PROVOCATIVE FEATURE DELETION: A SYNTACTIC MODEL OF AGREEMENT ALTERNATIONS IN NOUN INCORPORATION CONTEXTS

by
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Abstract

The relationship between noun incorporation (NI) and the agreement alternations that occur in such contexts (NI Transitivity Alternations) remains inadequately understood. Three interpretations of these alternations (Baker, Aranovich & Golluscio 2005; Mithun 1984; Rosen 1989) are shown to be undermined by foundational or mechanical issues. I propose a syntactic model, adopting Branigan's (2011) interpretation of NI as the result of "provocative" feature valuation, which triggers generation of a copy of the object that subsequently merges inside the verb. Provocation triggers a reflexive Refine operation that deletes duplicate features from chains, making them interpretable for Transfer. NI Transitivity Alternations result from variant deletion preferences exhibited during Refine. I argue that the NI contexts discussed (Generic NI, Partial NI and Double Object NI) result from different restrictions on phonetic and semantic identity in chain formation. This provides us with a consistent definition of NI Transitivity Alternations across contexts, as well as a new typology that distinguishes NI contexts, rather than incorporating languages.

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Glosses and abbreviations

Where possible, I have made glosses consistent across examples. Glosses remain unchanged in cases where my sources did not provide a more specific gloss and I was unable to trace it back to the original source.

Agreement glosses

1	first person
2	second person
3	third person
s	singular
du	dual
p	plural
S	subject
O	object
m	masculine
f	feminine
n	neuter
A, B, C	noun gender classes in Southern Tiwa
Ø	null morpheme, defined on an individual basis
I-IV	vegetable noun gender class in Gunwinggu
	(I = masculine, II = feminine, III = vegetable, IV = neuter)
INTR	intransitive
TR	transitive

The following are examples of combined subject/object agreement glosses. Morphemes that stand for agreement with either the subject or object will be glossed with the structure "1pS" (first person plural subject) or "2sO" (second person singular object). Transitive

morphemes that stand for both subject and object agreement will be glossed with the following structure: “1p|3s” (i.e., first person plural subject, third person singular object), with the subject gloss always preceding the object gloss.

Other glosses

ABS	absolutive Case
AGT	grammatical agent
ART	article
ASP	aspect
CAUS	causative
COMIT	comitative
CONT	continuous
DEFOC	defocusing
DIST	distributive
ERG	ergative Case
EXP	expletive
FACT	factual
IMPF	imperfective
INCOMP	non-completive
IND	indicative mood
NE	particle in Mohawk data
NOM	nominative Case
NSF	noun suffix
NM	nominalizer
PART	participial mood
PAST	past tense
PERF	perfect
PORT	portative
PROG	progressive aspect
PUNC	punctual
TNS	tense

Category labels

C	complementizer, head of CP
comp	complement
comp-XP	complement position of XP
D	determiner, head of DP
DO	direct object
IN	incorporated nominal
IO	indirect object
N	noun, head of NP
spec	specifier
spec-XP	specifier position of XP
T	tense, head of TP
v	little *v*, (i.e., light *v*), head of *v*P
V	lexical V, head of VP
X^{1}	word level syntactic structure
XP	phrase level syntactic structure

Abbreviations used in text

EPP	Extended Projection Principle
FDP	Feature Deletion Parameter (Baker, Aranovich & Golluscio (2005))
LF	logical form
MVC	Morphological Visibility Condition (Baker 1988, 1996)
NI	noun incorporation
P-feature	provocative feature
PF	phonological form
PFDM	Provocative Feature Deletion Model
PS	Provocative Syntax
[u-ROOT]	the provocative feature that motivates head movement
[ROOT]	a feature/type of material that is the goal of [u-ROOT] valuation
Types I-IV	Four types of incorporating languages from Mithun's (1984) evolutionary incorporating language typology
[u-wh]	the provocative feature that motivates wh-movement
[wh]	the feature that is the goal of [u-wh] valuation
ϕ	phi features (i.e., (person, number, gender features)
θ	theta, as in θ-licensing an argument

Chapter 1: Context

A great deal of work has been devoted to studying the interaction between Noun Incorporation (henceforth, NI)[1] and the phenomena that exhibit altered behaviours in NI contexts. Progress has been made in many theoretical areas and yet, despite continued efforts, just as many remain inadequately understood. The expression of verbal transitivity (i.e., a verb's need for both a subject and an object) through agreement is one of these more elusive types of NI-related phenomena.

It has long been observed that some languages permit transitive agreement (i.e., subject and object agreement) in incorporating constructions while other languages exhibit intransitive agreement (i.e., subject agreement only) in the same contexts.[2] Southern Tiwa is an example of a language that allows the verb to agree with its direct object (henceforth, DO) in both non-incorporating and incorporating constructions. An incorporating and non-incorporating minimal pair from this language is shown in (1) below. Note that transitive agreement (represented by the prefix *bi-*) is grammatical in both the non-incorporating construction in (1a) and the incorporating construction in (1b):

1 NI refers to contexts in which a nominal gets expressed as a morphological root that is embedded within the verb complex, yet retains its argumenthood (Baker, Aranovich & Golluscio 2005:138).

2 In keeping with the Polysynthesis Parameter (Baker 1996:14), I assume that agreement between a θ-role assigner and its argument(s) is morphologically expressed on the θ-role assigner. Under this assumption, it should be possible to determine whether or not transitive agreement has occurred based on the presence or absence of object agreement morphology on the verb.

(1) Southern Tiwa (Allen, Gardiner & Frantz 1984:295)

a. Wisi seuanin **bi**-mũ-ban.
two man.p **1s|B**-see-past
"I saw two men."

b. **Bi**-seuan- mũ-ban
1s|B-man-see-past
"I saw the men."

Other languages, such as Nahuatl, do not permit transitive agreement morphology in incorporating contexts (henceforth, NI contexts). In the non-incorporating Nahuatl data shown in (2a), the object agreement morpheme *-ki-* is grammatical. But (2b) shows that this morpheme is ungrammatical when NI occurs.

(2) Nahuatl (Merlan 1976:185)

a. Ika tlaʔke Ø-**ki**-teteʔ-ki panci.
with what 3sS-**3sO**-cut-past bread
"With what did he cut the bread?"

b. Neʔ Ø-(***ki**)-panci-teteʔ-ki ika kočillo.
3s 3sS-**3sO**-bread-cut-past with knife
"He cut the bread with a knife."

The same agreement pattern can be found in Mapudungun, a language spoken in Chile and Argentina. In non-incorporating contexts, such as (3a) below, the object agreement morpheme *-fi-* is required. But in the NI paraphrase of this sentence in (3b), the object agreement morpheme is not permitted.

(3) Mapudungun (Baker, Aranovich & Golluscio 2005:141; from Smeets 1989)

a. Ngilla-**fi**-ñ ti waka.
buy-**3O**-ind.1sS the cow.
"I bought the cow."

b. Ngilla-waka-(***fi**)-n.
buy-cow-***3O**-ind.1sS
"I bought a cow."[3]

There are two kinds of agreement alternations that can be observed in examples (1) – (3): agreement alternations between incorporating languages (i.e., the difference between examples (1) and (2)) and agreement alternations within incorporating languages (i.e., the difference between examples (2a) and (2b), or (3a) and (3b)). These alternations raise two questions. First, why is transitive agreement in NI contexts grammatical in some languages but ungrammatical in others? And second, why do some languages bar transitive agreement in NI contexts but permit it in non-incorporating contexts?

These two questions boil down to one if we adopt two widely accepted assumptions: first, that transitive agreement is the cross-linguistic norm in non-incorporating contexts (assuming that agreement occurs), and second, that incorporating constructions derive from constructions that resemble their non-incorporating minimal pair.[4] Under these assumptions, the agreement relationship between a verb and its object can be altered in some languages when NI occurs, resulting simultaneously in agreement alternations between NI and non-NI contexts and between the NI contexts of different

3 The difference in referentiality between examples (3a) and (3b), though potentially related, is not part of the current discussion.

4 In Chapter 2, I discuss alternatives to this syntactic interpretation of NI and show that the syntactic approach is preferable.

languages. Since these two types of variation result from a single alternation in the syntax, they can be referred to collectively as NI Transitivity Alternations and defined as follows:

(4) **NI Transitivity Alternations:** cross-linguistic alternations in agreement morphology in NI contexts, and/or intra-linguistic alternations in agreement morphology between non-incorporating and NI contexts.

Having joined these two types of alternations under a common term, we arrive at a unified research question: what causes NI Transitivity Alternations?[5]

Although a wealth of data from languages displaying NI Transitivity Alternations exists, the cause of these alternations is not yet fully understood. A few theoretical models have been proposed to explain these phenomena, but as will be shown in Chapter 2, even the most promising model has mechanical issues. My goal is to create a theoretical model that is fundamentally secure enough to account for these phenomena. I will show that, by building on the existing literature within a new theoretical framework, this goal is attainable. I call it The Provocative Feature Deletion Model.

A secondary goal of this project is to understand the relationship between different NI contexts. Three NI contexts will be addressed in the course of developing the new model. It will be shown that the new interpretation of NI Transitivity Alternations reveals

5 I assume that Case assignment is part of the agreement relationship that happens between a verb and an object. Case is not, however, the focus of this study. Once I introduce the new model of NI Transitivity Alternations, I will use the term "agreement" only to refer to [u-ϕ] feature valuation, but will continue to assume that this feature valuation procedure is generally accompanied by Case assignment.

a previously unidentified link between each of the NI contexts observed. This link forms the basis of a new abstract typology of NI contexts.

Chapter 2: Background

1. Introduction

In this chapter, I show that the issue of NI Transitivity Alternations has not yet been adequately addressed in the linguistic literature. The relevant literature on NI contains a wealth of data from incorporating languages, as well as three models that offer different interpretations of what might be the cause of NI Transitivity Alternations, namely, the models produced by Mithun (1984), Rosen (1989), and Baker, Aranovich & Golluscio (2005). In this chapter, I provide a general summary of these three models, explain each model's interpretation of NI Transitivity Alternations, and discuss the advantages and disadvantages of each approach. These discussions lead me to conclude that the research question has not yet been fully answered and that we are therefore still in need of an adequate model of NI Transitivity Alternations.

2. Lexicalist approaches

In the following section I outline the two lexicalist models that address the issue of NI Transitivity Alternations, highlighting the ways in which each has made a lasting contribution and the ways in which each is unable to provide an adequate interpretation of these alternations.

2.1 Mithun (1984)

Mithun (1984:863) defines NI as a lexical process that develops out of simple compounding with the purpose of providing the verb with background information.

Mithun adopts a lexicalist interpretation of NI, meaning that the incorporated nominal (henceforth, IN) and the verb stem are generated together as a unified constituent in the lexicon before being entered into the syntax.

Mithun argues that incorporating languages "evolve" and "decay" along a continuum of NI-related behavioural complexity (p. 874). A more evolved incorporating language displays more complex NI-related "behaviour" and provides the verb with more background information than a less evolved incorporating language (p. 863). Transitive verbal agreement is an example of an NI-related behaviour that generally increases in complexity the more evolved an incorporating language is.

Mithun further argues that NI-related behaviours can be arrested at any stage of development (p. 848). Arrested development does not occur at the same stage for all languages. Thus cross-linguistic differences between incorporating languages result from the fact that the behavioural complexity of different incorporating languages can be arrested at different stages of development.

Mithun argues that incorporating languages can be classified according to the stage of NI development in which they are arrested (1984:863). Since a given language must evolve through all previous stages to reach the stage at which its development is arrested, each incorporating language type is "cumulative". In other words, languages display behaviours associated with every stage of NI development leading up to and including the stage of arrested development. Mithun distinguishes four main types: Lexical Compounding (Type I), Manipulation of Case (Type II), Manipulation of Discourse (Type III), and Classificatory NI (Type IV). Each type is outlined below.

In Type I languages (such as Oceanic, Mayan and Comanche), NI is a kind of compound formation. In Type I language contexts, when a nominal is generated as part of the verb complex rather than in DO position, the IN loses its argumenthood, (i.e., becomes unmarked for definiteness, number and Case), and instead acts as a non-salient, non-referential component of a conventionalized verbal concept (p. 848). Type I incorporating verbs are invariably intransitive due to the IN's structural and semantic unification with the verb (1984:859). An example of Type I incorporation in the Tsimshian language Nisgha is provided in (5) below:

(5) Nisgha (Tarpent 1982:33)

UR		Orthography
/ kyáł hó:n /	→	[gahlhoon]
to.spear fish		
"to spear fish"		

According to Mithun, the IN, *hó:n* "fish", is not recognized as an argument of the verb, limiting the verb to intransitive agreement.[6]

Like in Type I languages, INs in Type II languages also lose their argumenthood. But unlike in Type I languages, the presence of the IN inside the verb complex in a Type II language does not decrease the verb's valency. Thus the verb is able to agree with an unincorporated nominal despite the presence of an IN within the verb complex (Mithun

6 Whether or not the verb's valency is decreased by the presence of the IN is irrelevant because having both an IN and an unincorporated object in the same construction is not a Type I incorporating language behaviour. Thus if the verb's valency is unaffected by the IN, it still must be realized with intransitive agreement because there are never unincorporated arguments available for agreement in Type I contexts.

1984:859). Languages that exhibit Type II agreement behaviour include Tupinamba, Yucatec and Blackfoot (p. 858).

An example of a Type II incorporating constructions from Yucatec Mayan is shown in (6) below. In (6a), which is the non-incorporating equivalent of (6b), *če'* "tree" is generated in DO position and *in-kool* "my cornfield" is generated as an oblique object. But in (6b), where *če'* is generated as part of the verb complex, the oblique object assumes the empty DO position:

(6) Yucatec Mayan (Mithun 1984:858; from Bricker 1978)

a. k-in-č'ak-Ø-k če' ič'il in-kool
INCOMP-I-chop-it-IMPF tree in my-cornfield
"I chop the tree in my cornfield."

b. k-in-č'ak-če'-t-ik in-kool
INCOMP-I-chop-tree-**TR**-IMPF my-cornfield
"I clear my cornfield."

When the oblique object is generated in DO position, the verb agrees with it (as is indicated by the transitive suffix *-t* (in bold)) despite the presence of the IN. In Mithun's terms, agreement with the otherwise oblique object is permitted because the IN does not decrease the verb's valency. Thus Yucatec Mayan is classified as a Type II language.

In Type III languages, NI is used to background previously known or less significant information in order to make this information less salient in the discourse (Mithun 1984:862). The presence of the IN narrows the scope of the verb, rendering the verb intransitive. Because the verb has no object Case left to assign, Type III languages

generally do not permit external objects to accompany the IN. Examples of Type III languages include Nahuatl, Korjak, and Chukchi (p. 861). In the Type III incorporating data from Korjak in (7) below, the DO, *yúñi* "whale", is considered background information by its third mention, and is therefore generated as part of the verb:

(7) Korjak (Mithun 1984:862; from Bogoras 1917)

wǘtču iñínñin yúñi qulaívun. mal-yúñi. ga-**yúñi**-upényiḷenau.
this.time.only such whale. it.comes good-whale they-**whale**-attacked
"This is the first time that such a whale has come near us. It is a good one (whale).They attacked it (the whale)."

