are analyzed as NPs. In the second analysis, Bhatt (2005) argues for a new process, “AGREE”, using previously known facts of LDA, and examples of anaphoric agreement, and restructuring.

#### 3.4.1 BUTT (1993)

Miriam Butt’s analysis of LDA in Hindi-Urdu applies the architecture of LFG. Butt proposes that infinitive constituents be analyzed as NPs, which allows LDA to follow the patterns of simple agreement in Hindi-Urdu (Butt, 1993).

Butt begins by establishing previously known facts and questions about Hindi-Urdu. She notes that Hindi-Urdu’s agreement poses problems for theories of syntax that assume agreement is something that is characteristic of subjects (Butt, 1993). This creates the need to explain LDA in terms of local agreement, but also the need to analyze local agreement itself.

Butt builds on previous papers by Mahajan (1990), and Davison (1991). Mahajan states that as perfect participles and psych verbs have ergative and dative subjects that are overtly Case marked, it is primarily in these constructions that agreement with a nominative object is possible. This takes perfect participles and psych verbs to be non-Case assigning verbs. Objects of non-Case assigning verbs must move to spec of Agr, in order to receive structural Case (Mahajan, 1990). Mahajan also arrives at the generalization that verbs can only agree with NPs not overtly

marked with a Case clitic. This optionality of Case assignment is primarily designed to account for the optionality of LDA (Butt, 1993). However, Butt does not completely agree with this approach. Butt states that this is because assuming that the psych verbs and perfective participles are non-Case assigning, and the infinitives are optionally non Case assigning is a "big leap". She does acknowledge that it accounts for agreement being only a local phenomenon (Butt, 1993).

In another previous approach, by Davison (1991), infinitives are analyzed as CP arguments of the matrix verb (Butt, 1991). With this approach, Agreement is a case of phi-feature percolation. In this analysis, Case clitics will block phi-features. "If more than one phi-feature is percolated upwards, only the leftmost one results in agreement on the verb (Butt, 1993)." Butt states that although Davison's approach would account for a wider range of data, there are still some issues with it. One being that finite CPs like "that"-clauses exist, and they "parallel the function of some infinitives (Butt, 1993)." Finite CP complements could be analyzed as satisfying an argument position in the matrix verb. Importantly, LDA never occurs outside of finite CPs. Therefore, this analysis wouldn't differ from local agreement (Butt, 1993).

Butt then gives cases of optional LDA in Hindi-Urdu, presenting evidence for what blocks the morphosyntactic process. She uses these cases to support her argument that LDA follows the same patterns as simple agreement in Hindi-Urdu, as she analyzes infinitive CPs as NPs.

(21) Butt shows that LDA is blocked when there is a Case clitic on the infinitive (Butt, 1993).

- a. anjum-ne            saddaf-ko            [gaarii            calaa-ne]-ko  
Anjum. (F)-Erg Saddaf.(F)-Dat car.(F)-Nom drive-Inf.Obl-Acc  
kah-aa  
say-Perf.M.Sg  
'Anjum told Saddaf to drive a car.'

In this example, the embedded feminine object is nominative, but there is no agreement triggered on either verb in the clause (Butt, 1993). Butt states that with her approach, we can expect this, because there is no nominative NP in the matrix clause. The rest of the arguments are non-nominatives as well. The verb then inflects with the default masculine singular *-aa*. The object that is nominative has a Case clitic *-ko*, which causes the oblique inflection *-ne*. This means that the verb is unable to agree with the nominative object (Butt, 1993).

The next thing she looks at is when the matrix verb and infinitive predicate can agree with different arguments (Butt, 1993).

- (22) a. raam. [rotii k<sup>h</sup>aa-nii] caah-taa t<sup>h</sup>aa  
 Ram.(M)-Nom bread.F-Nom eat-Inf F.SG want-Impf.M.Sg was  
 ‘Ram wanted to eat the bread.’

In this example, the infinitive predicate agrees with its nominative object, and the matrix verb agrees with the subject (Butt, 1993). Butt states that this is expected under her approach because the infinitive predicate agrees with its nominative argument, and while the matrix verb agrees with its highest nominative argument, which isn’t the object, but the subject *Ram*.

Next, Butt presents another kind of infinitive, the gerundive form, which takes nominal arguments (Butt, 1993).

- (23) a. adnaan-ko [bijlii-kaa karaknaa] acc<sup>h</sup>aa nahī  
 Adnan.(M)-Dat lightning.F-GenM crackle.Inf.M good.M not  
 lag-taa  
 attached-Impf.M.Sg  
 ‘Adnan does not like the crackling of lightning.’
- b. adnaan-ko [bijlii karak-nii] acc<sup>h</sup>ii nahī  
 Adnan.(M)-Dat lightning.F-Nom crackle.Inf.F good.F not  
 lag-tii  
 attached-Impf.F.Sg  
 ‘Adnan does not like the lightning crackling.’

In these two examples, the matrix verb agrees with the infinitive, but the infinitive doesn't show agreement with its feminine argument (Butt, 1993). Instead, we see the genitive clitic *-kaa*. This acts like an adjective, and agrees with the head noun. In (23b), there is a case of LDA. *Lightning*, carries nominative agreement. Unlike the previous example illustrating optional LDA, the glossing here does not reflect a difference in specificity. These examples were used by Butt, from Mahajan (1990), and this difference is not discussed. It is notable that Butt argues for the example of (23a) being a “true noun”, unlike (23b). In (23a), the noun is “formed in the lexicon and takes a genitive argument (Butt, 1993).”

Although the examples in (23) illustrate the optionality of LDA in Hindi-Urdu, Butt considers this optionality in (24). In the first example we see LDA, but in the second, the agreement between the infinitive predicate and its nominative object is optional (Butt, 1993).

- (24) a. naadyaa-ko [gaarii calaa-nii] aa-tii hai  
 Nadya.(F)-Dat car.F-Nom drive-Inf.F.Sg come-Impf.F.Sg is  
 ‘Nadya knows how to drive a car.’
- b. naadyaa-ko [gaarii calaa-naa] aa-taa hai  
 Nadya.(F)-Dat car.F-Nom drive-Inf.M.Sg come-Impf.M.Sg is  
 ‘Nadya knows how to drive a car.’

Considering Mahajan and Davison’s analyses, Mahajan would say that the optional Case assignment is because infinitives are optionally Case assigning, and so the object moves to Spec of Agr. Both would argue that the object in the top example is more specific than the one in the bottom (Butt, 1993). Butt argues that that difference in specificity is because the first represents ‘driving a car’ and the second is more like ‘car-driving’, which is more like a “compounded structure” (Butt, 1993).