In Type IV languages, the transitivity of the verb is unaffected by the IN. Thus, as in Type II languages, the verb is able to assign object Case to an unincorporated nominal. But unlike in Type II languages, the unincorporated nominal in a Type IV language is semantically related to (but more specific than) the IN (Mithun 1984:868). This semantic relationship between the IN and the unincorporated object does not exist in the other three incorporating language types and is therefore considered a more evolved behaviour. Languages that Mithun classifies as Type IV include the Caddoan languages, Mohawk, and Gunwinggu (p.867). In the example of Type IV incorporation from Gunwinggu shown in (8), the IN, *dulg* "tree", narrows the scope of the verb while the unincorporated object, *mangaralaljmayn* "cashew nut", acts as the more-specific patient of the verb:[7]

7 This data is interpreted syntactically in the terms of the new model in Chapter 5 Section 2.

(8) Gunwinggu (Mithun 1984:867; from Oates 1964)

bene-dulg-naŋ mangaralaljmayn.
3duS-tree-saw cashew.nut
"They saw a cashew tree."

The main distinction between the four incorporating language types is the increasingly complex discourse functions of NI. In Type I languages, the IN is completely non-referential (Mithun 1984:848). In Type II languages, the IN can express information that is familiar in the discourse, although it is still unmarked for definiteness, number and Case (p. 859). In Type III, the IN maintains enough referentiality to provide known or less significant information in the discourse (p. 862). Finally, in Type IV, the IN is given a generic meaning that is supplemented by a semantically-related, unincorporated object that is more highly specified than the IN (p. 868).

An implied assumption of Mithun's model is that all incorporating languages display transitive agreement in NI constructions that contain both an IN and an unincorporated object (applies to object NI only), and intransitive agreement in contexts where the IN is not accompanied by an unincorporated object (applies to subject NI and Types I and III object NI).

It was not the main goal of Mithun's (1984) work to offer an interpretation of NI Transitivity Alternations. But a definition is still implied: Mithun interprets these alternations as morphological indications that incorporating languages stabilize at different stages of evolution, and further, that this evolution occurs in the lexicon.

One drawback of Mithun's typology is that, unlike referentiality, transitivity in NI contexts does not consistently increase in complexity throughout the four stages of NI evolution. Mithun's interpretation requires incorporating languages to evolve through a stage (i.e., Type III) in which transitivity in NI contexts temporarily regresses. Table 1 below shows the erratic transitivity pattern that results from effects on verb valency in each incorporating language type:

Table 1: Transitivity patterns in Mithun's (1984) incorporating language typology

Type	**Verb valency**	**Transitivity**
Type I	Verb valency cannot be expressed	intransitive
Type II	Verb valency is unaffected by the IN	transitive
Type III	Verb valency is decreased by the IN	intransitive
Type IV	Verb valency is unaffected by the IN	transitive

The regressive transitivity behaviour that occurs in Type III languages challenges Mithun's assumption that NI-related phenomena get increasingly complex as incorporating languages evolve.

In addition to this drawback, Mithun's model is limited by its lexicalist framework. Since Rosen's (1989) model is grounded in the same problematic assumption, we will get to know Rosen's model before I explain the drawbacks of adopting a lexicalist framework.

2.2 Rosen (1989)

Although Rosen (1989) was mainly concerned with finding a way to account for modifier stranding in NI contexts, her model directly addresses the issue of NI Transitivity Alternations. Rosen argues that NI is a lexical process that can be divided into two distinct types: Compound NI and Classifier NI.

In Compound NI contexts, an IN is generated as part of the verb complex. The presence of the nominal inside the verb complex satisfies one argument of the verb, leaving the verb with a single argument that must be assigned to its subject. Thus the verb, which would otherwise display transitive agreement, is "detransitivized" (p.295). Rosen refers to this detransitivization process (which again, occurs in the lexicon rather than the syntax) as "saturation", a term less associated with syntactic operations.

The Ponapean data in (9) below illustrates the saturation process that occurs in Compound NI languages. In the non-incorporating construction in (9a), the verb bears the transitive agreement morpheme, *-i*, because the verb able to agree with the argument, *lohs*, in DO position. But when this argument is generated as part of the verb complex, as in (9b), the verb bears a null intransitive agreement morpheme *-Ø*:

(9) Ponapean (Rehg 1981:212)

a. I pahn perek-**i** lohs.
I will unroll-**tr** mats
"I will unroll mats."

b. I pahn perek-**Ø**-los.
I will unroll-**intr**-mat
"I will mat-unroll."

Rosen (1989:295) argues that the absence of transitive agreement in the NI context shown in (9b) results from the verb's object argument being saturated by the IN during its generation in the lexicon.

In Classifier NI contexts, on the other hand, the IN does not satisfy one of the verb's arguments through saturation (p. 296). Consequently, the verb still has two arguments to assign. But agreement with the IN is impossible because it is not within the verb's c-command domain.[8] Thus the verb seeks agreement with an unincorporated argument, which, being successful, results in the presence of transitive agreement morphology on the verb. The unincorporated argument in these contexts may be a nominal in DO position with a null or spelled-out form, or even a stranded modifier (which, in Rosen's terms, is technically not "stranded" by the IN during the syntax, but rather generated in the specifier position of an empty NP).

Onondaga is a language that displays transitive agreement morphology in both non-incorporating and incorporating contexts, and is thus interpreted by Rosen as a

8 Although it is not explicitly stated, Rosen (1989) implies that agreement is a syntactic operation, and thus it should be subject to the usual limitations of c-command.

Classifier NI language (p. 295). In both the non-incorporating example in (10a) and the incorporating example in (10b), there is transitive agreement morphology on the verb. In the case of the incorporating construction, this indicates that saturation did not occur during IN-verb formation, and that the verb was able to agree with a null, unincorporated DO whose [ϕ] feature values match those of the IN:[9]

(10) Onondaga (Rosen 1989:295; from Woodbury 1975:10)

a. waʔhahninúʔ nʔ oyɛ́kwaʔ.
TNS.**3s|3N**.buy.ASP ART 3N.tobacco.NM
"He bought tobacco."

b. waʔhayɛʔkwahní:nuʔ.
TNS.**3s|3N**.tobacco.buy.ASP
"He bought tobacco."

So how are NI Transitivity Alternations defined in Rosen's (1989) terms and what is the cause of them? For Rosen, NI Transitivity Alternations are a morphological indication that saturation does not occur in all languages. Languages in which saturation does not occur display transitive agreement morphology in NI contexts, whereas languages in which saturation does occur display intransitive agreement morphology in NI contexts.

2.3 Reasons for rejecting lexicalist models of NI Transitivity Alternations

Although there are aspects of Mithun's (1984) and Rosen's (1989) models that help point us towards an explanation, I argue that these models are ultimately unable to account for

9 Rosen (1989) does not assume that the non-incorporating and incorporating constructions in (10) have a syntactic relationship. The non-incorporating data is simply shown to demonstrate that transitive agreement is standard in both contexts in Onondaga.

NI Transitivity Alternations because both are set in the lexicalist framework. The main argument against adopting this framework is that it cannot explain the well-attested subject/object asymmetries that exist in NI contexts (see Baker 1988; 1996; Baker, Aranovich & Golluscio 2005; among others). In other words, lexicalist models cannot account for why object incorporation happens freely but subject incorporation is restricted to the context of incorporation into unaccusative verbs.[10] If NI is defined as the generation of nominals inside the verb complex in the lexicon, then nothing should prevent the nominals normally associated with subjects from incorporating as freely as the nominals normally associated with objects because they only become "subjects" or "objects" by being generated in such positions. But this prediction does not reflect the rigid restrictions on subject incorporation that actually exist. It would be an understatement to interpret these asymmetries as simply a form of parametric variation.

Unlike the lexicalist framework, a syntactic framework can easily explain subject/object asymmetries in NI contexts. Syntactic models of NI assume that incorporating constructions derive from non-incorporating constructions, meaning that INs originates in DO position. Following its initial generation, the object is displaced from DO position through a syntactic movement operation (which can be interpreted in a variety of ways depending on the theory) and subsequently merged inside the verb complex.

10 The term "unaccusative" refers to a predicate whose subject was originally its complement (Burzio 1986:27).

It is generally assumed in syntactic theory that only c-commanded nominals can be incorporated (Baker 1988, 1996). If this assumption is correct, then subjects originating in the verb's specifier position should be impossible to incorporate into the verb because this position is not within the verb's c-command domain. On the other hand, it should be possible for subjects that originate inside the verb's c-command domain to incorporate freely. Not only does this theory explain why subject incorporation is so highly constrained cross-linguistically, it also explains why subject incorporation into unaccusatives is permitted: subjects of unaccusative verbs originate in DO position. In this interpretation, subject incorporation into unaccusatives is simply another form of object incorporation, which leads to the simple conclusion that only object NI is permitted cross-linguistically. This syntactic interpretation of NI is more widely accepted in the linguistic literature than the lexicalist interpretation (Baker 1988; 1996; Baker, Aranovich & Golluscio 2005; Johns 2007; 2009; Sadock 1980; Spencer 1995; among others).

In conclusion, neither Mithun's (1984) nor Rosen's (1989) models adequately account for NI Transitivity Alternations because they interpret NI as a lexical process. But both models have informed the only syntactic (and most promising) model of NI Transitivity Alternations to date: the Feature Deletion Parameter.

3. A syntactic approach: Baker, Aranovich & Golluscio (2005)

The Feature Deletion Parameter (henceforth, the FDP), which was created by Baker, Aranovich & Golluscio (2005) (henceforth simply Baker et al.), is currently the only syntactic model of NI Transitivity Alternations. It is set in a loosely-defined Minimalist

framework (discussion to follow in Section 3.1 below). Before outlining the FDP, I will explain how Baker et al. define the relevant terms.

In the FDP, NI is interpreted as a syntactic movement operation that involves copy formation (i.e., creation of a second copy of a nominal), merge (i.e., unification of the second copy of the nominal and the verb stem), and copy deletion (a term which Baker et al. use to refer to deletion of the original copy of the nominal) (p. 153). Copy formation and copy deletion have the combined effect of forming a trace (i.e, a phonetically null noun phrase that assumes the original copy's vacated position).[11] A verb can only incorporate a nominal within its c-command domain because the IN must c-command its trace (Baker 1988:60).

Baker et al. interpret object agreement as valuation of the verb's [u-ϕ] features and Case assignment. An implied assumption of this interpretation is that transitive agreement is determined by the presence of an available set of [ϕ] features within the verb's c-command domain (p. 153). Thus verbs that have a nominal in DO position can and will express their transitivity unless something happens to make the object (or more specifically, its [ϕ] features) unavailable for agreement.

Now that the relevant terms have been defined, I will outline the FDP. Baker et al. argue that the following sequence of operations occurs in all incorporating languages. First, a verb phrase is generated containing a nominal that bears [ϕ] features in DO position. A second copy of the object forms and (at some point that is unspecified) gets

11 I have used the terms “original copy” and “second copy” to make it easier for the reader to distinguish between them, but these are not Baker et al.'s terms. See Section 3.1.1 for more detail.

merged inside the verb. The original copy of the object is then deleted, leaving in its place a trace (p. 153). Trace formation marks the end of the movement operation. Following movement, the verb attempts to value its [u-ϕ] features by agreeing with an available nominal within its c-command domain. But there is no such nominal available for agreement since the original copy has already been deleted from DO position. So how can object agreement occur?

Instead of assuming that object agreement can only occur if there is an available nominal within the verb's c-command domain, Baker et al. argue that agreement occurs if [ϕ] features remain in the trace in DO position (p. 154). If, on the other hand, [ϕ] features are deleted along with the original copy of the object, object agreement is impossible. Thus object agreement can and will occur if [ϕ] features attach to the trace.

Let us walk through each scenario that Baker et al. describe, starting with what happens when [ϕ] features are deleted along with the original copy of the object. Following copy and feature deletion, a trace remains in the vacant DO position (p.154). When NI is complete, the verb's next priority is to value its unvalued [ϕ] features through object agreement. But since there are no [ϕ] features left in the trace with which the verb can agree, object agreement cannot occur. Thus the verb is realized with intransitive agreement morphology. This scenario correlates with Rosen's (1989) Compound NI, in which context the presence of a nominal inside the verb complex “saturates” one argument of the verb and renders the verb intransitive.

This "feature deleting" interpretation applies to the Mapudungun data in (11) below. The non-incorporating data in (11a) shows the DO in its original position. Since NI has not occurred in this example, there has been no opportunity for [ϕ] features to be deleted from the object. Thus the verb is able to agree with its DO, as is indicated by the object agreement morpheme *-fi-*:

(11) Mapudungun (Baker, Aranovich & Golluscio 2005:141; from Smeets 1989)

a. Ngilla-**fi**-ñ ti waka.
buy-**3O**-IND.1sS the cow
"I bought the cow."

b. Ngilla-waka-(***fi**)-n.
buy-cow-***3O**-IND.1sS
"I bought the cow."

In (11b), we find the nominal *waka* "cow" incorporated into the verb complex. In FDP terms, this nominal begins in DO position. After a second copy of the nominal is formed, the [ϕ] features attached to the original copy are deleted along with the original copy. Thus there is nothing left inside the verb's c-command domain with which the verb can agree. Since the verb can only agree with its subject, it is realized with intransitive agreement morphology.

In the second scenario, [ϕ] features survive copy deletion and remain in the trace that assumes the vacant DO position (Baker, Aranovich & Golluscio 2005:154). Following NI, the verb attempts to agree with its object. Finding the feature-bearing trace

in DO position, agreement takes place. As a result, the incorporating construction is realized with transitive agreement morphology. This correlates with Rosen's (1989) Classifier NI, in which context saturation of one of the verb's arguments does not occur.

Baker et al. (2005:139) apply the latter interpretation to NI in Mohawk, as shown in (12) below. In (12a), the nominal *nakt* "bed" appears in DO position where it was initially generated. The transitive agreement morpheme *-k-* appears on the verb because the object and its [ϕ] features were available for object agreement.

(12) Mohawk (Baker 1996:12)

a. Wa'-**k**-hninu- ne ka-nakt-a'.
FACT-**1s|3s**-buy-PUNC NE NSS-bed-NSF
"I bought the/a bed."

b. Wa'-ke-nakt-a-hninu-'.
FACT-1sS-bed-**Ø**-buy-PUNC
"I bought the/a bed."

In (12b), we find the object incorporated into the verb complex and transitive agreement morphology on the verb.[12] This is taken to indicate that [ϕ] features survived deletion of the original copy of the object and attached to the trace, which allowed them to remain available for object agreement (p. 162).

Baker et al. correlate this distinction between [ϕ] feature-deleting and [ϕ] feature-retaining languages with Types III and IV of Mithun's (1984) incorporating language

12 The empty set symbol Ø stands for third person neuter object agreement morphology. Baker et al. argue that these are default [ϕ] feature values in Mohawk (p. 156).

typology, allowing for a syntactically-motivated interpretation of Mithun's classification (p. 165). Recall that Mithun considers intransitive agreement a characteristic of Types I and III languages and transitive agreement a characteristic of Types II and IV languages. Interpreted in FDP terms, Types I and III languages are those that prefer to delete the original copy's [ϕ] features during copy deletion, and Types II and IV languages as those that prefer to retain the original copy's [ϕ] features.[13] Further recall that Mithun's classification is cumulative. Thus we should expect the feature deletion preferences of Types III and IV languages to be slightly variable.

3.1 Issues with the FDP

Baker et al.'s interpretation of NI Transitivity Alternations is appealingly uncomplicated. But upon closer inspection, it becomes evident that there are a number of grey areas in their description of the mechanisms involved in the FDP that create issues. Baker et al. claim to ground the FDP in "current Chomskyan thought", referring to works published by Chomsky between 1995 and 2005 (2005:153). But Baker et al.'s definition of key terminology is in some ways inconsistent with the Minimalist Program described by Chomsky within this time span. In the following section, I will compare Baker et al.'s uses of the terms "trace", "copy", and "copy deletion" with those of Chomsky (2000).

13 Recall that, according to Mithun (1984), a Type III IN is anaphoric and is not accompanied by an unincorporated object, and a Type IV IN is restricting with a specifying unincorporated object. Baker et al's interpretation of feature-deleting and feature-retaining languages as Types III and IV (respectively) only applies in terms of agreement: differences in referentiality between the two types are not determined by feature deletion/retention.

3.1.1 Traces versus copies

According to Baker et al., "current Chomskyan thought" makes use of the term "trace", defining it as an element that forms in the original copy's vacated position as a result of movement (i.e., copy formation and deletion) (p. 153). But Chomsky (2000:113) actually argues that adding a trace after copy deletion violates the Inclusiveness Condition:

(13) The Inclusiveness Condition: No new features are introduced by [operations].

The trace's violation of the Inclusiveness Condition can be understood as follows. A derivation starts off with a certain set of features which may undergo changes during syntactic operations. Once syntactic operations are underway, the introduction of new features should be avoided because adding new features is less economical than making use of the constructions's original set of features. Moreover, allowing new features to be introduced compromises LF's ability to process the derivation. Based on these Minimalist aims, trace theory was replaced by copy theory.

This was not the only reason why trace theory was abandoned in favour of copy theory. Traces are defined as elements that have different properties and licensing conditions than the constituents whose vacated positions they assume (Nunes 2011:146). But there is all sorts of evidence that the element occupying the original position of the moved constituent actually contains the same content as the moved constituent.

For instance, consider the different assumptions that the two theories make about phonetic output. Trace theory assumes that traces are inherently devoid of phonetic

content, but does not explain why this is so (p. 149). This assumption wrongly predicts that it should be impossible for more than one occurrence of the moved constituent to be pronounced in the same construction. In copy theory, on the other hand, all copies are subject to the same restrictions on phonetic content, which means that the internal copy's phonetic content is only absent if it is deleted, not because it is inherently nonexistent. Thus copy theory correctly predicts that it is possible for multiple copies of a moved constituent to be pronounced. Based on these arguments and more, there was a general shift in the literature from trace theory to copy theory, a development that was not pursued by Baker et al.

This is not the only issue with Baker et al.'s use of the term trace: it is also problematic that they use the term inconsistently, combining trace-theory terminology with copy-theory terminology in a way that creates extra work for the computation. To reiterate, Baker et al. claim that "current Chomskyan thought" defines NI as copy formation, followed by copy deletion from the DO position, followed by trace formation in DO position (p. 153). In order for a copy of the object to be deleted from DO position, there must first be a copy in this position. Thus the first half of Baker et al.'s definition of NI is consistent with copy theory. They apply this interpretation to Type III languages, arguing that in such contexts, [ϕ] features belonging to the "head noun [are removed] along with its phonological features" (p. 154). Since traces do not contain phonological features to begin with, and a second copy has already formed at this point, this "head noun" must be interpreted as a copy.

This interpretation of NI is already sufficient for the feature deletion mechanism Baker et al. describe to occur. Yet they go on to say that the copy in DO position gets deleted and replaced by a trace, thus switching from copy theory to trace theory terminology. This interpretation is unnecessarily complicated: it is less efficient for the original copy to be deleted and replaced with a trace (and for [ϕ] features to detach from the original copy and reattach to the trace) than it is for the original copy to simply lose its phonological content and retain its [ϕ] features. Not only is this interpretation less efficient, it is theoretically unsupportable because it combines terms grounded in different theoretical frameworks, even more so because trace theory was abandoned long before the FDP was developed.

Another inconsistency between Baker et al.'s and Chomsky's (2000) definitions of terms is how they conceptualize copy deletion. In the FDP, only the original copy of the object gets deleted during movement, not both copies. But deletion of a single copy is impermissible under Chomsky's (2000) definition of a chain.

Chomsky defines a chain as "a set of occurrences of an object alpha in a constructed syntactic object k" (p. 116). In simpler terms, a chain is made up of multiple occurrences of a single object. Since the object remains a single, unified entity despite being present in different locations simultaneously, deletion of one occurrence of the object is equivalent to deletion of every occurrence of the object. If the FDP adhered to Chomsky's (2000) definition of a chain, then deletion of the original copy of the object

would result in deletion of the incorporated copy of the object. But if both copies are deleted, then the FDP serves no purpose.

Clearly, this is not the interpretation that Baker et al. assume. In order for the FDP to work, it must be possible for copies of chained constituents to be deleted individually. To be clear, the issue is not that Baker et al.'s interpretation of copy deletion is less efficient than Chomsky's (2000): it is that Baker et al. misleadingly claim that their interpretation of copy deletion is supported by Chomsky (2000) when in fact it is not.

Further, Baker et al. do not address what happens to the moved copy's [ϕ] features during copy formation. They do not say that object copy formation involves [ϕ] feature copy formation, which would be inconsistent with Chomsky's (2000:119) argument that feature chains do not exist. But they also do not say that [ϕ] feature copying does not occur. Thus their interpretation of what happens to features during copy formation is only consistent with Chomsky's (2000) interpretation by omission.

These terminological and conceptual issues make it hard to accept the FDP as an adequate model of NI Transitivity Alternations.

3.1.2 Operation ordering

In addition to the foundational issues discussed above, the validity of the FDP relies on an untraditional ordering of movement and agreement. Though there may be good reason to branch away from traditional assumptions about the ordering of these two operations, Baker et al. do not offer justification for their new interpretation, nor do they explore the

serious consequences that different orderings of movement and agreement have for the FDP.

In order for the FDP to work, movement (i.e., NI) must precede agreement. To understand why this is necessary, recall that Baker et al. assume that [ϕ] feature deletion or retention occurs during movement. If agreement were to precede movement, then the verb would agree with its DO before [ϕ] feature deletion from the original copy of the object could occur, leading to the incorrect conclusion that incorporating verbs must always display transitive agreement morphology. It goes without saying that a wealth of NI data exists that proves this prediction is false. On the other hand, if movement occurs before agreement, as the FDP assumes, then (in some languages) object [ϕ] features can be deleted along with the original copy of the object before the verb attempts to agree with its object. This ordering leads to the correct conclusion that NI Transitivity Alternations exist.

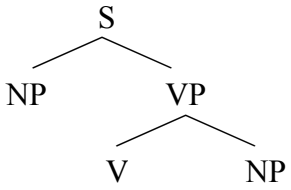
If Baker et al. are correct to interpret NI Transitivity Alternations as the result of feature deletion preferences exhibited during movement, then the ordering of movement and agreement it critical to the success of the FDP, and therefore deserves to be given particular attention. But although Baker et al. state that their central thesis is that "syntactic movement can have different effects on the features involved in agreement in different languages", they do not address the fact that this assumption challenges Baker's very own long-held assumption that agreement precedes movement (see Baker (1988, 1996) on the Morphological Visibility Condition (henceforth, the MVC) for more detail)

(Baker, Aranovich & Golluscio 2005:155). Though it might be justifiable to deviate from more traditional assumptions about the ordering of operations, Baker et al. do not provide such justification themselves. The ordering of agreement and movement is something that must be addressed if we are to assume that NI Transitivity Alternations result from a fixed sequence of syntactic operations.

3.1.3 Verb structure

Baker et al. assume that sentences have the following structure (p. 154):

(14)



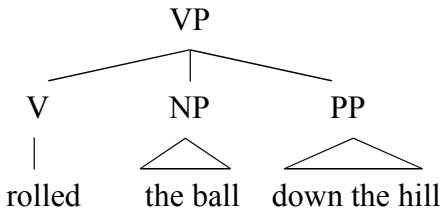
In this structure, the VP consists of a single projection with the DO in comp-VP. This structure is adequate for describing single object NI, which is what Baker et al. are concerned with. But difficulties arise when we try to apply this structure to predicates that have more than one internal argument, i.e., double object constructions. Consider the following English example from Radford (2004:337):

(15) He rolled the ball down the hill.

If we assume that the verb phrase in this sentence only has one projection, and we further assume that the external argument, *he*, occupies spec-VP in accordance with the VP

Internal Subject Hypothesis (Kitagawa 1986), then the only way for all three arguments to fit into this structure is if both objects are sisters to the verb head, as shown in (16) below:

(16)



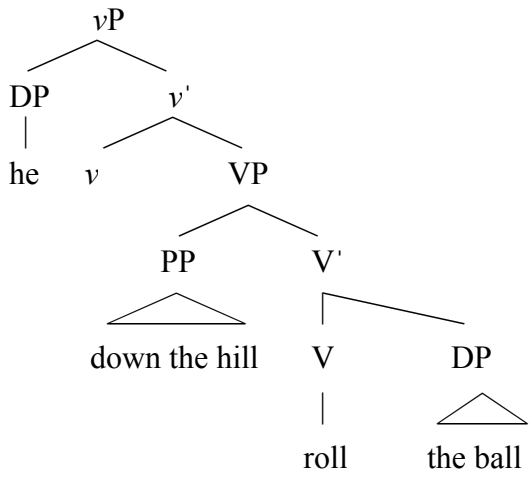
This structure is referred to as a ternary branching structure. Although ternary branching structures are acceptable in some theoretical approaches, the Minimalist Approach (which we can assume is the framework adopted by Baker et al., judging from their reference to Chomsky's more recent Minimalist works) assumes that merge is a strictly binary operation.[14] But if merge is a strictly binary operation, then it should be impossible for all three arguments in example (15) (i.e., [he], [the ball], and [down the hill]) to fit inside the verb phrase.

This becomes a non-issue if we assume that verbs have shell structure. In this interpretation, external arguments can be merged in spec-*v*P, which leaves spec-VP

14 Further support for the binary branching interpretation comes from Radford (2004:337), who points out that a ternary branching interpretation of our example sentence incorrectly predicts that the arguments "the ball" and "down the hill" do not form a constituent, and therefore cannot be coordinated with another constituent, when in fact it can (e.g., "We rolled the ball down the hill and the acorn up the mountain.").

available for indirect objects (henceforth, IOs).[15] The tree structure in (17) below applies this new interpretation to example (15) above (before verb raising):[16]

(17)



As mentioned, the verb structure assumed by Baker et al. adequately describes NI contexts that involve a single object. But as we shall see in Section 4.1 of Chapter 3, some languages allow NI in double object constructions (i.e., Double Object NI). As the above discussion has shown, it is impossible to interpret such data within a Minimalist framework unless verbs have shell structure.[17] The fact that Baker et al. do not adopt this interpretation further weakens the FDP. An adequate syntactic model of NI Transitivity Alternations must take such data into account.

15 There is some debate in the literature about where the IO and DO are merged, with some arguing that the IO originates in comp-VP position (Chomsky 1975; Larson 1988) while others argue that this position is assumed by the DO (Hale & Keyser 2002). I adopt the latter interpretation.

16 NPs are now assumed to be headed by determiners (i.e., D), hence NP is replaced with DP.

17 Double object constructions are one of many different phenomena that benefit from a verb shell structure analysis. For more information about different lines of work that led to similar conclusions, see Borer (2005a, 2005b) on event structure, Hale & Keyser (1993) on l-syntax, and Halle & Marantz (1993), to name a few.

4. Conclusion

In this chapter we have reviewed the three models of NI Transitivity Alternations that currently exist in the literature. Two of these models (Mithun 1984; Rosen 1989) are set in a lexicalist framework. I have shown that, although both of these models have been influential for Baker et al.'s syntactic model (i.e., the FDP), neither is considered an adequate model because of their lexicalist frameworks.

We have also reviewed the FDP, the only syntactic theory of NI Transitivity Alternations to date. Despite offering the most promising interpretation of these alternations so far, the FDP is undermined by a number of terminal and conceptual issues that are overlooked by Baker et al. These inaccuracies include unsupportable and inconsistent definitions of key terminology, a lack of attention to the significant consequences of the order of syntactic operations, and the adoption of inadequate verb structure.

We must conclude that we do not yet have an adequate model of NI Transitivity Alternations. But though the FDP is framed in uncertain terms, the feature deletion mechanism it describes remains intriguing. In the following chapter, I will argue that by reframing the central concepts of the FDP within a new theoretical framework, Provocative Syntax, it is possible to address the FDP's mehanical issues while preserving the model's strengths.

Chapter 3: Developing the terms of the Provocative Feature Deletion Model

1. Introduction

Despite the FDP's foundational issues, it is not necessary to entirely discard this model and start from scratch in order to create an adequate mode of NI Transitivity Alternations. I argue that it is worthwhile to build further on the FDP by placing it within a syntactic framework that can resolve its foundational issues. In this chapter, I show that Provocative Syntax is an appropriate framework within which to reconfigure the key concepts of the FDP because the FDP and Provocative Syntax are complementary models of feature valuation.[18] Two ordering issues arise from blending the concepts and terminology of each model, namely, the ordering of agreement and movement, and the ordering of agreement and Refine. In the course of providing solutions for these issues that are supported by the literature, the terms of the new model are explored in depth.

2. Provocative Syntax

In order to understand my decision to develop further on the FDP within a Provocative Syntax (henceforth, PS) framework, the reader must first understand what PS is. So we will begin by familiarizing ourselves with this new model.

In *Provocative Syntax*, Branigan separates the motivation for movement from the motivation for merge. Movement is no longer assumed to be motivated by the need to fill an empty specifier position or phrasal edge, but rather by a constituent's need to value a

18 It is possible that there are other syntactic models of incorporation that could house the main concepts of the FDP. One such model is Johns' (2007) "root movement" interpretation, which was developed to account for contexts where NI is obligatory, as is found in Inuktitut.

kind of uninterpretable feature that Branigan refers to as a "Provocative" feature (henceforth, P-feature) (p. 9). The need for the Extended Projection Principle (henceforth, EPP) is thus eliminated.[19] Provocation occurs when a constituent that contains a P-feature (i.e. a probe) finds a constituent with a matching interpretable feature (i.e. a goal) and feature valuation occurs. This feature valuation operation results in the generation of a second copy of the goal, which is subsequently merged with the probing constituent.