Next, Butt discusses compounding and scrambling, with scrambling being the possibility of multiple word-orders with no change in meaning (Butt, 1993). In (24), we see that same

meaning of “Nadya knows how to drive a car” and “Nadya knows car-driving”, but with other possible word-orders. In the “drive a car” version, (24a), it is possible to scramble either the entire infinitive or just the embedded object and it’s still grammatical (Butt, 1993). In (25) though, with the “car-driving” form, it is ungrammatical to scramble the embedded object by itself, which suggests that the embedded object and the infinitive form create some type of compound (Butt, 1993).

- (25) a. [gaarii calaa-naa] [Naadya-ko] [aa-taa hai]  
 Car.F-Nom drive-Inf.M.Sg Nadya.(F)-Dat come-Impf.M.Sg is  
 ‘Nadya knows car-driving.’
- b. \*[gaarii] [naadyaa-ko] [calaa-naa aa-taa hai]  
 car.F-Nom Nadya.(F)-Dat drive-Inf.M.Sg come-Impf.M.Sg is  
 ‘Nadya knows car-driving.’

Next, Butt looks at adding a modifier to the embedded object that expresses specificity when it agrees with the infinitive (Butt, 1993). This “is not possible when the infinitive and the object show no agreement (Butt, 1993)”, though. In (25a), however, it is possible because the infinitive agrees with the object. This is again indicating that the object and infinitive are forming some type of compound.

- (26) a. naadya-ko [adnaan-kii gaarii calaa-nii]  
 Nadya.(F)-Dat Adnan.(M)-Gen.F.Sg car.F-Nom drive-Inf.F.Sg  
 aa-tii  
 come-Impf.F.Sg is  
 ‘Nadya knows how to drive Adnan’s car.’
- b. \*naadyaa-ko [adnaan-kii gaarii calaa-naa]  
 Nadya.(F)-Dat Adnan.(M)-Gen.F.Sg car F-Nom drive-Inf.M.Sg  
 aa-taa hai  
 come-Impf.M.Sg is

With this data in mind, Butt outlines the advantages of the previous approaches for LDA being a successive local agreement. Recall that if infinitives are NPs, they can function as

predicates. Additionally, if agreement in Hindi-Urdu is with nominative arguments, then LDA can be treated like local agreement (Butt, 1993).

In LFG, agreement is stated at the f-structure (Butt, 1993). In Hindi-Urdu, a given expression can only be well-formed if the predicate agrees with a nominative argument, which is checked at the f-structure. Thinking about simple agreement in Hindi-Urdu, if there is more than one nominative argument in an expression, the verb will agree with the higher one (Butt, 1993). In terms of optionality, Butt looks at compounding again. She establishes that unlike English compounding, this is not lexical, and instead is happening in the syntax (Butt, 1993).

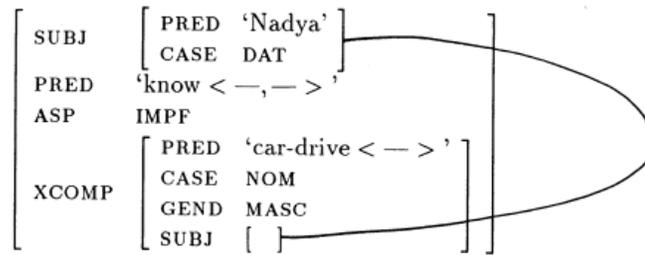
- (27) a. naadtaa-ko [gaarii calaa-na] aa-taa hai  
Nadya.(F)-Dat car.F-Nom drive-Inf.M.Sg come-Impf.M.Sg is  
'Nadya knows car-driving.'

<sup>5</sup>The f-structure corresponding to (27), shows that the predicate must agree with the object 'car', because "the object is nominative and an argument of the XCOMP PRED (Butt, 1993)". The matrix predicate 'know' also agrees with its nominative argument in the complement (Butt, 1993). Butt identifies the infinitive predicate *calaa-nii* 'to drive' as a "verbal noun", and states that both parts of this compound must be identified as heads. In the f-structure for the compounded version (27), there is no object argument (Butt, 1993). Instead, there is no nominative that the complement predicate can agree with, and it gains the default masculine. The matrix verb agrees with the nominative masculine XCOMP, and gives us LDA (Butt, 1993). Butt "directly attributes" this to the compounded structure.

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<sup>5</sup> In a previous paper, Butt proposed an a(rgument)-structure that accounts for complex predicates. In simple terms, an a-structure allows for compounding of the lowest argument with its predicate. She uses this in this paper as well. Due to the scope of this project, I will not be explaining this a-structure.

(27) b.



Butt, M. (1993, June). *A reanalysis of long distance agreement in Urdu*.  
 In *Annual Meeting of the Berkeley Linguistics Society* (Vol. 19, No. 1, pp. 52-63).

Butt points out that the only difference between a form with a compound vs. non-compound is the annotation of both components as heads in the f-structure. The arguments of the non-compound both appear in direct case.

When there is also no nominative argument that the *car-drive* can agree with, the agreement must be the default masculine. The matrix predicate 'know', agrees with the nominative masculine. The reason LDA is blocked is because of the compounding.

Butt's analysis covers a wider range of data than Mahajan (1990) and Davison (1991). She builds off of previous facts of agreement. Specifically, that, "infinitives are essentially a case of successive local agreement and that infinitive constituents have argument status (Davison 1991)." Butt concludes that LDA in Hindi-Urdu "can only take place with embedded infinitive constituents". If infinitives are analyzed as NPs, this then follows the simple agreement patterns of Hindi-Urdu (butt 1993).

Butt also identifies three kinds of infinitive constituents in her analysis. One type of infinitive is analyzed as a masculine noun, taking genitive arguments. This type of infinitive does not trigger LDA. The others being verbs that are nominalized in the syntax, and not the lexicon (Butt, 1993). The first is a compound that is created with an NP and the infinitive verbal noun. LDA does not occur simply because there is no nominative argument for the infinitive to agree with (Butt, 1993). The other type has an embedded object NP that is not compounded and this

object NP. This agreement appears to be LDA in Hindi-Urdu, but is following the rules of simple agreement (Butt, 1993).