The way that the probe uses the goal to value its P-feature requires a little more effort to understand than simple copy formation and merge. Branigan argues that probes can only merge with goals that are outside of the phrase marker (i.e., tree) (p. 17). The only way for a nominal inside the probe's complement to act as the goal of provocation is if the probe "provokes" a second copy of the goal that exists outside of the original phrase marker. Thus provocation results in two phrase markers: one containing of the probe and the copy of the goal that is inside the original phrase marker (i.e., the internal copy) (shown in (18a) below), and one containing the copy of the goal that is outside the original phrase marker (i.e., the external copy) (shown in (18b)):[20]

(18) The two phrase markers produced in provocation contexts

a. [probe$_{head}$ + internal copy]
b. [external copy]

19 The EPP requires that every clause must contain a DP/NP in subject position. The head of the clause is assumed to carry a feature that obliges it to project a specifier. This requirement can be met by insertion of an expletive or movement of an internal argument to spec-XP (Chomsky 1981:25).

20 The subscript term "head" in (18a) is used to identify the c-commanding constituent of the phrase marker.

Provocation is successful in contexts where a second phrase marker containing a second copy of the goal is generated because the provocative head is able to value its uninterpretable feature using the matching feature of the external copy of the goal.

Now that the general idea of provocation is understood, I will describe how Branigan (2011) defines two related operations: “merge” and “Refine”.

2.1 Merge

In order for the construction created by provocation to be interpretable at PF and LF, the two phrase markers must be unified. This is done by merging the external copy of the goal in a higher position in the original phrase marker than the internal copy (Branigan 2011:7). Because the external copy of the goal c-commands the internal copy, the former is given spell-out at the PF interface (p. 9). Thus the constituent that was the goal of provocation has the appearance of having moved to a new position in the tree.

Although provocation creates a need for merge, it does not determine the positions that moved constituents merge into. And in fact there is no need for it to since the locations of merge can easily be explained by bare syntactic principles. Branigan argues that full phrases are most often merged in specifier position because it is “simply the automatic consequence of how two separate phrase markers are unified by external merge” (p. 9).

Head movement falls out from this interpretation just as simply.The P-feature involved in head movement contexts is [u-ROOT] a term that reflects Branigan's

assumption that what provocative probes lack in these contexts is root material (p. 33). Head movement is understood as a local movement operation in which a bare head is selected as a goal because phrasal movement is impossible (p. 32). Following bare phrase structure rules as defined by Chomsky (1995) and Pesetsky & Torrego (2007), a provocative probe cannot provoke its own complement phrase and remerge it as a specifier. Thus in head movement contexts, only the head of the complement phrase is selected for provocation. Unlike full phrases, bare heads cannot be merged as specifiers (Branigan 2011:34). So the head of the probe's complement phrase merges with the probe itself rather than in specifier position.

NI (which is a kind of head movement) involves the following steps (p. 35). The provocative verb searches its complement for a goal containing a valued [ROOT] feature. The verb finds the [ROOT]-bearing DO, which heads the verb's complement. Because the probe cannot remerge its complement as a specifier, it provokes a second copy of the head of its complement outside the original phrase marker, which is subsequently merged inside the verb complex and given spell-out at PF.

2.2 Refine

Provocation creates a chain relationship between the probe and the two copies of the goal because they now share identical [ROOT] material (Branigan 2011:30).[21] Chains will be illustrated as follows:

(19) [probe external goal internal goal]
[ROOT$_i$] [ROOT$_i$] [ROOT$_i$]

At this stage, chain formation creates a problem. The derivation will crash unless the probe's P-feature is valued, an issue that is resolved by provocation. But the derivation will also crash if the tree contains multiple copies of matching features, a problem that arises from the formation of chains through provocation. Thus, in order to avoid the latter issue, the chain must be modified before Transfer.

Branigan argues that these chain modifications occur during an operation referred to as Refine, which occurs before transfer to PF and LF. The chain is modified by a "complementary deletion procedure" that deletes a different kind of content from each

21 There is some debate in the literature about how soon uninterpretable features are deleted after valuation. This debate stems from the following question: how can a blind grammar distinguish between original and copied features? Chomsky's (2008:21) solution is that uninterpretable features get deleted immediately after valuation. Pesetsky & Torrego (2007) argue that there is only one feature that is shared between multiple positions. These interpretations have different consequences for Branigan's (2011) interpretation of chains undergoing Refine. If, following Chomsky (2008), we assume that feature valuation immediately cancels out the probe's uninterpretable P-feature, then the probe cannot be a component of the chain undergoing Refine because it does not contain the feature that connects it to the other components of the chain. If, on the other hand, we adopt Pesetsky & Torrego's (2007) interpretation of feature valuation as "feature sharing", then the probe is part of the chain because it contains one occurrence of the feature it shares with the two copies of the goal. But then it is impossible to delete single occurrences of the feature from different components of the chain. Branigan's (2011) interpretation of Refine is fairly consistent with Chomsky's (2008). But instead of assuming that the uninterpretable P-feature is deleted immediately after valuation, Branigan assumes that it sticks around long enough to become part of the chain. I argue in favour of Branigan's interpretation.

component of the chain (p. 30). This deletion procedure makes it impossible for individual components of the chain to stand on their own. But since different elements have been deleted from each chained component, together they add up to a single whole that both maintains the chain relationship and makes the construction interpretable at LF. In other words, the components of a chain must become interdependent for the chain to survive.[22]

Branigan illustrates the Refine operation with the following example of wh-movement: "I wonder which book Shelby was reading" (p. 30). Provocation of an external copy of the wh-phrase "which book" creates a chain relationship between the probe C, the external copy "which book$_{external}$" and the internal copy "which book$_{internal}$" because each contains a matching [wh] feature. In order for the chain to be interpretable at LF, each component loses a different part of its content: C loses its [wh] feature,[23] the external copy loses its predicational material (wh *x*), and the internal copy loses its operator content (*x*: book (*x*)) (p. 30). In (20a) below, we see the chain before Refine has taken place. (20b) shows what the chain looks like after Refine wipes out different content from each component of the chain.

22 Branigan's (2011) interpretation of deletion from chains avoids eliminating chains but conflicts with the Chomsky (2000) definition of chains, which predicts that it should be impossible to delete a single copy from a chain without deleting all copies. Thus for Branigan's interpretation to work, we must accept that copies of repeated content can be deleted individually.

23 Once the [wh] feature is deleted from C, there is nothing that ties C to the other components of the chain. Thus C is immediately eliminated from the chain once its [wh] feature is deleted (Branigan, p.c.).

(20) A wh-movement chain before and after Refine (Branigan 2011:30)

a. before Refine: (C [wh] , which book$_{external}$ [wh] , which book$_{internal}$ [wh])

b. after Refine: (C , wh *x* , *x*: book (*x*))

Immediately after Refine, the chain is sent to the PF interface for spell out, inalterably fixing the phonetic form of the components of the chain (p. 30). In order to keep open the possibility that the phonetic form of chained constituents may be influenced by subsequent operations, it is assumed that Transfer occurs when all other syntactic operations are complete.

Now let us add Refine to the PS interpretation of object NI that was given in Section 2.1 above. In NI contexts, the provocative probe is the verb and the goal of provocation is the DO, which is the head of the verb's complement phrase. Provocation results in the formation of a chain that consists of the verb and two copies of the object, all of which contain matching P-features. Before Transfer, a Refine operation wipes out different elements from each of these three components in such a way that they remain interdependent.

Keep in mind that, though the chain undergoing Refine was created by provocation, P-features are not the only identical elements in the two copies of the object: they also have identical phonetic forms. Thus in addition to deleting P-features from one copy of the object, Refine deletes one copy's phonetic form as well. As mentioned at the end of Section 2.1 above, the external copy of the object (i.e., the one that merges inside

the verb complex) is the one to receive spell-out, which in PS terms means that the phonetic form of the internal copy is deleted during Refine.

To recap, PS defines movement as P-feature valuation. Different P-features occur in different movement contexts. Because P-feature valuation must occur between the probe and an external goal, the probe provokes an external copy of its object and uses this external copy for feature valuation (Branigan 2011:17). The phrase marker containing the external copy is unified with the original phrase marker through merge in order for the derivation to avoid crashing. The P-feature involved in head movement contexts, including NI, is [u-ROOT]. Since the goal of provocation in NI contexts is a bare head, it cannot be merged as a specifier and must therefore be merged inside the verb complex instead.

3. Compatible aspects of the FDP and the PS model

Now that we are familiar with the terms of the PS model, we can compare them with the terms of the FDP and observe how well they may fit together as a unified model of NI Transitivity Alternations.

I argue that PS is an appropriate model in which to frame the feature deletion mechanism of the FDP because these models are concerned with the valuation of different kinds of uninterpretable features: the FDP is concerned with [ϕ] feature valuation, and PS is concerned with P-feature valuation. Crucially, neither model provides an in-depth description of the phenomenon that the other is concerned with,

(although both models contain assumptions about the ordering of operations, which will be discussed in Section 4). Since the two models complement one another on such a general level it seems plausible that they could form a unified model, with movement motivated by P-feature valuation and agreement motivated by [ϕ] feature valuation. I will refer to this blended model as The Provocative Feature Deletion Model (henceforth, the PFDM) to reflect the fact that it combines the feature valuation procedures already introduced by these two models.

In order for the key concepts of the FDP to fit within a PS framework, we must adapt the FDP to fit PS terminology. Below, I will lay out the new definition of each key term.

Baker et al. interpret movement as the merge of an external copy of a constituent or phrase in a higher position in the tree (p. 154). Baker et al. have no reason to define the motivation for movement because they are only concerned with what happens during and after movement. But PS fills in this blank: the motivation for movement is P-feature valuation, which means that movement is now defined as provocation. In NI contexts, provocation creates two copies of an object that merge in different locations in the tree: the external copy merges inside the verb complex and the internal copy remains in situ. Thus what Baker et al. call a trace is now defined as the internal copy of the object.

The key concept of the FDP is that [ϕ] features can either be carried along with the moved object or left behind in the trace. Redefined in PS terms, this means that [ϕ] features can either be deleted from or retained in the internal copy of the object. So

instead of saying that the verb agrees with the object's [ϕ] features if they are left behind in the trace, we will now say that object agreement occurs when [ϕ] features belonging to the internal copy of the object remain available for agreement. Thus as you can see, the main mechanism of the FDP is unaltered in PS terms.

Next, we need to figure out what is responsible for determining whether or not the internal copy's [ϕ] features remain available for agreement. According to Baker et al., the presence or absence of [ϕ] features in the moved object's original position is determined during movement: the object's [ϕ] features are either deleted or remain in the trace (p. 153). As mentioned in Chapter 2 Section 3.1.1, Baker et al. do not specify whether or not there is a set of [ϕ] features contained in the copy that attaches to the verb head. But in PS terms, it is explicitly stated that both copies of the object contain a set of [ϕ] features (Branigan 2011:30). Crucially, if two copies of the object with matching [ϕ] features are the result of movement (i.e., provocation), then feature deletion/retention must occur *after* movement.

Recall from Section 2.2 of this chapter that provocation results in the formation of a chain containing three components with matching features: the provocative probe, and two copies of the provoked goal. Branigan (2011) argues that this chain undergoes Refine to wipe out identical content that would otherwise cause the derivation to crash at PF and LF. Since the purpose of Refine is to clean up chains by deleting repeated content, it I hypothesize that the [ϕ] feature deletion that is responsible for creating NI Transitivity Alternations occurs during Refine as well.

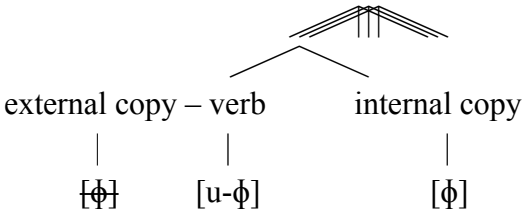
In fact, if we accept the possibility that Refine occurs earlier in the derivation than previously assumed (i.e., before agreement), then the PS model would already predict that Refine affects object agreement. This is because one of the two copy's identical set of [ϕ] features must be deleted during Refine anyway in order for the derivation not to crash. If Refine precedes agreement, then NI Transitivity Alternations are a natural consequence of Refine's deletion of [ϕ] features to clean up chains. Thus [ϕ] feature deletion may actually serve an important purpose: to make chains interpretable by deleting repeated content. In this new interpretation, we can not only identify an operation that is potentially responsible for [ϕ] feature deletion, but also identify its motive for doing so.

In Branigan's (2011) definition of Refine, it does not seem to matter which set of identical features is deleted as long as the chain relationship is maintained. Applied specifically to [ϕ] features in NI contexts, this means that [ϕ] features can be deleted from either copy of the object rather than just the internal copy (as Baker et al. assume). Deletion of the external copy's [ϕ] features makes it necessary for the internal chained copy's [ϕ] features to be retained in order to maintain the chain relationship between them. For the same reason, [ϕ] features must remain in the external chained copy if [ϕ] features are deleted from the internal copy.

Just like in the FDP, object agreement can only occur if a set of [ϕ] features remains inside the verb's c-command domain, which, in PFDM terms, means that [ϕ] features belonging to the internal copy of the object survive Refine. The simple

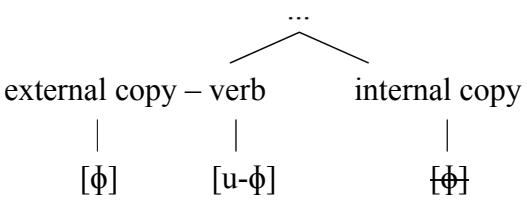
schematization in (21) below shows the tree immediately after deletion of the external copy's [ϕ] features from the chain during Refine:[24]

(21)



Since [ϕ] features remain in the internal copy, which is located within the verb's c-command domain, object agreement takes place. If, on the other hand, [ϕ] features remain in the external copy (which is outside of the verb's c-command domain), then object agreement is impossible because there are no [ϕ] features left in the verb's c-command domain with which the verb can agree. The latter scenario is schematized in (22) below:

(22)



Deletion of the internal copy from the chain deactivates the internal copy's [ϕ] features in the tree, making them unavailable for object agreement. Further, the active [ϕ] features belonging to the external copy are outside of the verb's c-command domain because the external copy has merged within the verb complex. Thus, object agreement cannot occur.

24 Since we have not yet addressed verb structure in PFDM terms, the structures in (21) and (22) are intentionally limited to illustrating the structural relationship that exists between the verb and two copies of the object at this stage in the derivation. Verb structure is addressed in Section 4.1 below.

Let us recap the adjustments we have made so far. We translated into PS terms Baker et al.'s definition of movement, added the Refine operation to the discussion, reconfigured the timing of feature deletion, and found a motivation for feature deletion. None of these adjustments altered Baker et al.'s foundational claim that movement can have different effects on agreement in different languages, or the feature deletion mechanism by which NI Transitivity Alternations are obtained in the FDP. Assuming that the feature deletion which creates NI Transitivity Alternations occurs during Refine, and further assuming that Refine can precede agreement, the model predicts that agreement alternations are a natural consequence of the need to clean up chains for Transfer.[25] Now let us see if we can find support for the latter assumption and resolve the tension between some of the less congruous aspects of the FDP and PS.