### 3.4.2 BHATT (2005)

Bhatt (2005) presents an alternative analysis to Butt's (1993) paper. Bhatt's main argument is that LDA in Hindi-Urdu is a dissociation between Case and Agreement, and he introduces a new operation AGREE. Each facet of his analysis is used to support this new operation. He does this by extending the facts of LDA that are known for Tsez (Polinsky and Potsdam, 2001) and Kashmiri (Subbarao and Munshi, 2000). Bhatt argues for a "less local" conception, but still takes locality into consideration. He then illustrates limitations on the environments in which LDA can occur. Importantly, Bhatt acknowledges Wurmbrand's (2001) approach, and states that instances of LDA only occur with restructuring verbs.<sup>6</sup>

Like Butt (1993), Bhatt considers Mahajan's analysis of LDA as successive local agreement and that it is optional, but still finds issues with other components of the theory. He begins by establishing that the operation AGREE is required for an understanding of LDA in Hindi-Urdu. AGREE, in simple terms, is an operation that is similar to Agree (from Chomsky's Minimalist framework), that states that a head contains a set of unvalued, uninterpretable features. It then c-commands the nearest phrase with matching, interpretable features. The values of the uninterpretable features in the head are checked with those from the phrase (Bhatt, 2005).

In Bhatt's AGREE, finite  $T^0$  checks and values with the nearest phi-features (Bhatt, 2005).

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<sup>6</sup> Bhatt presents further arguments for AGREE in Hindi-Urdu as motivation for LDA. I will briefly speak on AGREE, but for this project, I will be focussing on the importance of restructuring verbs.

- (28) a. Subject agreement:  
 Mona amruud khaa-tii thii  
 Mona.F guava.F eat-Hab.F be.Pst FSg  
 ‘Mona used to eat gravas.’
- b. Object agreement:  
 Ram-ne imlii khaa-yii thii  
 Ram.M-Erg tamarind.F eat-Pfv.F be.Pst.FSg  
 ‘Ram had eaten tamarind.’
- c. Default agreement:  
 Mona-ne is kitaab-ko parh-aa thaa  
 Mona.F-Erg this.Obl book.F-Acc read-Pfv.Msg be.Pst.Msg  
 ‘Mona had read the book.’

In (28a), the subject’s phi-features check and value  $T^0$ . In (28b), they are not visible, because it is overtly case-marked. Therefore, the closest phi-features (belonging to the object), check with  $T^0$ . This results in object agreement. In the case with no visible features from either argument, there would be default masculine singular agreement (Bhatt, 2005).

Bhatt’s AGREE proposal for LDA is the same pattern as local agreement. Using AGREE to explain LDA, Bhatt illustrates  $T^0$  acts as a probe, and takes the closest visible phi-features (the embedded object (Bhatt, 2005).

- (29) a. Ram-ne [rotii khaa-nii] chaah-ii thii  
 Ram-Erg bread.F eat-Inf.F want-Pfv.F be.Pst.FSg  
 ‘Ram had wanted to eat (the) bread.’

Bhatt establishes cases of ungrammaticality with LDA. In some examples, both the infinitive and  $T^0$  would locate the same features, which leads to Bhatt’s definition of LDA in Hindi-Urdu as being parasitic agreement. Since LDA can only occur when the matrix verb lacks a nominative subject, “the infinitival verb can only agree with its object when there is LDA (Bhatt, 2005).” This, as Bhatt argues, follows local agreement patterns. There is a dependency created.  $T^0$ , and the participial head look to value their features. In (28a), the subject values them,

while in (28b), the object does, because the subject is overtly-case marked. Finally, in (28c), both the subject and object have case, and T<sup>0</sup> and the participial head claim default agreement.

Restructuring verbs are those that lack clause-boundedness effects (Wurmbrand, 2004). Examples of restructuring verbs include: *want*, *try*, *start*, *stop* and *begin*. These verbs take a subordinate clause. In Hindi-Urdu, LDA complements occur with verbs that are classified as restructuring predicates in many languages (Bhatt, 2005). These include, *want*, *let*, and *know*. To address this, Bhatt presents examples of ungrammatical LDA, contrasted with grammatical LDA. The difference in environments is that the grammatical examples occur when there is complex predicate formation (Bhatt, 2005). Below, are the examples from that section.

- (30) a. [mehnat kar-naa/\*kar-nii] achchhaa/\*ii ho-taa/\*ii hai  
 Hardwork.F do Inf.F good.D/F be-Hab.D/F be.Prs.3Sg  
 ‘It is good to work hard.’
- b. Anjum-ne Saddaf-ko [chitthii likh-ne]-kp  
 Anjum-Erg Saddaf-Dat letter.F write-Inf.Obl-Dat  
 kah-aa/\*ii thaa/\*thii  
 say-Pfv.MSg/F be.Pst.MSg/F  
 ‘Anjum told Saddaf to write a letter.’
- (31) a. mantri-ji-ne [saare samaachaar jaan-ne]  
 Minister-Hon-Erg all.MPl news.MPl know-Inf.MPl  
 chaah-e the  
 want-Pfv.MPl be.Pst.MPl
- b. Nadia-ko [gaarii chalaanii] aa-tii hai  
 Nadia-Dat [car.F drive-Inf.F] come-Hab.F be.Prs.3Sg  
 ‘Nadya knows how to drive a car.’
- c. Nadia-ne [Sarosh-ko gaarii chalaane] di-i  
 Nadia-Erg Sarosh-Acc car.F drive-Ger.Obl let-Pfv.FSg  
 ‘Nadia let Sarosh drive the car.’

Bhatt defines restructuring as, “a class of phenomena where certain ordinarily clause-bounded processes apply across the boundaries of infinitival clauses (Bhatt, 2005)”, while noting

that the processes vary between languages. He identifies *want* as a restructuring predicate in Hindi-Urdu. Bhatt identifies correlations between restructuring verbs and LDA. The difference between Bhatt's proposal and Wurmbrand's is that Bhatt allows for restructuring verbs to license accusative case (Bhatt, 2005). In (30), LDA is impossible, as the verbs are non-restructuring, and do not create complex predicates. On the other hand, the examples in (31) are permitted, since the three verbs *want*, *know* and *let* are creating these predicates. Bhatt concludes this section with the acknowledgement that restructuring verbs play an important role in identifying grammatical environments for LDA in Hindi-Urdu.

The remainder of Bhatt's paper focusses on the application of AGREE. The important conclusion for this project is that Bhatt identifies that restructuring verbs create the environment for LDA.