4. Incompatible aspects of the FDP and the PS model

Although the PS model and the FDP are complementary in a broad sense, the two models make opposite assumptions about the ordering of movement and agreement, an issue that could make or break the PFDM. To resolve this issue, I argue that Branigan's (2011) "add-as-needed" interpretation of P-features makes it possible to obtain either ordering of agreement and movement in PS (and therefore PFDM) terms. Following this, we must address the fact that the PFDM only predicts the existence of NI Transitivity Alternations if agreement is preceded by both movement and Refine. In order to ensure that this

25 As will be discussed in Section 4.1.3, this interpretation of NI is only possible if Refine occurs before agreement rather than immediately before Transfer.

correct ordering is obtained, the context and function of Refine is explored in greater detail.

4.1 Clashing orders of agreement and movement

The most obvious difference between the PS model and the FDP is the ordering of agreement and movement. As discussed in Chapter 2 Section 3.1.2, the FDP only predicts the existence of NI Transitivity Alternations if movement precedes agreement. If object agreement takes place before [ϕ] feature deletion can occur during NI, then all incorporating languages would display transitive agreement in NI contexts. This prediction is clearly inaccurate. Thus in order for the FDP to serve a purpose, it must be assumed that movement precedes agreement.

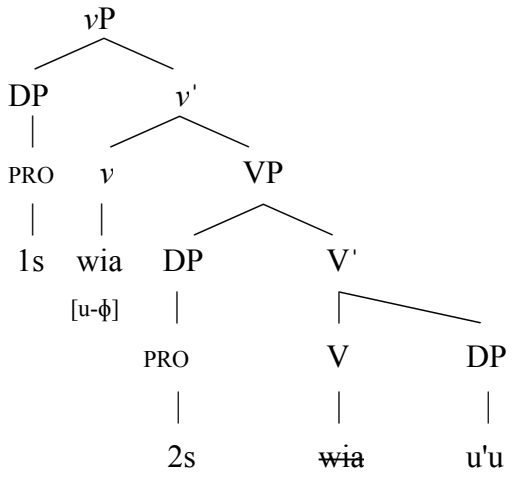
But now we find ourselves faced with a problem because PS is built on the assumption that agreement precedes movement. This assumption is revealed in Branigan's (2011:37) interpretation of Double Object NI in Southern Tiwa. The example he uses to illustrate this interpretation is shown in (23) below. Notice that the verbal agreement morpheme *-ka-* indicates that the verb has agreed with the IO "you", and that the DO "baby" has been incorporated:

(23) Double Object NI in Southern Tiwa (Allen, Gardiner & Frantz 1984:303)

Ka-'u'u-wia-ban.
1s|2s|A-baby-give-PAST
"I gave you the baby."

Branigan implies that the second person singular IO (which is not given a phonetic form) is located in spec-VP, which makes it higher in the tree than the DO prior to incorporation. The IO is thus the nominal closest to *v*, which contains [u-ϕ] features. The tree diagram in (24) below shows this verb structure after V has raised to *v*, but before object agreement or NI have occurred:

(24)



Branigan (2011:37) offers the following interpretation of this data. First, *v* agrees with and assigns object Case to the closest nominal, which is the IO "you". But it cannot agree with the DO *wia* "baby" because verbs in Southern Tiwa only have a single object Case to assign. Consequently, the DO cannot be θ-licensed by agreement.[26] But since NI is generally considered a θ-licensing operation, Branigan argues that an [u-ROOT] feature

26 The presence of portmanteau agreement with the DO (indicated by the gloss A (i.e., Class A gender) is a can of worms that Branigan (2011) leaves unopened, as shall we.

is generated in *v* after object agreement takes place. The DO is thus incorporated into *v* to compensate for the absence of a second object Case.[27]

Branigan's interpretation of Southern Tiwa Double Object NI reveals his assumption that object agreement not only precedes NI, but determines whether or not NI need occur.[28] It further reveals his assumption that both [u-ROOT] and [u-ϕ] features are generated in *v*.[29]

The ordering of agreement and movement appears to be a serious point of contention between the two models. On the one hand we have Baker et al.'s assumption that movement precedes agreement, which we cannot change without eliminating the purpose of the FDP. On the other hand we have Branigan's (2011) assumption that agreement precedes movement, which is equally crucial to his interpretation of Double Object NI in Southern Tiwa. So which ordering of operations will allow the feature deletion mechanism of the FDP to be framed in PS terms?

4.1.1 The ordering of agreement and movement in the PFDM

Ideally, the PFDM should require as few alterations to the FDP and PS as possible. But since the FDP and PS are both built on the assumption that syntactic operations occur

27 As was discussed in Chapter 2 Section 3.1.3, Baker et al. do not assume that verbs have shell structure. This assumption makes it impossible to interpret the data in (23) because there is no place for the IO to adjoin to the verb. The PFDM will therefore adopt Branigan's (2011) assumption that verbs have shell structure, and further, that NI and object agreement both take place at the *v*P level.

28 The assumption that incorporation follows agreement is widely held. Roberts (2010), for example, interprets NI as a reflex of Agree.

29 Branigan also investigates the possibility that [u-ROOT] is generated in lexical V rather than little *v* (2011:36). But if provocation occurs at lexical V and agreement occurs at *v*, then movement would necessarily precede agreement. Branigan (p.c.) makes it clear that Branigan (2011) assumes the opposite ordering. Thus, I will continue to assume that both [u-ROOT] and [u-ϕ] features are contained in *v* in the PS model.

cyclically, the PFDM will not work unless the ordering of operations assumed by one of these models is modified to match that of the other.[30] Since the assumption that movement precedes agreement is the backbone of the FDP, our first step is to find out if the PS model can support a movement-before-agreement ordering of operations as well. In fact, support for this ordering comes from the PS model itself, namely, from Branigan's (2011) definition of P-features.

Branigan broadly defines P-features as the features that motivate movement (7). Branigan's P-features are an extension on Chomsky's (2000) Periphery Features. Chomsky defines Periphery Features as uninterpretable features existing at the periphery of phases which allow elements to move outside of the phase (2000:108).[31] Chomsky's Periphery Features are in fact a subtype of Branigan's (2011) P-features, which are defined as the features that motivate movement of any kind, including (but not limited to) movement outside of a phase.

Crucially, both Chomsky (2000) and Branigan (2011) assume (respectively) that Periphery Features and P-features can be added to a derivation as needed. Chomsky's Periphery Features are only added if something needs to move outside of the phase (2000:108). Similarly, Branigan interprets optional incorporation as the option to add a P-

30 It could be argued that syntactic operations do not occur cyclically, which may make it possible for the models to be blended a different way. Since, however, both the FDP and PS assume that operations occur cyclically, I will leave this line of thought for others to pursue.

31 See the discussion of object shift in Chomsky (2001) for further support of the idea that features can be added as needed.

feature when it is needed (2011:37).[32] In other words, Periphery Features and P-features only enter derivations when they have an immediate purpose to serve.

The assumption that P-features can enter a derivation as needed makes it possible to argue that movement can precede agreement in the PS model. If we further assume that P-features must be dealt with as soon as they enter the derivation (see Section 4.1.2 below for justification of this interpretation), then the timing of movement relative to other operations simply depends on when a P-feature gets added. Thus movement must precede agreement if a P-feature is added to a derivation before agreement occurs. But movement must follow agreement if a P-feature is added to the derivation after agreement occurs.

This "add-as-needed" interpretation of P-features implies that it should be possible for the ordering of operations to vary between and within languages. In other words, it should be possible that different languages allow P-features to enter the derivation at different stages. It also should be possible that, within a given language, P-features can be added at different stages in different contexts. If this interpretation of P-features is correct, then perhaps incorporating languages add P-features before agreement in NI contexts, but after agreement in other types of movement contexts.

In conclusion, by defining P-features as uninterpretable features that get add-as-needed, Branigan (2011) makes it possible for the PS model to support a movement-before-agreement ordering of operations in NI contexts. Thus there is no need to alter the order of operations assumed by the FDP in order to create the PFDM.

32 Unlike Chomsky (2000) for Periphery Features, Branigan (2011) does not stipulate that P-features occur at the edges of phases only. My own model will adopt Branigan's definition of P-features in this respect.

4.1.2 The hierarchy of uninterpretable features

In the previous section, I showed that the ordering of movement and agreement depends on when a P-feature is added. If a P-feature is added before agreement takes place, movement precedes agreement. But what if a P-feature is added to the verb at the same time as [u-ϕ] features? Which feature type does the verb deal with first?

I propose that the valuation of some uninterpretable features takes precedence over the valuation of others. I further propose that P-feature valuation is ranked as the highest priority. Thus a probe that contains both a P-feature and a set of [u-ϕ] features must deal with its P-feature first. A simple schema of the hierarchy I am suggesting is shown in (25) below:

(25) The hierarchy of uninterpretable features: P-features < [u-ϕ] features ...

This hierarchy ensures that movement precedes agreement in cases where the probe contains both a P-feature and a set of [u-ϕ] features.

The priority of P-features is supported by a substantial literature on cases where agreement does not need to occur in order for a derivation to survive. A common theme in the literature is that some languages want agreement to happen if it can, but have other ways to survive if it cannot. For instance, take languages in which an object can be incorporated but not agreed with, as we saw in the Southern Tiwa example in (23) above. Another example is Icelandic, which exhibits "quirky" subject agreement when regular agreement is impossible (Boeckx 2000).

The optional expression of agreement is a common theme in theoretical linguistics. Baker (1988, 1996) developed the MVC to account for the absence of agreement in relation to NI, a theory that has been widely adopted by advocates of syntactic interpretations of NI every since (including Branigan's (2011) interpretation of example (23) above). Preminger (2014:1) argues that although agreement is an obligatory operation triggered by the grammar, the grammar does not ensure its "successful culmination". Spencer (1995) supports the idea that a verb's transitivity is "suppressed" rather than eliminated in contexts where it cannot be expressed by agreement. All of these studies and more support the interpretation that [u-ϕ] feature valuation should be ranked lower then P-feature valuation.

The arguments I have provided in Sections 4.1.1 and 4.1.2 lead me to conclude that the PS model is flexible enough to support a movement-before-agreement ordering of operations in NI contexts. In these contexts, movement must precede agreement because the valuation of *v*'s [u-ROOT] feature is prioritized over the valuation of its [u-ϕ] features.

4.1.3 Adding Refine to the operation ordering issue

In Baker et al.'s terms, it is enough to simply say that movement must precede agreement because they consider feature deletion/retention to be part of the movement operation. But if we are to assume a PS framework, it is not enough to say that NI Transitivity Alternations fall out from the ordering of these two operations alone because, as I have argued in Section 3 of this chapter, it makes sense that feature deletion occurs during

Refine in PFDM terms. Thus our next step is to determine when Refine occurs relative to these two operations.

Determining the ordering of movement and Refine is easy. Refine must follow movement because the purpose of Refine is to clean up the chains created by movement. We also already know that Refine must precede object agreement in order for Refine's feature deletion function to have an effect on agreement. But knowing that the PFDM depends on this ordering of agreement and Refine is not a reason to adopt this interpretation. In order to do so, we either need to find support from the literature or provide a solid argument for this new interpretation.

Support from the literature is hard to find. Branigan (2011:30) assumes that Refine takes place when all other operations are complete in order to clean up chains for Transfer. If this interpretation is correct, then Refine cannot be responsible for creating NI Transitivity Alternations because agreement would occur before feature deletion is possible. This interpretation brings us back to square one. So before we adopt Branigan's assumption about the timing of Refine and start all over again, we will first try to find a reasonable justification for this new ordering that has not yet been suggested. To do so, we must understand what a Refine operation actually is.

4.1.3.1 What is Refine?

The easiest way to deepen our understanding of Refine is to compare it with the operations we are already familiar with, namely movement and agreement. The most

obvious difference between Refine and movement/agreement is that Refine operates on chains whereas movement and agreement operate on trees. Operations on trees have the ability to directly manipulate the structure of trees and the constituents contained within them. But as is apparent from the name, operations on chains directly affect chains, not trees. In order to understand how Refine's ability to delete features from chains affects components in the tree, we first have to understand the relationship and differences between chains and trees.

Trees are the syntactic structures in which constituents and features are assembled and disassembled. Trees have actual syntactic content and substance because they are what undergo structural change. Chains, on the other hand, are only used to describe the relationship that exists between the constituents of a tree that share matching features. The syntactic content that a chain describes the relationships of does not simultaneously exist in both the tree and the chain: the chain inherently lacks substance. I will henceforth use the term "(in)substantiality" to refer to the presence or absence of structural content.

(In)substantiality appears to be the key difference between operations on chains and operations on trees. Operations on trees have the power to enforce structural change within the tree because they function directly on the tree's content. They also have the power to directly impact chains. Take for instance, provocation, an operation that functions on trees and creates chains as a bi-product. Operations on chains, on the other hand, do not carry as much clout: their direct influence is limited to the boundaries of the

chain under effect. They cannot directly create structural change within the actual tree because chains are inherently insubstantial.

This interpretation has significant consequences for Refine. If Refine operates on the components of a chain, but lacks the power to affect those constituents in the tree, then how are the results of Refine felt in the tree? More specifically, how can we characterize the role played by Refine in the production of NI Transitivity Alternations?

My solution is to picture Refine as a set of lenses through which all subsequent operations on trees must be filtered. These lenses have the power to "block" certain content while allowing other content to filter through, thus controlling what information is used by subsequent operations. These lenses must also apply at Transfer to PF and LF so that whatever was blocked does not suddenly become visible at the interfaces.

Picture Refine as a phoropter (the multi-lens instrument used by optometrists during eye examinations) that has lenses through which each chained component is visible in the tree. Now imagine that Refine's ability to delete features from a chain is like placing a block over individual lenses on the phoropter. Finally, imagine that a syntactic tree is projected on the wall and that you, reader, are a set of [u-ϕ] features, sitting in a chair facing this wall. When the phoropter is placed between you and the tree, you will see the parts of the tree that the phoropter allows you to see. But if a lens, say, the lens for object [ϕ] features, is blocked, you will not be able to trigger provocation.

The argument I am trying to make with this bizarre metaphor is that features deleted from chains are not deleted from trees, but rather blocked from participating in

any subsequent syntactic operations and effectively invisible at PF and LF. This metaphor helps us characterize the kind of influence that chain operations may have on trees. But Refine is not literally a phoropter set between trees and features which motivate syntactic operations (nor does it seem likely that [u-ϕ] features can sit on chairs). We still need to describe the function of Refine in its own terms.

Once again, we will refer to Refine as an operation that deletes matching feature copies from chains. Further, we will continue to assume that features are deleted in such a way that the elements of the chain remain interdependent. Added to this is the premise that features that are deleted from chains by Refine become unavailable for future operations in the tree. Below we will see how NI Transitivity Alternations are interpreted by the PFDM with this new idea in place.

Keep in mind that we are concerned with are chains created by provocation, which means that the components of the chain are the constituents of the tree that share matching [ROOT] features (i.e., the material that a probe seeks in head movement contexts). Remember as well that we are assuming object agreement occurs after provocation (i.e., movement) and Refine have taken place.[33] Finally, remember that we are only concerned with what happens to matching copies of [ϕ] features in the chain created by provocation.

33 I have yet to prove that Refine precedes agreement. This is addressed in Section 4.1.3.2. For now, it is only important to understand the consequences of this assumption.

If we adopt Branigan's (2011) assumption that a provocative probe's newly valued [u-ROOT] feature sticks around long enough to become part of the chain (see Footnote 21), chains created by provocation can be schematized as follows:[34]

(26) (*v* , $\text{object}_{\text{external}}$, $\text{object}_{\text{internal}}$)
[U-ROOT] [ROOT] [ROOT]
[u-ϕ] [ϕ] [ϕ]

In this scenario, *v* is the probe that contains [u-ROOT], and its DO is the goal of provocation. Thus the chain is made up of elements that contain matching [ROOT] features. The two copies of the object also contain identical sets of [ϕ] features, and therefore need to be cleaned up by Refine. But notice that the verb's [u-ϕ] features still have no value because agreement has not yet taken place and therefore cannot be wiped out by Refine. Thus we are only concerned with what happens to the matching sets of [ϕ] features contained in the chain created by provocation. Consequently, I will draw chains as is shown in (27) from now on, with the verb present only to remind us that this is a chain created by provocation:

(27) (*v* , $\text{object}_{\text{external}}$, $\text{object}_{\text{internal}}$)
[ϕ] [ϕ]

The phoropter metaphor translates into technical terms as follows. Instead of saying that incorporating languages show different preferences for which "feature lens" to

34 For now, assume that all sets of [ϕ] features in a chain are identical. This assumption will be challenged in Chapter 5.

block during Refine, we will now say that some incorporating languages prefer to delete [ϕ] features from the internal copy during Refine, whereas others prefer to delete [ϕ] features from the external copy. It is crucial to keep in mind that feature deletion occurs in the chain, not the tree.

Let us imagine that we are observing a language that prefers to delete the [ϕ] features that belong to the external copy of the object, as shown in (28):

(28) (*v* , $\text{object}_{\text{external}}$, $\text{object}_{\text{internal}}$)
[~~ϕ~~] [ϕ]

When the external copy's [ϕ] features are wiped out from the chain, these features become deactivated in the tree.[35] The internal copy's [ϕ] features, on the other hand, survive Refine and therefore remain active and available for future operations. This means that if *v* tries to value its [u-ϕ] features after Refine, it will find a set of active [ϕ] features in the internal copy of the object with which to agree. This context correlates with Mithun's (1984) Types II and IV languages.

Now let us see what happens when [ϕ] features are deleted from the internal copy in the chain, as shown in (29):

(29) (*v* , $\text{object}_{\text{external}}$, $\text{object}_{\text{internal}}$)
[ϕ] [~~ϕ~~]

35 I do not mean to suggest that the phonetic forms of chained constituents are unalterable following Refine. I assume that Transfer occurs at the end of each phase and that PF uses all of the information that is available within each phase to determine the phonetic forms of each constituent. When Refine deletes elements from a chain, those elements are simply no longer part of the information that is "visible" at PF and LF.

When [ϕ] features are deleted from the internal copy in the chain, it deactivates the [ϕ] features in the internal copy in the tree, making them unavailable for object agreement in the future. The external copy's [ϕ] features remain active, but since they are merged inside *v* (which is outside *v*'s c-command domain) they are unavailable for object agreement. Consequently, in contexts where [ϕ] features are deleted from the internal copy in the chain, object agreement cannot occur. This context correlates with Mithun's (1984) Types I and III languages.[36]

We now have a clear definition Refine and the role it plays in the creation of NI Transitivity Alternations, that is, if syntactic operations occur in the following order: provocation > Refine > agreement. But we still need to provide a concrete reason for assuming that this order of operations.

4.1.3.2 When does Refine occur?

I propose that a Refine operation occurs as an automatic reflex of provocation. This interpretation ensures that Refine immediately follows provocation (i.e., movement), rather than immediately precedes Transfer. In order to distinguish the reflexive Refine operation instigated by provocation from any other possible Refine operations (a possibility that I leave for others to explore), I will henceforth refer to it as Reflex Refine. Interpreting Reflex Refine as a reaction to provocation is all that is needed to obtain the correct ordering of Refine and agreement.

36 For now, we will adopt Branigan's (2011) assumption that the two copies of the object are phonetically identical and that the internal copy's phonetic material is deleted during Refine. In Chapter 5, I will argue that this assumption does not apply to all NI contexts.

From a Minimalist perspective, assuming that Reflex Refine occurs between provocation and agreement does not bog down the construction with excess operations because Reflex Refine operates on chains, not trees. Agreement is still the next syntactic operation to occur after provocation because Reflex Refine takes place outside the tree.

Here is another metaphor we can use to explain why this ordering of operations is necessary. Picture a syntactic tree as a human body and a chain as part of the body's nervous system. Now imagine that this body, we'll call him Steven, strikes his cubital tunnel where the ulnar nerve passes through his arm, i.e., his funny bone. Hitting his funny bone creates an instantaneous reaction of the nerves that cannot be interceded by another body movement. It is impossible for Steven to pause and tie his shoes before a wave of strange tingles shoots up his arm.

Now let us translate this into PFDM terms. Think of provocation as hitting Steven's funny bone. This operation automatically triggers a Reflex Refine operation, exactly like the involuntary neural impulse that hitting a funny bone creates. And lastly, think of agreement as tying Steven's shoes. Just as Steven cannot adjust his footwear before feeling funny, agreement cannot take place until Reflex Refine is complete.

5. Conclusion

I conclude that PS is an appropriate model to blend with the FDP. These models are complementary in a broad sense because they are both models of feature valuation that apply to NI contexts and because they fill in each other's blanks: the FDP accounts for agreement and PS accounts for movement.

The only serious point of contention between the two models is that they are based on opposite assumptions about the ordering of agreement and movement. In order for the PFDM to predict the existence of NI Transitivity Alternations, movement must precede agreement. But PS is built on the assumption that movement follows agreement. The solution is provided by Branigan (2011) himself, who interprets P-features as uninterpretable features that get added to the derivation as needed. Building on this idea, I proposed that, in NI contexts, [u-ROOT] feature valuation is prioritized over the valuation of other interpretable features, making it obligatory for provocation to precede agreement, even when *v* contains both [u-ROOT] and [u-ϕ]. Consequently, movement precedes agreement when a [u-ROOT] feature and a set of [u-ϕ] features are simultaneously present in *v*. Since both the FDP and PS can support the assumption that movement precedes agreement, the main operation ordering issue is resolved.

A second ordering issue arose from the fact that the Refine operation is a key element of the PS model, an operation that does not exist in FDP terms. I have argued that the feature deletion that creates NI Transitivity Alternations occurs during Refine, an interpretation that only works if Refine also precedes agreement. In order to be certain that this ordering is correct, we needed to deepen our understanding of Refine. It was revealed that there is a crucial difference between chains and trees (i.e., (in)substantiality), which implies that there is a crucial difference between how chain operations and tree operations are felt in the tree. This difference between operations on chains and trees is the key to understanding why Refine must precede agreement: Refine

is an automatic reflex of provocation that cannot be interceded by other operations on trees (hence the new name, Reflex Refine). This definition ensures that the correct ordering of operations is obtained: provocation > Reflex Refine > agreement.

Since the main elements of the FDP and PS can work together in a unified model, we can conclude that a PFDM interpretation of NI Transitivity Alternations is worth pursuing. We can now use the PFDM framework to explore in greater detail how these alternations are obtained in different incorporating languages.

Chapter 4: NI Transitivity Alternations in the PFDM

1. Introduction

This short but crucial chapter sews together all the loosely-joined pieces of the PFDM that were introduced in Chapter 3 and applies this more concise description of the new model to real language data. Our goal is twofold: to see how well the PFDM applies to real language data and to determine how strict a given language's Reflex Refine deletion preferences are.

For the time being, we will focus on the least complex type of documented NI pattern: single object NI, where only the incorporated copy of the object is visible (henceforth Generic NI). There are many NI contexts that are more complex than Generic NI, a couple of which we will explore in Chapters 5. The current chapter gives the reader a firm grasp on the basic principles of the PFDM and its application to the simplest form of NI, which can then be used to explore more complex NI contexts.

2. The PFDM, simplified version

In Chapter 3, I argued that NI is a movement operation that precedes agreement.[37] I introduced the basic concepts of the PFDM and spent a considerable amount of time justifying my interpretation of terms. But I have not yet boiled it down to its essence. To save the reader from having to do unnecessary leg work, I will take the time here to

37 It is possible that NI is not the only type of movement operation that precedes object agreement. Further, other kinds of movement operations may occur after object agreement. I leave these possibilities for others to explore.

provide a concise summary of the PFDM. The reader can then use this summary as their main reference for the model.

The PFDM combines the basic principles of the FDP with those of the PS model. This combination results in the following definition of terms. Object NI is interpreted as provocation, a movement operation that results from the valuation of a provocative [u-ROOT] feature contained in *v*. Like provocation, object agreement refers to the valuation of uninterpretable features present in v, in this case [u-ϕ] features.

Object NI takes place as follows. First, an [u-ROOT] feature is generated in *v*. A set of [u-ϕ] features may be generated in *v* simultaneously, but this does not cause an interference because the valuation of P-features is prioritized over all other types of uninterpretable features. In order to value its [u-ROOT] feature, *v* searches its complement for a constituent bearing [ROOT] material and finds that the DO is the closest appropriate goal. *v* provokes an external copy of the DO, which creates a chain relationship between the verb and both object copies because they now share matching [ROOT] features.

Although the derivation cannot survive without this chain relationship, it also cannot survive if identical features are left in different locations of the tree. To fix this, a Reflex Refine operation occurs as soon as the chain forms. Reflex Refine cleans up the chain by deleting multiple copies of matching features in such a way that the chained components become interdependent. A feature that is deleted from the chain becomes deactivated in the tree,and thus unavailable for future operations.

Identical sets of [ϕ] features are one of the things that need to be "cleaned" in the chain. These matching [ϕ] feature sets are hosted by the internal and external copies of the object (remember that *v* still contains [u-ϕ] features because agreement has not yet occurred). Refine has the option to delete [ϕ] features from either the internal or the external copy of the object. If it deletes [ϕ] features from the external copy, the [ϕ] features in the internal copy remain active in the tree. Consequently, when the verb tries to value its [u-ϕ] features following Reflex Refine, it finds a set of [ϕ] features available for object agreement. If, on the other hand, Reflex Refine deletes [ϕ] features from the internal copy in the chain, then these features become deactivated in their corresponding position in the tree, making object agreement impossible.

[ϕ] feature deletion occurring during Reflex Refine is subject to parametric variation. This means that some languages prefer to delete [ϕ] features from the internal copy while others prefer to delete [ϕ] features from the external copy. Parametric variation in the preferences exhibited during Reflex Refine (henceforth, Refine Preferences) is (part of) what I refer to as NI Transitivity Alternations.[38]

3. Refine Preferences: a parameter or a general tendency?

The fact that incorporating languages can generally be divided in a binary fashion according to whether or not they permit object agreement in NI contexts suggests that there is a parameter at play. And if the PFDM is correct in assuming that the

38 Recall that NI Transitivity Alternations are defined in (4) above as inter-linguistic *and* intra-linguistic agreement alternations in NI contexts.

grammaticality of object agreement in NI contexts is determined by a language's Refine Preference, then we may have reason to believe that the grammar contains some sort of binary "Refine Preference Parameter" that could be defined something like:

(30) The Refine Preference Parameter: {Delete, Do not delete} [ϕ] features from the internal copy of the object.

Something that may challenge this interpretation, however, is that NI-related agreement behaviours exhibited by incorporating languages are not always consistent within languages. As the cumulative nature of Mithun's (1984) classification implies, the boundaries between Types III and IV languages are fairly fluid, describing general tendencies rather than fixed divisions between incorporating language types. This means that languages that generally exhibit Type III-associated agreement behaviour may occasionally permit agreement in NI contexts, and vice versa.

Take Inuktitut for example. It has been widely assumed that dialects of Inuktitut always display intransitive agreement in NI contexts. Sadock states that , in Kalaallisut (Greenlandic), a language closely related to Inuktitut, "a verb will never agree with the incorporated object" (1980:307). The South/North Baffin data in (31) below appears to support Sadock's interpretation. Note that the incorporating verb bears the intransitive agreement morpheme *-tunga* (in bold):

(31) South and North Baffin Inuktitut (Johns 2009:187)

Savi-siuq-**tunga**.
knife-look.for-PART.**1sS**
"I am looking for the knife."

Based on the fact that there is so much evidence for this agreement pattern in the literature on Inuktitut dialects, it would seem plausible to assume that the Refine Preference for dialects of Inuktitut is to delete [ϕ] features from the internal copy of the object, thus blocking object agreement. But as the following three examples from Johns (2009:193) show, transitive agreement in NI contexts is optional in distinct dialects of Inuktitut:

(32) Qamani'tuaq (Johns 2009:193)

Carmen atigi-liu-**gait** Saali iti-rami taku-vait.
Carmen shirt-make-PART**.3s|3p** Sally come.in-when.3s see-INDIC.3s|3p
"Carmen made some shirts. When Sally came, she saw them."

(33) South Baffin

Iqaluk-tuq-**para**!
fish-consume-INDIC.**1s|3s**
"I'm eating the fish!"

(34) North Baffin

uqalimaaga-siuq-**tara** pi-taqa-nngit-tuq.
book-look.for-PART.**1s|3s** EXP-exist-NEG-INTR.PART.3s
"The book I am looking for isn't there."

In PFDM terms, the data in (32), (33) and (34) should be classified as Type IV because it is obtained by the Type IV-associated Refine Preference to delete [ϕ] features from the

external copy of the object. Like Johns (2009), I cannot explain why there is transitive agreement in this set of cases. Crucially for our current discussion, examples (31), (33) and (34) show that both transitive and intransitive agreement can occur in NI contexts *within the same language*. In order for the PFDM to reflect the fact that NI Transitivity Alternations can occur intra-linguistically in languages such as South Baffin and North Baffin, we must assume that Refine Preferences are more flexible in some languages than others.

For my purposes, it is not necessary to worry too much about whether or not the Refine Preference is a parameter. We can classify incorporating languages by the Refine Preference they tend to exhibit the most by using the classification system that was begun by Mithun (1984) and carried on by Rosen (1989) and Baker et al. Thus languages whose general preference is to delete [ϕ] features from the internal copy of the object can be referred to as Type III languages, and languages whose general preference is to generally delete [ϕ] features from the external copy of the object can be referred to as Type IV languages.

4. Applying the PFDM to Generic NI language data

We will now put the PFDM into action by using it to classify agreement alternations in incorporating language data. Let us begin by walking through the example sentences from Ponapean shown in (35) below. Here we have a typical minimal pair, with the non-incorporating sentence in (35a) and the incorporating sentence in (35b):

(35) Ponapean (Rehg 1981:209–10)

a. I pahn ihkos-**e** likou ehu.
I will pleat-**TR** dress a
"I will pleat a dress."

b. I pahn ihkos-**Ø**-likou.
I will pleat-**INTR**-dress
"I will dress-pleat."