#### 4.0 BACKGROUND: LEXICAL REALIZATIONAL FUNCTIONAL GRAMMAR (LRFG)

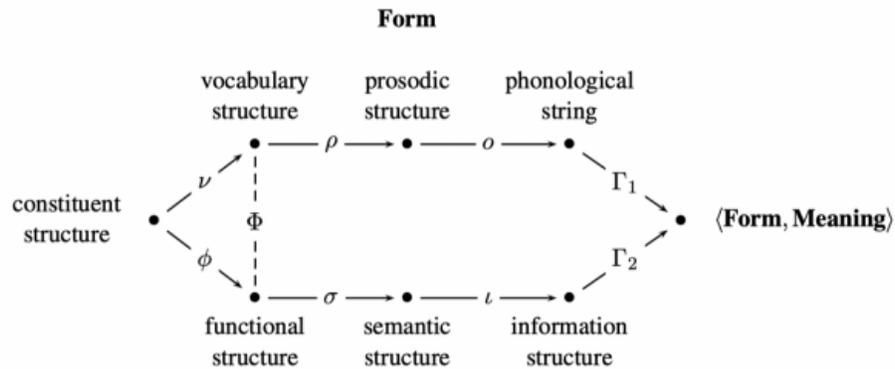
LRFG is a new grammatical architecture, derived from the combination of Distributed Morphology (DM; Halle and Marantz, 1993), which is influenced by the Minimalist Program (MP; Chomsky, 1995), and Lexical-Functional Grammar (LFG; Kaplan and Bresnan, 1982). LRFG is a "representational and constraint-based theory, that provides a realizational, morpheme-based view of word-formation (Melchin et al., 2020)". Because of this, it is well-suited to model polysynthetic languages, and complex morphological structures, like LDA. LRFG maps between f-(unctional) and c-(ategorical) structures like LFG, but also uses new rules of exponence (Melchin et al., 2020).

As Melchin et al. (2020) note, LRFG is similar to standard LFG. Instead of words, the terminal nodes in the c-structures are f-descriptions. F-descriptions are sets of equations and

constraints on f-structures. In LRFG, the c-structure maps to a v(ocabulary)-structure. In a v-structure, vocabulary items (VIs) realize the features in the terminal nodes, via a correspondence function,  $v$  (Melchin et al., 2020). A terminal node maps to more than one, often many, VIs via Spanning (Haugen and Siddiqi 2016, Merchant 2015, Ramchand 2008, Svenonius 2016), where Spanning is the process by which a single morpheme can expone a set of multiple, adjacent nodes.<sup>7</sup>

From DM, LRFG maintains the key properties of morpheme-based syntax. Like DM at its core, LRFG is non-derivational, and constraint-based. DM relies on Vocabulary Insertion for the final output of PF-operations. As such, LRFG is also a surface-oriented model (Asudeh et al., 2021). LRFG also acknowledges multiple influences on exponence. It recognizes that processes such as Affixation, are conditioned by morphosyntactic features, semantics and phonology. As stated, LRFG relies on Spanning, which is also a recognized process in DM.

(32)



LRFG's version of LFG's Correspondence Architecture. From Melchin et al. (2020:271); used with permission

There are also many similarities between LFG and LRFG. LRFG retains LFG's separate c-and f-structures. However, "there is no lexicon feeding the c-structure in LRFG (Asudeh &

<sup>7</sup> Although LRFG utilises v- and p- structures, my analysis will focus on the c- and f- structures.

Siddiqi, 2021).” Instead exists *v*-structures with information that has been expounded from the *f*-structure.

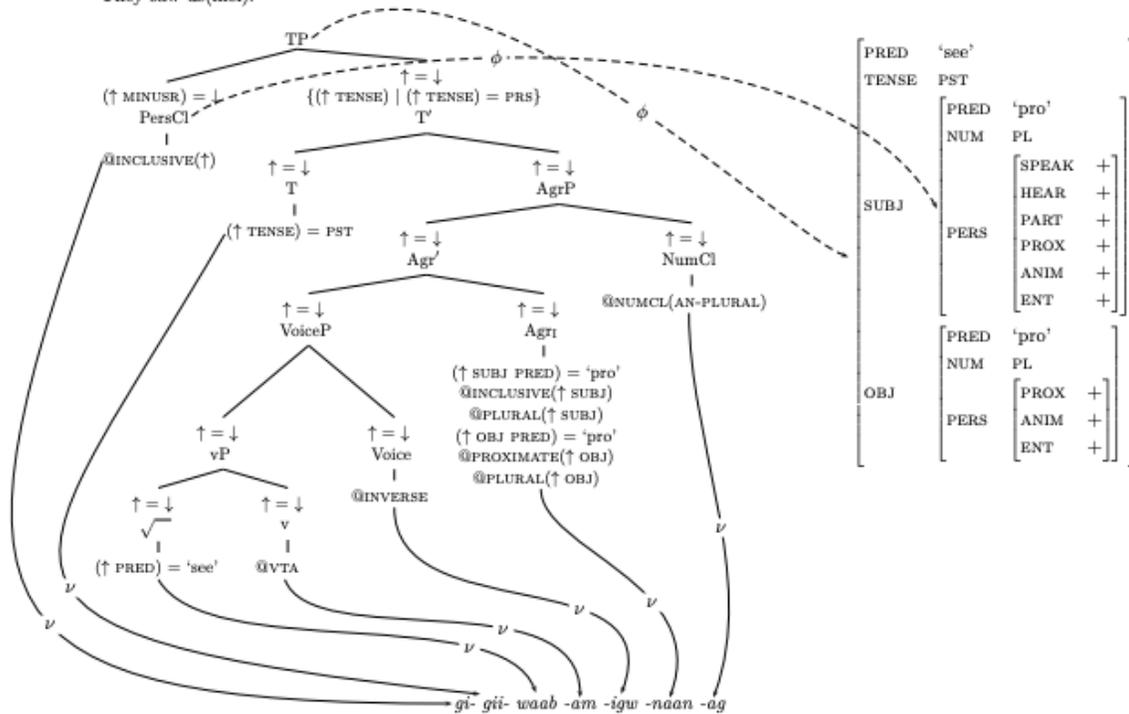
Finally, LRFG utilises *templates* (Dalrymple et al., 2004; Asudeh et al., 2013). These templates can encode a variety of grammatical descriptions, such as person/gender, verb class, obviation and number, and grammatical function, among others. Templates show constraints in a language, that determine the distribution of grammatical functions, and can explain varying systems of agreement.

Combining these features, LRFG is able to illustrate complex morphological processes on a morpheme-by-morpheme basis, while maintaining the LFG syntactic structure. The use of different structures gives explicit illustrations of these processes, and crucially, allows us to treat languages at an individual-level.

LRFG has previously been used to illustrate inflection in Ojibwe (Asudeh et al., 2020). Because Ojibwe is a non-configurational, polysynthetic language with a direct-inverse system of agreement, it presents many challenges to analyses of its morphosyntax (Asudeh et al. 2020). The person-hierarchy, which will be elaborated on in Section 2.2.1, also influences agreement. LRFG’s templates can be used to illustrate the differences in Voice, and therefore agreement, in Ojibwe. In (2), is the application of LRFG to Ojibwe. *v* maps to the terminal nodes, the phonology. Although the morphology is the input to the phonology, it does not influence the conditions of the output. The output, seen at the bottom of the tree, is conditioned by the phonology.

(33)

gi- gii- waab -am -igw -naan -ag  
 2 PST see VTA INV 1PL 3PL  
 'They saw us(incl).'



## 5.0 ANALYSIS

This section presents the application of the LRFG framework to instances of LDA in Ojibwe and Hindi-Urdu. I provide both c- and f-structures for cases in each language with apparent LDA. I argue that Ojibwe LDA is anaphoric agreement, illustrated by the matrix verb's agreement with the embedded topic. I then argue that LDA in Hindi-Urdu does not occur with a complete embedded clause, but rather a broken-infinitive, created by a restructuring verb.

### 5.1 LRFG ANALYSIS OF OJIBWE

Recall the three types of LDA in Algonquian languages from Section 2.2.2, where Highest-Rank and Agent LDA fall into a restricted set of agreement patterns. Alternatively, Free

LDA, which is the most common of the three types, presents three outcomes of agreement in Ojibwe. The matrix verb can agree with the embedded subject, embedded object, or the entire embedded clause. I am focusing on Free LDA, because of this variation.

To apply the LRFG framework, (34) presents two versions of the statement, ‘*I know that Paul visited you*’. (34a), shows agreement with the entire embedded clause, while (34b) shows agreement with the embedded subject.

- (34) a. ni-čisse:nit -e: -in [Po:n ka:= mo:pištaw -iš -k]  
 1-know.TI -3IN.OBJ-1SG [Paul PAST= visit.TA -2OBJ -3]  
 ‘I know [that Paul visited you]’ (‘I know IT that Paul visited you’)
- b. ni-čisse:nim -a: -w -Ø [Po:n ka:= mo:pištaw -iš -k]  
 1- know.TA -3AN.OBJ-1SG -3SG [Paul PAST= visit.TA -2OBJ -3]  
 ‘I know [that Paul visited you].’ (‘I know HIM that Paul visited you.’)

Although (34a) and (34b), are glossed identically, the meaning of these statements slightly varies. Through the agreement morphemes, (34a) can be identified closer to the statement, ‘*I know IT that Paul visited you*’, while (34b) is, ‘*I know HIM that Paul visited you*’. This insight is significant to the LRFG analysis of LDA in Ojibwe, because this shows the difference in agreement being conditioned for by the adjunct.

Using the agreement template from Section 2.2.2, I have split the morphemes into their respective columns, to show where the agreement on the matrix verbs appears.

c. [ CONJUNCT ]

PREFIX	STEM	THEME SIGN	(NEG)	PRONOUN PL.	MOD	NOMINAL	STEM	THEME SIGN	(NEG)	LOCAL P & #	NON-LOCAL P & #
(PERSON)		(VOICE)		(CENTRAL SUFFIX)		(PERIPHERAL SUFFIX)		(VOICE)			
ni-	čisse:nit	-e:		-in							
1SG	know.TI	- 3IN.OBJ		-1SG (SUBJ)							

d.

[ CONJUNCT ]

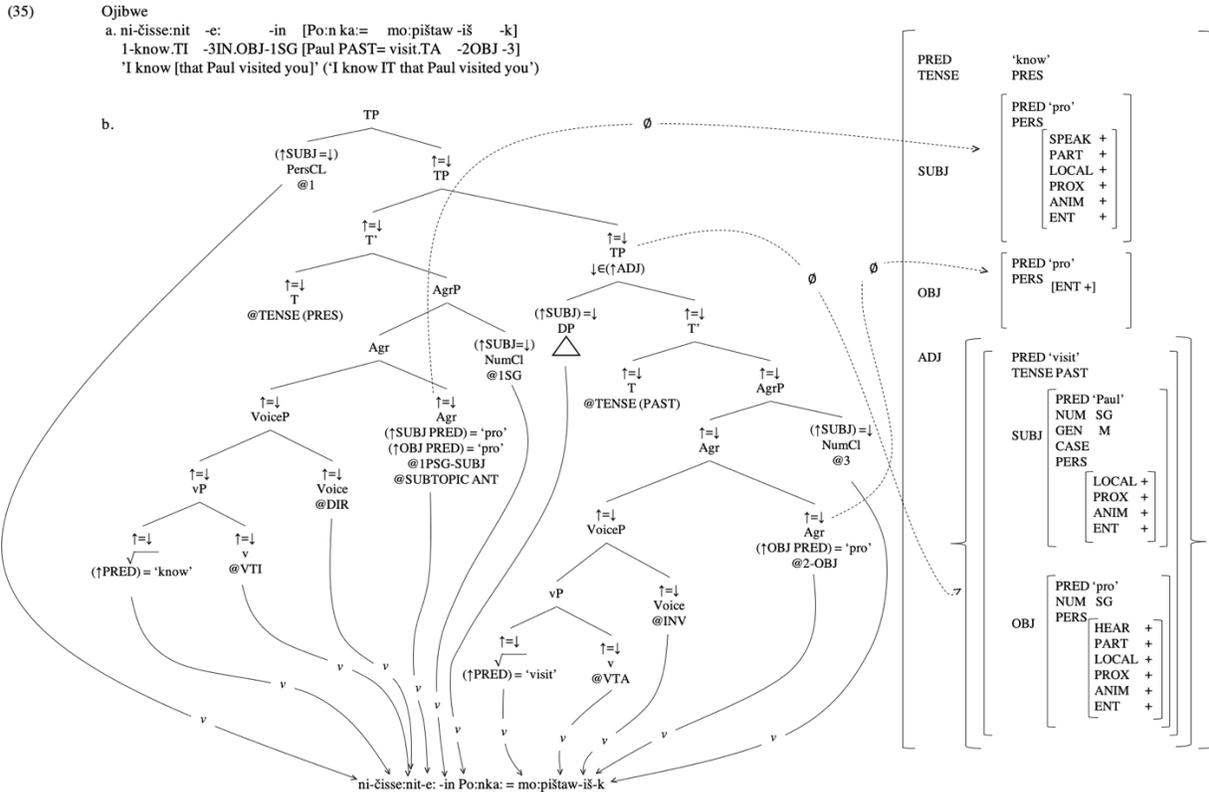
PREFIX	STEM	THEME SIGN	(NEG)	PRONOUN PL.	MOD	NOMINAL	STEM	THEME SIGN	(NEG)	LOCAL P & #	NON-LOCAL P & #
(PERSON)		(VOICE)		(CENTRAL SUFFIX)		(PERIPHERAL SUFFIX)		(VOICE)			
ni-	čisse: nim	-a:		-w		-∅					
1SG	know. TI	3AN. OBJ		-1SG (SUBJ)							