The incorporating constructions in (35b) is obtained in PFDM terms in the following way. First, *v* is generated containing a [u-ROOT] feature and a set of [u-ϕ] features. *v* provokes an external copy of its DO, *likou* "dress", and consequently forms a chain with the two copy's of the object due to their identical [ROOT] features. This gives Reflex Refine a reason to step in. While Reflex Refine is at work on the identical [ROOT] features, it takes the time to do a general clean up, in the course of which it wipes out one set of [ϕ] features from one copy of the object, like a florist who only likes one of each kind of flower in each arrangement. Ponapean's Refine Preference is to delete [ϕ] features from the internal copy of the object, which deactivates the [ϕ] features attached to the internal copy within the tree. Thus when *v* searches for a goal to value its [u-ϕ], it does not find the deactivated [ϕ] features in the internal copy and therefore must display intransitive agreement.

The same interpretation applies to all Type III languages, another example of which is Chukchi, an ergative language from the Chukotko-Kamchatkan language group (Spencer 1995:440). In the Chukchi example below, assume that the NI construction in (36b) derives from (36a), the only difference being that the *v* in (36b) contains a [u-ROOT]

feature. Further assume that provocation precedes agreement because *v*'s [u-ROOT] feature is generated at the same time as its [u-ϕ] features.[39]

(36) Chukchi (Spencer 1995:444)

a. ənan qaa-t qərir-**ninet**
he.ERG deer-ABS.p seek-**3s|3p**
"He looked for the reindeer."

b. ətlon qaa-rer-**gʔe**
he.ABS deer=seek-**3sS**
"He looked for the reindeer."

Provocation results in a chain relationship between *v* and the two copies of the object because of their matching P-features. In keeping with Chukchi's Refine Preference, Reflex Refine deletes [ϕ] features from the internal copy of the object, making object agreement impossible.

Now let us walk through the steps involved in creating a Type IV language using an example from Southern Tiwa for illustration.

39 In PFDM terms, the presence of transitive agreement morphology in the non-incorporating construction in (36a) results from there being no opportunity to delete [ϕ] features from the internal copy of the object due to the absence of provocation (i.e., the absence of a [u-ROOT] feature in *v*).

(37) Southern Tiwa (Allen, Gardiner & Frantz 1984)

a. Seuan-ide **ti**-mũ-ban.
man-S **1s|A**-man-see-PAST
"I saw the/a man."

b. **Ti**-seuan-mũ-ban.
1s|A-man-see-PAST
"I saw the/a man."

The Southern Tiwa incorporating example in (37b) is derived from (37a) via the same operations described for Ponapean and Chukchi, the only difference being its Refine Preference. Instead of deleting [ϕ] features from the internal copy, Southern Tiwa deletes these features from the external copy. Later, when *v* searches its complement for a goal that can value its [u-ϕ] features, it finds [ϕ] features in the internal copy that were unaffected by Reflex Refine and agrees with them. Consequently, Southern Tiwa (and other languages that share its Refine Preference) display transitive agreement.

5. Conclusion

The goals of this chapter were to see how well the PFDM can predict the existence of NI Transitivity Alternations in real language data (Generic NI contexts for now) and to understand how strict Refine Preferences are within a given language. We have seen that the PFDM gets the job done: different Refine Preferences describe the agreement alternations observed in each of the Generic NI examples we looked at. These Refine

Preferences correspond to Mithun's (1984) Types III and IV. Thus we can henceforth use Mithun's typology to refer to different Refine Preference tendencies.

The Inuktitut data revealed that there can be variation in the Refine Preferences exhibited by a single language. Thus the terms Type III and Type IV should be used not only to refer to alternations in the Refine Preferences that occur between languages, but also those that occur within languages. We can conclude that Refine Preferences describe general tendencies rather than strict rules.

That is as far as we are going to explore Generic NI contexts for now. The reader should now firmly grasp the reason for assuming that NI is a type of movement operation that precedes agreement. The reader should also understand how the PFDM interprets NI Transitivity Alternations in Types III and IV languages in Generic NI contexts. Now that the foundation of the PFDM has been laid, we can start to address more complex forms of NI.

Chapter 5: Partial NI, Double Object NI, and chain formation identity

1. Introduction

In this chapter, the PFDM is applied to two NI contexts that are more complex than Generic NI: Partial NI and Double Object NI. Partial NI refers to NI constructions that contain both an IN and a non-identical unincorporated object. Double Object NI refers to constructions that contain an IN and an identical unincorporated object.

These new NI contexts force us to reconsider the previously held assumption that the two copies of the object must be semantically and phonetically identical in order for them to form a chain. I adopt Branigan's (2011) interpretation of Partial NI and build further on his interpretation to account for Double Object NI. The crucial concept for both interpretations is that different NI contexts have different restrictions on phonetic and/or semantic identity in chain formation. As such, it provides the basis for a new abstract typology of NI contexts. Further, this new interpretation of chain formation forces us to nuance our current definition of Reflex Refine's feature deletion capabilities.

2. Partial NI

Let us begin by familiarizing ourselves with Partial NI by looking at some data. Once we are more familiar with this particular type of NI behaviour, we can see how well a PFDM interpretation applies to the data and adjust the model accordingly.

Partial NI refers to NI contexts where the IN is accompanied by a phonetically non-identical, unincorporated object. In (38) below, there are two examples of Partial NI

from Caddo, a language predominantly spoken in southwestern and south-central Oklahoma (Melnar 2004:2). Both incorporating constructions contain the IN, *(ʔi)čʔah* "eye", as well as an unincorporated object in DO position: *kassiʔ* "bead" in example (38a) and *č'ahkaʔayʔ* "bone nettle" in example (38b):

(38) Partial NI in Caddo

a. (Melnar 2004:174; Chafe b543)[40]

ʔičʔah-na-ka-ʔniʔ-čah kassiʔ [41]
eye-DIST-buy-INTENT bead
"he's going to buy beads"

b. (Melnar 2004:137; from Chafe 1977:32)

C'ahkaʔayʔ yi-(ʔi)č'ah-na-ni-wáhd-ah
bone.nettle DEFOC.AGT-eye-DIST-PORT-come-PERF
"They brought bone nettles [...]"

When incorporated, the noun root *(ʔi)čʔah* "eye" can refer to any small round object (Melnar 2004:175). Since the unincorporated objects in both examples share these qualities with the INs, there appears a semantic relationship exists between the unincorporated objects and their corresponding INs. But clearly neither of the non-incorporated objects share the same phonetic forms as their INs.[42]

40 The data in (38a) comes from Melnar (2004), who in turn retrieved it from Chafe's unpublished field notes. Melnar identifies the precise source with a letter-number sequence, which I include.

41 There are two different registers in Caddo: fast and slow (Melnar 2004:4). Although the slow register is spoken less by younger generations of speakers, it provides a clearer parse of the verbal morphology we are interested in observing. Hence, all examples from Caddo will be written in the slow register.

42 We will address the issue of semantic identity further on in this section.

How can such data be interpreted in PFDM terms? In Chapter 3 Section 2.2, I argued that when NI occurs, the internal copy of the object remains in situ but has its phonetic content deleted during Reflex Refine. This claim was based on the assumption that the two copies of the object have identical phonetic forms. But if we are to interpret the IN and unincorporated object in each of the Caddo examples above as copies of the same object, then phonetic identity in chain formation must be more flexible in certain cases than previously assumed.

This is exactly the argument that Branigan (2011) makes in his PS interpretation of Partial NI. Branigan argues that some languages are more lenient about the types of constituents that can form a chain: in some languages chains can be formed from constituents that have only *partially* matching features (p. 38). More specifically, Branigan argues that, in some incorporating languages, the verb is able to provoke an external object (i.e., copy) that matches the DO's semantic features only. Caddo is an example of such a language.[43]

Let us apply this interpretation to the example in (38b). First, the verb provokes a copy of its DO, *č'ahkaʔay*. The external copy that is provoked, *ičʔahi*, has the same semantic features as the internal copy, which in Caddo is enough for them to form a chain, as is shown below:

43 Susana Béjar (p.c.) suggests that the IN may be a classifier in such contexts rather than a non-identical copy of the DO, a direction of thought I will not pursue at this point.

(39) (ni-wáhd , ičʔah , č'ahkaʔayʔ)
[semantic content *x*] [semantic content *x*]

Since Refine operations cannot delete non-identical content from chains, the phonetic content of both copies of the goal is retained.[44]

Branigan's (2011) interpretation of Partial NI requires no alterations to fit into the PFDM.[45] The same interpretation can be applied to the following NI data from Rembarnga.

(40) Partial NI in Rembarnga (McKay 1975:296)

kamunuŋkuʔ-Ø ka-yi-ŋuwaʔ-maɲ.
white.ochre-NOM 3sS-COMIT-white.ochre-went
"some white ochre arrived (i.e., brought by someone)."[46]

The construction in (40) begins when *v* (which contains a [u-ROOT] feature and a set of uninterpretable [ϕ] features) merges with its DO *kamunuŋkuʔ* "white ochre". In order to value its [u-ROOT] feature, *v* provokes an external copy of its DO. In this context, it is acceptable for a phonetically non-identical/semantically identical external copy of the

44 Branigan says this in reference to partial wh-movement contexts, however he makes it clear that the same principles apply to Partial NI contexts as well (2011:19).

45 The only difference between Branigan's (2011) interpretation of Partial NI and my own is that Branigan assumes that a Refine operation occurs immediately before Transfer, whereas I assume that a "Reflex Refine" operation occurs immediately after provocation.

46 The Rembarnga data in (40) is an example of NI into an unaccusative verb, which means that the subject originated in DO position. In most syntactic interpretations of NI, incorporation into unaccusatives is considered to be simply another form of object incorporation. This interpretation makes Partial NI in unaccusative constructions relevant to the discussion at hand. My interest is limited to the level of *v*P because that is the level at which object NI occurs. I will not explore how objects end up in subject position in unaccusative constructions.

object to form a chain with the internal copy of the object. Thus the external copy that is provoked by the verb has the form *ŋuwaʔ* "white ochre".

It is important to note at this point that when I talk about phonetic and semantic "content" I am referring to formal features, in keeping with the Chomskyan preference to assume, as much as possible, that phonetic and semantic content can be quantified in the same manner (only we do not get to look at the semantic side as easily) (Chomsky 1995:230). Formal semantic features include [ϕ] features and exclude lexical content. Hence, saying that two copies of an object have semantic identity implies that they have matching [ϕ] features.

Up to this point, we have assumed that the internal and external copies of an object have identical [ϕ] features in both Generic NI contexts (i.e., all data shown between (1) to (37)) and Partial NI contexts (i.e., examples (38a), (38b) and (40)). And since deletion preferences exhibited during Refine are assumed to apply in chains that contain matching [ϕ] feature sets, we can assume that the same Refine Preferences are exhibited in Generic NI and Partial NI contexts. In other words, NI Transitivity Alternations in Partial NI contexts are obtained in the exact same way as in Generic NI contexts. The same interpretation should be true of any and all NI contexts in which the two copies of the object have semantic identity.

Let us apply this interpretation to the Rembarnga data in (40). It is assumed that the internal copy of the object *ŋuwaʔ* and the external copy of the object *kamunuŋkuʔ* share identical semantic content, i.e., the two copies of the object have matching sets of

[ϕ] features. Intransitive agreement morphology (*-yi-*) on the verb indicates that Rembarnga's Refine Preference is to delete [ϕ] features from the internal copy of the object. Deletion of the internal copy's [ϕ] features in the chain deactivates the corresponding [ϕ] features in the tree, making object agreement impossible.

Like Rembarnga, Caddo's Refine Preference in Partial NI contexts is to delete [ϕ] features from the internal copy of the object, though it takes a little more effort to see. In example (38a), there is no morphological indication that object agreement occurs. But the construction in (38b) contains verbal morphology that indicates grammatical transitivity, which masks the fact that it is syntactically intransitive. Example (38b) is repeated below in (41):

(41) Partial NI in Caddo (Melnar 2004:137; from Chafe 1977:32)

č'ahkaʔayʔ yi-(ʔi)č'ah-na-ni-wáhd-ah
bone.nettle DEFOC.AGT-eye-DIST-PORT-come-PERF
"They brought bone nettles."

This sentence is grammatically transitive because the portative morpheme *-ni-* adds a grammatical patient which references the carried entity, i.e., the DO "bone nettles" (Melnar 2004:137). Further, the distributive morpheme -na- implies that the grammatical patient is plural (p. 116). This is because the distributive morpheme expresses the distribution of not only the event being described by the verb, but also the distribution of the argument that is most closely associated with the verb, i.e., the absolutive argument (which is again the DO "bone nettles").

But despite being grammatically transitive, this sentence is syntactically intransitive. We know this because the distributive morpheme is always associated with the absolutive argument, which can be either the subject of an intransitive clause (both unaccusative or unergrative) or the object of a transitive clause (p. 118). Because the distributive morpheme can be associated with both unergative subjects and objects, it cannot be interpreted as object agreement morphology. We must therefore conclude that Caddo generally displays intransitive agreement in Partial NI contexts, which in PFDM terms means that Caddo's Refine Preference is to delete [ϕ] features from the internal copy of the object.

Let us summarize what we have just added to the pot. The PFDM adopts Branigan's (2011) interpretation of Partial NI as contexts in which phonetically non-identical copies of an object can form chains. This interpretation of chain formation has no bearing on the deletion of [ϕ] features during Reflex Refine because it is still assumed that the two copies of the object have semantic identity. Consequently, NI Transitivity Alternations in Partial NI and Generic NI contexts are obtained in exactly the same way.

Of course, it would be too easy if that was all there was to it. Our current interpretation of Partial NI only describes contexts where there is semantic identity in chain formation, such as is found in Caddo and Rembarnga. But not all languages require semantic identity between the two copies of the object in order for Partial NI to occur. For example, take Gunwinggu, an Australian Aboriginal language that exhibits Partial NI. In this language, it is possible for an IN and an unincorporated object with phonetic non-

identity and only partial semantic-identity to co-occur. An example of Partial NI in Gunwinggu is provided in example (42) below:

(42) Partial NI in Gunwinggu (Mithun 1984:867; from Oates 1964)

...bene-dulg-naŋ man-garalaljmayn.
...3duS-tree-saw III-cashew.nut
"They saw a cashew nut tree."

The phonetic non-identity of the external and internal objects in this sentence is evident: the IN has the form *dulg* "tree", whereas the unincorporated object has the form *garalaljmayn* "cashew nut". In addition to having phonetic non-identity, the forms *dulg* and *garalaljmayn* have only partially matching [ϕ] feature values, as shown below:

(43)

dulg	**garalaljmayn**
3 – person	3 – person
s – number	s – number
IV – gender (i.e., neuter)	III – gender (i.e., vegetable)

The [ϕ] feature breakdown in (43) shows that, though *dulg* and *garalaljmayn* are both third person singular nominals, they do not belong to the same gender class: *dulg* has neuter gender (Class IV) and *garalaljmayn* has vegetable gender (Class III) (Evans 2003:177). This means that the two copies of the object only have partial semantic identity.

I argue that the PFDM can account for semantic non-identity in Partial NI contexts by simply extending the argument that there can be fewer restrictions on

phonetic identity in chain formation to semantic identity. In other words, I argue that some languages are less rigid than others about the level of phonetic *and* semantic identity that is required in chain formation.