In (34c), *-e:* expresses 3IN agreement, which is with the entire embedded clause. In (34d), *-a:* shows 3AN.OBJ agreement, corresponding to the embedded subject *Paul*. Next, I will map (34a) and (34b) into LRFG c- and f- structures, beginning with (34a).<sup>8</sup>

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<sup>8</sup> I am assuming the agreement templates from Melchin et. al (2020) for Ojibwe.

The c-structure below gives us, 'I know IT that Paul visited you', where the apparent LDA is with the entire embedded clause, or rather, the default agreement.



To begin, we need to recognize the differences between this mapping versus a standard Minimalist tree. Notably, in (35a), there is no movement. Instead, word- and morpheme-order is managed in the phonology, and as mentioned in Section 4.0, the terminal nodes are the surface forms. The head of highest TP is still the SUBJ of the main clause (realized as the 1SG clitic *ni-*). The next TP splits into the remainder of the matrix clause, and the embedded clause. In the matrix VoiceP, we have an instance of Spanning, where the direct voice (@DIR), *v* (@VTI) and the predicate, *know* map to the surface form of the verb. All of this information is encoded in the configurations in this tree, allowing for the proper features to live inside the verb. The most important part of the matrix clause is the head of the leftmost AgrP, which shows the

configuration of agreement between the matrix and the embedded clause. @SUBTOPIC ANT means that the verb needs to agree with the topic of the antecedent. In this case, this node maps to the 3IN agreement in the matrix clause *-e:*, meaning the topic of the embedded clause is the entire event. This is the critical insight for my analysis, because these rules in Agr are what set up the agreement that has been interpreted as LDA. If the verb is agreeing with the topic of the adjunct clause, and realising the same features, this is not a long-distance operation. Instead, we have a form of anaphoric agreement, where the adjunct clause gives the “option” for agreement. This “option” is always its topic, and only occurs when there is an adjunct clause present. This is similar to the prothetic arguments, where there is a co-referent to the arguments in the main clause. This is features of agreement inside of the verb, which are checked based on the topic in the embedded clause. This formulation can be captured in the rule below:

$$(36) \quad a. (\downarrow\text{TOPIC})\sigma \text{ ANTECEDENT} = ((\text{ADJ}\epsilon\downarrow)\text{OBJ})\sigma$$

This rule states that when present, the topic of the adjunct clause will condition the agreement being realized on the matrix verb.

In the previous tree, the 3IN agreement on the verb indexes topical agreement with the entire embedded clause, or rather, the event itself. In (37a), *'I know HIM that Paul visited you'*, the adjunct still conditions for the agreement between the matrix verb and the topic, but in this case, it is the embedded subject that holds the topic role. I have mapped this example in the LRFG c- and f-structures below.



supports my claim of anaphoric agreement, as the adjunct topic once again conditions the agreement, and the verb is realising the same features as the topic.

This is further illustrated in the corresponding f-structure, where agreement features are defined. To be complete, there must be a matching element within the f-structure that satisfies the conditions of the matrix verb. This element (TOP), can be identified with the SUBJ, and share its features. I have shown that the TOP looks to the SUBJ for these features, that in turn, determines the features of the matrix verb.

## 5.2 LRFG ANALYSIS OF HINDI-URDU

Hindi-Urdu presents a different base for an analysis of LDA. We must create a set of c-structure rules, and agreement templates that capture the motivations for what appears to be LDA in this language. To begin, recall the rules for standard agreement in Hindi-Urdu:

- 1) Since a verb can only agree with one of its nominative arguments, it selects the highest nominative.
- 2) If both the subject and object are nominative, the verb agrees with the subject.
- 3) If there is no nominative argument, the verb carries the default inflection, which is singular and masculine (-aa).

It is true that in certain languages, the feature MASC is equal to the absence of a FEM feature. This can be said of third-person (3) and SG, as well, where 3 is the absence of a participant feature, and SG is the absence of a PL feature. That being said, the default 3.SG.MASC agreement in Hindi-Urdu is exactly what LRFG predicts, as it is simply the lack of features. Therefore, we need to put each feature on the AGR node individually.

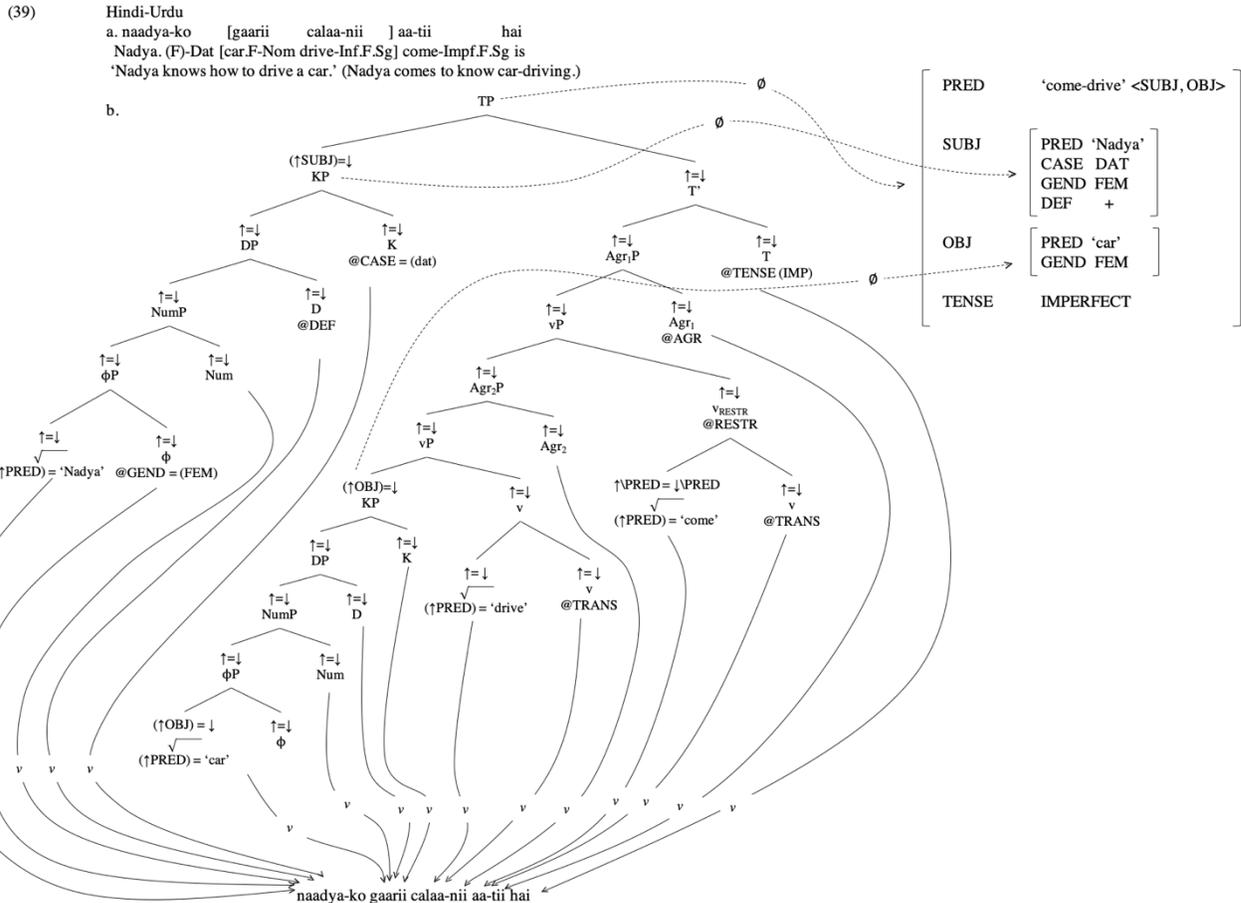
To give a concrete example to apply these feature templates to, let us consider data in

(38).

- (38) a. naadya-ko [gaarii calaa-nii ] aa-tii hai  
 Nadya. (F)-Dat [car.F-Nom drive-Inf.F.Sg] come-Impf.F.Sg is  
 ‘Nadya knows how to drive a car.’ (Nadya comes to know car-driving.)

Note that I am assuming Bhatt’s statement that LDA in Hindi-Urdu only occurs with restructuring verbs. In (38), the verb *come* takes the infinitive form of *drive*, to create a complex predicate. The agreement of the entire clause becomes FEM.SG.

Next, I have applied the LRFG framework to (38) to create the corresponding c- and f- structures, so I may elaborate on the agreement templates, and move into my analysis of LDA.



Before we explore where the features of agreement stem from, we must consider the formulation of the restructuring verb. I have defined this as @RESTR. In the tree for (38, 39a) the predicate ‘come’ and  $v_{\text{RESTR}}$  exist as sisters inside of the right branch of the vP.  $v_{\text{RESTR}}$  defines the restructuring nature of the verb, where the configuration  $\uparrow \backslash \text{PRED} = \downarrow \backslash \text{PRED}$  states that everything above and below is the same, except for the PRED feature. This  $\uparrow \backslash \text{PRED} = \downarrow \backslash \text{PRED}$  lives on the PRED *come*, and is what the restructuring verb must call together. Derived is a complex predicate, made of a combination of the root and  $v_{\text{RESTR}}$ . It is the @RESTR that constructs this complex predicate. However, it cannot do that while having two predicates of its own, this is why the restriction of the PRED feature is required, because it prevents the failure of the construction. What we are left with is not an embedded clause, but rather a complex main verb, with a non-finite head in a restructuring verb. Because of this, there is no LDA. This agreement follows the same patterns as simple clauses, but appears to be LDA because of the restructuring verb. The dative case on the subject *Naadyaa*, supports this, because the SUBJ is the recipient of the restructuring. Recall that restructuring verbs allow for processes to occur across infinitival clause boundaries (Bhatt, 2005). In this case, it is no true infinitive or embedded clause. This complex predicate creates a sort of “broken” infinitive, that is the main verb. Moving to the f-structure, this is represented by the PRED ‘come-drive’ <SUBJ, OBJ>.

Now that the form of the verb has been identified, the AGR templates must be defined. As stated, we need to put each feature on the AGR node individually. I have defined @AGR to do so, where the agreement template is actually broken into three separate ones. Each has an algorithm that searches for the target, and if the target contains a certain feature (FEM, NUM, PARTICIPANT), @AGR will take that on. These templates can be represented as follows:

- (40) @AGR: = @AGR-TARGET  
 @AGR-GEND  
 @AGR-NUM  
 @AGR-PART

These agreement templates can be described as Hindi-Urdu's ability to define the target.<sup>9</sup> If there was an instance where all arguments are case marked, there would be no target of Agr. We can consider instances of 3.SG.MASC agreement as representing these cases where there is no feature specification, because it falls under the third rule of standard agreement. The verb must agree no matter what. In (40), however, there is a target, *car*, and the value of its gender feature is FEM. This FEM feature is what appears as the agreement on the restructuring verb, because Agr has selected and taken the features of the target. Agr searches for the KP with the argument that is unspecified for case, and it will take its features. In Agr<sub>1</sub>, we can define phrase structure rules (PSR) that capture this with the following annotations.<sup>10</sup>

- (41) a. @AGR-GEND (%GF, FEM)  
 b. @AGR-NUM (%GF, SG)  
 c. (%GF) – (↑GF)  
 – (→CASE)

Rule (41a) states that AGR takes its gender feature from whichever GF it agrees with, and in this case is *car*, and FEM. The same is true in (41b), where the number feature, SG is

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<sup>9</sup> I am assuming the formalization of Agreement being developed by Asudeh, Siddiqi, and Turnbull (forthcoming). For example, here is the expanded AGR-GEND.

$$\text{AGR-GEND:} = \text{\% Targ} = (\uparrow \text{GF} \text{ )} \\
\text{\{ \{-\%Targ} \mid \text{\%Targ} \} \mid (\text{\%Targ-GEND})=\} } \\
\text{\neg (\rightarrow\text{CASE})} \quad \text{\neg (\rightarrow\text{GEND})}$$

This formalism shows that the target is selected by the verb, and the verb takes on the feature that it possesses. Both @AGR-NUM and @AGR-PART would work in the same manner, but select different features. The difference in the formulas would simply be the replacement of “GEND” with the required feature.

<sup>10</sup> GF = Grammatical Function, a variable.

derived from the target. Finally, (41c) states that AGR will agree with the highest GF that does not have case, where GF is a variable that is the SUBJ in (38). The %GF refers us to the f-structure, where it represents the argument with the features taken by the verb, *car*.

### 5.3 SUMMARY OF ANALYSES

In this section, I applied the LRFG framework to documented cases of so-called LDA in Ojibwe and Hindi-Urdu. I concluded that neither operation is LDA, and that the two operations are not same. In Ojibwe, rather than LDA, there is anaphoric agreement with the topic of the adjunct clause. Although there are three options for “Free LDA”, the adjunct presents a singular option for the verb to agree with, being its topic. I analyzed a case of embedded SUBJ agreement, to illustrate this process. I established that agreement is illustrated in the f-structure, by looking at the topic. In the f-structure, the topic takes its features from an argument within the clause, or when the topic is the entire clause it holds 3IN agreement. In Hindi-Urdu, I concluded that there was no LDA, but local agreement with a “broken” infinitive. This verb-structure is created with a restructuring verb, that takes the head of an infinitive and creates a complex predicate. I established c-structure rules that describe this agreement, that refer to the corresponding elements of the f-structure.

### 6.0 EMPIRICAL EXTENSIONS

LRFG has the ability to help us come up with alternative accounts for agreement, that implement different mechanisms than other theories of grammar. The marriage between LFG and DM gives us the appropriate tools to describe complex morphological processes. The LRFG

framework captures agreement well, and illustrates that morphology is expressed in the f-structure.

In the case of Hindi-Urdu, Bhatt's previous analysis stated that there may be an instance in which two arguments are not specified for case. According to Bhatt, Agr would take the features of the highest-ranking argument, where the SUBJ outranks the OBJ. The rules formulated in (41) may not capture this case, but it would only require adding more information to them, in addition to what is present, as it would not change what is already presented in (41). There are some cases in which the difference between the object, or the object's theta-role, is not captured. Therefore, continuing to develop c-structure rules for this language would be beneficial to the understanding of how the verb selects the leftmost argument. Additionally, it is difficult to express the specified agreement features in names and proper nouns. This presented itself with the analysis of *Naadyaa*. I would like to continue to develop my application of LRFG to names, to see create templates that accurately capture their features in agreement operations.

Because LRFG is perfectly suited for polysynthetic, and non-configurational languages, the continuation of Canadian Indigenous languages, specifically those in the Algonquian family, is a logical next step. I would like to continue to look into cases of what has been documented as LDA in these languages, to see if we can categorize those operations as the same anaphoric agreement that occurs in Ojibwe, or if there is another process taking place.

## 6.1 CONCLUSIONS

In this paper, I concluded that neither case of LDA is true cross-clausal agreement. I argued that LDA in Ojibwe was anaphoric agreement, and that LDA in Hindi-Urdu was simple agreement between the matrix verb and a complex predicate. Each requires LRFG c- and f-structural implications to explain the feature distribution and their unique restrictions.

### 6.1.1 OJIBWE

Although interpreted as LDA in previous analyses, I presented a comparison between two cases of Free LDA that show that this process is local anaphoric agreement with the topic of the embedded clause. I utilized @SUBTOPIC ANT within the @AGR node, to show that the matrix verb selects the topic of the antecedent from the DP head, by presenting a singular option for agreement. I then showed that the f-structures to illustrate the motivations for the features of this embedded topic, and that they come from the embedded argument that the verb is selecting for. This rejects the movement analyses, but retains a key point from Polinsky & Postdam (2007), in which a topic plays an important role in agreement. My conclusions are somewhat similar to a prothetic argument hypothesis, but reject the full arguments. This is because there is still a co-referencing relationship between something in the matrix clause and in the embedded clause. However, there is no extra element, rather the verb of the matrix clause presents only one option to the antecedent for its topic. The embedded clause must then select the argument that matches the verb's features, the options being the embedded SUBJ, OBJ or entire event.

### 6.1.2 HINDI-URDU

In my analysis, I reject Butt's (1993) argument, in which the subordinate clause was analyzed as a NP. I considered Bhatt's (2005) account of LDA in Hindi-Urdu, and that LDA can

only occur with restructuring verbs. I provided the c- and f-structures for *'Nadya knows how to drive a car'* which could be better translated as, *'Nadya comes to know car-driving'*. I used this example to establish agreement templates within @AGR that separately select for GEND, NUM and PART. I showed that Agr searches for the KP with the highest argument that is unspecified for case, and will take its features. I then captured this in the c-structure annotations below.

- (41) a. @AGR-GEND (%GF, FEM)  
 b. @AGR-NUM (%GF, SG)  
 c. (%GF) – (↑GF)  
     – (→CASE)

A case could be argued for an instance where %GF is not a consistent variable. In this case the PSRs would require some revision, however, the “bones” of the rules will remain the same, as they would in an instance of two arguments that are unspecified for case. As stated in Section 6.1, future projects could refine these rules and adapt them to different cases.

### 6.3 LRFG

In this paper, I argued that LDA in Ojibwe and Hindi-Urdu are neither LDA, or the same process. I argued that these are two different operations of agreement. I also argued that LRFG is the key to understanding these complex morphological phenomena, and that it offers insights into exceptional agreement processes. I presented previous analyses of LDA in Ojibwe and Hindi-Urdu. I used these analyses as a foundation for my application of the new LRFG framework to each language.

LRFG is able to capture the processes occurring in Ojibwe and Hindi-Urdu. It allows us to create alternative accounts for agreement, that implement different mechanisms than other theories of grammar, such as a morpheme by morpheme analysis, within an LFG structure. The

marriage between LFG and DM gives us the appropriate tools to describe complex morphological processes. The LRFG framework captures agreement well, and illustrates that morphology is expressed in the f-structure. Although it was not the focus of this project, LRFG allows for surface formations to be handled in the phonology, as the morphology does not condition the final output. The model is neither purely word- or morpheme based (Melchin et. al , 2020), and relies on Spanning for realizations. In previous frameworks, we lack crucial components in the analyses to help explain the anomaly that has been labelled LDA. In approaches that use LFG, like Butt's (1993) account, we do not have the morphological analysis garnered from DM. In a minimalistic approach, like Branigan and Mackenzie's (2007) paper, we do not have the meaning given with an f-structure, that allows us to see the coreference with the embedded topic. LRFG marries the ideal features from each theory of grammar.

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