Semantic identity in chain formation thus appears to be the key distinction between two types of Partial NI contexts: those which permit phonetic non-identity in chain formation (found in languages like Caddo and Rembarnga), and those which permit both phonetic non-identity and semantic non-identity in chain formation (found in languages like Gunwinggu).[47] I will henceforth refer to these two types as Type A Partial NI and Type B Partial NI. The chain formation restrictions for these two types are summarized in (44):

(44) **Type A Partial NI** = phonetic non-identity, semantic identity
Type B Partial NI = phonetic non-identity, semantic non-identity

Interpreting semantic identity in chain formation as variable not only allows us to distinguish between two types of Partial NI, but also gives us a new way to understand Double Object NI. In Section 3 below, we will explore how this interpretation applies to this new NI context in detail.

47 The two copies of the object need to have at least some matching semantic features in order for them to have a reason to form a chain. Hence, when I use the term "semantic non-identity", the reader should assume that this only refers to a partial semantic mismatch.

3. Double Object NI

Double Object NI (i.e., "doubling") refers to NI contexts in which the IN is accompanied by a phonetically identical, unincorporated object.[48] In (45) below, we see an example of Double Object NI occurring with an unaccusative verb in Rembarnga. In this example, the IN and unincorporated object share the phonetic form *kaṭaˀ* (in bold):

(45) Double Object NI in Rembarnga (McKay 1975:296)

kaṭaˀ-Ø par-**kaṭaˀ**-ta-ŋiŋ.
paperbark-NOM[49] 3p|3s-**paperbark**-stand-(CAUS)-PAST.CONT
"They would spread paperbark (on the ground)."

Let us try to interpret this data in the PFDM terms that we have developed so far. First, the provocative verb *ta* merges with the DO *kaṭaˀ*. In order to value its uninterpretable [u-ROOT] feature, the verb provokes a phonetically identical copy of its [ROOT]-bearing DO, which creates a chain relationship between the verb and the two copies of the object. Following provocation, a Reflex Refine operation wipes out repeated content from the chain, such as [ROOT] features and [ϕ] features. But what happens to the matching phonetic content of the two copies of the object?

The PFDM currently predicts that Reflex Refine should delete the matching phonetic content from one the two copies. And since this is an NI construction, we should

48 Double Object NI is interpreted by some (Mithun 1984; Rosen 1989; among others) as a type of Partial NI.

49 The unincorporated copy of the object is marked with nominative Case, indicating that the object was raised to subject position and agreed with as such. However, the presence of transitive agreement morphology on the verb also indicates that the unincorporated object was agreed with as an object before it was raised to subject position.

expect it to prefer to delete the phonetic content from the internal copy of the object so that only the IN remains visible at PF, just like in Generic NI contexts. But this is not what we find in Double Object NI contexts like (45): instead, both copies of the object retain their identical phonetic content. Clearly, we need to develop the PFDM to be able to account for such data.

Let us hold onto the assumption that Reflex Refine must delete identical content from chains in order to retain a more restrictive model. If this assumption holds, then the identical phonetic content of both copies must be forced to stick around for some other reason. I propose the following solution: matching phonetic content cannot be deleted from a chain if the corresponding semantic content is non-identical. What I am proposing implies that semantic content plays a role in determining phonetic content, but not vice versa.

It is difficult to determine semantic identity in Double Object NI contexts because semantic identity can only be observed through the phonetic content of the two copies of the object, which in these contexts take the same form. Recall that in the Gunwinggu Type B Partial NI data in (42), the semantic mismatch could be observed in the phonetic form of the two copies. Now compare this to the Rembarnga Double Object NI example in (45), in which the IN and the unincorporated object share the phonetic form *kaṭaˀ* . In the latter case, it is impossible to tell from the data alone whether or not the semantic features of the two copies are identical.

Despite this drawback, there is good reason to assume that there is semantic non-identity in chain formation in Double Object NI contexts. To begin with, it is already an accepted fact that semantic features play a role in determining phonetic content. Take plurality in English for example. When the nominal man contains plural number as part of its set of [ϕ] features, it gets spelled-out with the suppletive plural form men. In other words, the phonetic content of the nominal is directly influenced by its semantic content, in this case visibly so. The only difference between this concept and my proposed interpretation of Double Object NI is that, in the latter context, semantic content does not have a visible influence on the phonetic content. Instead, I argue that its influence is only observable at a discourse level.

My proposed interpretation of Double Object NI shares a connection with Hale & Keyser's (2002) interpretation of cognate and hyponymous objects. Cognate and hyponymous objects are objects that can be added to an otherwise intransitive verb for the purpose of creating a more complex form of discourse-level semantics. In (46) below, I have made up some examples of cognate and hyponymous objects using the unergative English verb *scream* to aid my explanation. This verb is normally intransitive, as is shown in (46a). But for many English speakers, it is also grammatical (though perhaps still a bit unusual) for it to take either a cognate object (shown in (46b)) or a hyponymous object (shown in (46c)) as its complement. The sentence in example (46d), on the other hand, is ungrammatical for English speakers.

(46) Cognate and hyponymous objects

a. She screamed.
b. She screamed a scream.
c. She screamed an aria.
d. *She screamed an area.

Hale & Keyser (2002:71) argue that a normally intransitive verb like *scream* can only take an object as its complement if the verb and object share at least some of the same semantic content. The cognate object and the verb in example (46b) are assumed to have identical root material. Further, the hyponymous object in (46c) is assumed to have root material that partially matches that of the verb. But the object *area* in example (46d) does not share any of the same root material with the verb. Adding cognate or hyponymous objects to an otherwise intransitive verb is an acceptable way of adding a subtle layer of meaning to the discourse because these kinds of objects are semantically related to the verb. But adding a semantically non-related object to the verb just makes the construction nonsensical.

I argue that Double Object NI is grammatical in some incorporating languages for the same reason that cognate objects are grammatical in English (with one important tweak to Hale & Keyser's (2002) definition of cognate objects). The cognate object in (46b) has the exact same phonetic content as the verb, but instead of making the derivation crash, it adds extra meaning, perhaps a hint of humour, to the sentence. Similarly, two phonetically identical objects in Double Object NI contexts, as is found in example (45) above, are permissible if the presence of both objects nuances the meaning

of the whole sentence. In both contexts, the doubled form is only grammatical if it lends an extra layer of meaning to the construction.

I argue that the extra layer of meaning provide by a cognate object, or the unincorporated object in a Double Object NI construction, can be characterized as semantic non-identity between the two copies of the object. However we choose to characterize this lack of identity (for instance, as an extra feature in one copy, or a feature with different values in each copy) the result is the same: the two phonetically identical copies of the object cannot be deleted from the chain during Reflex Refine. I conclude that Double Object NI can be interpreted as a context that permits phonetic identity and semantic non-identity in chain formation. The relevant chain formation restrictions are summarized in (47) below:

(47) **Double Object NI chain restrictions** = phonetic identity, semantic non-identity

The above interpretations of Partial NI and Double Object NI have made it possible to obtain NI Transitivity Alternations the same way in each contexts. But this is not the only benefit of this interpretation.

4. A new typology of incorporating languages

I have made a number of separate claims about how identity in chain formation plays a role in the creation of different NI contexts. Drawn together, they reveal a new typology of NI contexts.

Let us begin by summarizing the claims I have made about identity in chain formation. In Section 2, I proposed that semantic identity restrictions in chain formation are what distinguish two types of Partial NI: Type A are contexts with semantic identity, and Type B are contexts with semantic non-identity. Semantic identity is also the key difference between Generic NI and Double Object NI, again with the former context characterized by semantic identity in chain formation, and the latter by semantic non-identity. I further proposed that phonetic identity occurs in Generic NI contexts and Double Object NI, and that phonetic non-identity occurs with both types of Partial NI.

Joined together, these claims indicate that identity in chain formation is the key difference between four types of NI: Generic NI, Type A Partial NI, Type B Partial NI and Double Object NI. Semantic and phonetic identity restrictions on chains that a language exhibits in NI contexts is the only element that varies between these four contexts. Put more strongly, restrictions on identity in chain formation are responsible for creating different types of NI contexts. This new typology of NI contexts is summarized in Table 2 below:

Table 2: New typology of NI contexts based on identity in chain formation

Phonetic/semantic identity	**Resulting NI context**	**Sample languages**
Phonetic identity, Semantic identity	Generic NI	Mapudungun, S. Tiwa
Phonetic non-identity, Semantic identity	Class A Partial NI	Caddo, Rembarnga
Phonetic non-identity, Semantic non-identity	Class B Partial NI	Gunwinggu
Phonetic identity, Semantic non-identity	Double Object NI	Rembarnga

This new classification differs from Mithun's (1984) typology in one important way: it distinguishes between NI contexts rather than NI languages. Both models assume that different NI contexts and agreement alternations can occur within the same language. But Mithun interprets this as a sign that incorporating languages have cumulative stages of evolution. The typology I am proposing does not share this lexicalist interpretation. Instead, it shows the relationship between different NI contexts without making assumptions about what stage of "evolution" the languages that contain these constructions are in.

5. NI Transitivity Alternations in NI contexts with semantic non-identity

In Section 2 of this chapter, I argued that Type A Partial NI only allows semantically identical copies of the object to form chains, just like in Generic NI contexts. And since two copies with semantic identity must have matching [ϕ] features, I concluded that Reflex Refine deletes [ϕ] features from one copy of the object, in keeping with the Refine

Preference of the language in question. We can conclude from this that NI Transitivity Alternations are obtained the same way in all languages that require semantic identity in chain formation. But how are NI Transitivity Alternations obtained in contexts where there is semantic non-identity, specifically when the two copies have non-identical [ϕ] features?[50]

Up until this point, I have assumed that [ϕ] features are deleted from chains in sets. This interpretation is adequate for describing Generic NI and Type A Partial NI contexts because the [ϕ] feature sets in the two copies of the object are identical. But when [ϕ] feature sets are non-identical, as in Double Object NI and Type B Partial NI contexts, it becomes impossible to obtain NI Transitivity Alternations if we assume that [ϕ] feature deletion applies to these sets as wholes. I will explain this in more detail.

If Reflex Refine deletes [ϕ] feature sets as wholes, then a single mismatched [ϕ] feature between the two sets is enough to bar deletion of either set. And if neither set of features can be deleted, there should always be a set left in the internal copy of the object that is available for object agreement. This interpretation of Reflex Refine predicts that incorporating verbs should always bear transitive agreement morphology in contexts with semantic non-identity, a prediction that the Gunwinggu Type B Partial NI data in (42) (repeated in (48) below) proves wrong:

50 I will henceforth use the term "semantic non-identity" only to refer to copies of semantic content that contain non-identical [ϕ] features in order to maintain an easy comparison between semantic and phonetic content.

(48) Partial NI in Gunwinggu (Mithun 1984:867; from Oates 1964)

...bene-dulg-naŋ man-garalaljmayn.
...3duS-tree-saw III-cashew.nut
"They saw a cashew nut tree."

It was previously shown that, in this example, the two copies of the object have semantic non-identity because they do not share the same gender feature value. Further, we can see that the sentence is intransitive because there is only agreement with the third person dual subject. Put together, these two facts indicate that intransitive agreement can occur in contexts with semantic non-identity. This data forces us to conclude that Reflex Refine must not delete [ϕ] feature sets as wholes.

This issue is easily resolved if we assume that Reflex Refine deletes [ϕ] features individually. In semantic non-identity contexts that display intransitive agreement, individual matching [ϕ] features are deleted from the internal copy of the object in keeping with the Type III Refine Preference. Any non-matching [ϕ] features remain attached to both copies. Applied to the Gunwinggu example in (48), this means that the matching person and number features are deleted from the internal copy, but the mismatched gender features remain in both copies. Following Reflex Refine, *v* attempts to agree with its object. But *v* cannot agree with a single [ϕ] feature left in the internal copy of the object: a full set of [ϕ] features is required for object agreement to take place. Thus the verb bears intransitive agreement morphology.

In semantic non-identity contexts that display transitive agreement, individual [ϕ] features are deleted from the external copy of the object instead (i.e., the Type IV Refine

Preference). Consequently, a full set of [ϕ] features remains in the internal copy of the object, completely unaffected by the presence of mismatched [ϕ] features which could not be deleted from the external copy. Let us apply this interpretation to the Rembarnga Double Object NI example in (45) (repeated in (49) below):

(49) Double Object NI in Rembarnga (McKay 1975:296)

kaṭaʔ-Ø **par**-kaṭaʔ-ta-ŋiŋ.
paperbark-NOM[51] **3p|3s**-paperbark-stand-(CAUS)-PAST.CONT
"They would spread paperbark (on the ground)."

In this example, the two copies of the object that form a chain share most of the same semantic features, but I argue that there is at least one [ϕ] feature that is mismatched. This feature is responsible for creating the phrase-level stylistic semantics that were discussed in Section 3 above. Reflex Refine deletes identical [ϕ] features from the external copy, in keeping with the Type IV Refine Preference. Non-identical semantic features cannot be deleted, and therefore remain in both copies. Crucially, none of the [ϕ] features belonging to the internal copy are deleted. Thus, following Reflex Refine, v agrees with the internal copy, causing it to bear transitive agreement morphology.

I argue that we should extend this new interpretation of Reflex Refine to NI contexts with semantic identity as well to keep the model as restrictive as possible. Thus [ϕ] features are now assumed to be deleted individually in all NI contexts, whether or not

51 The unincorporated copy of the object is marked with nominative Case, indicating that the object was raised to subject position and agreed with as such. But the presence of transitive agreement morphology in the verb complex also indicates that the unincorporated object was agreed with as an object before it was raised to subject position. So it is still a valid example of Double Object NI.

this results in the deletion of one copy's entire set of [ϕ] features. This interpretation makes it possible for the PFDM to obtain NI Transitivity Alternations in exactly same way in each of the NI contexts that we have discussed, and likely others as well.

6. Conclusion

In this chapter, I applied the PFDM to Partial NI and Double Object NI, two contexts that require a little more theoretical work than the Generic NI examples seen in Chapter 4. Following Branigan (2011), I interpreted Partial NI as contexts in which there are fewer restrictions on the level of phonetic identity that is required for two copies of an object to form a chain. In other words, Partial NI is characterized by phonetic non-identity in chain formation. I then extended Branigan's interpretation of phonetic identity to semantic identity in order to distinguish between two types of Partial NI: Type A, in which semantic identity in chain formation is required, and Type B, in which semantic identity in chain formation is not required. I further extended this interpretation to Double Object NI in order to explain why both copies of the object get spelled-out despite being phonetically identical. Based on the assumption that semantic content influences phonetic content, I argued that identical phonetic content cannot be deleted from the chain in these contexts because the corresponding semantic content is non-identical.

We have gained insight from the idea that identity in chain formation is variable. Crucially, we found that identity in chain formation may be interpreted as the main distinguishing feature of the four types of NI observed. This discovery led me to suggest a

new typology of NI contexts that defines each NI context according to identity restrictions in chain formation.

The idea that identity in chain formation is variable also forced us to reconsider how Reflex Refine performs its deletion duties. It was shown that the PFDM only predicts the existence of NI Transitivity Alternations in all four of the NI contexts observed if Reflex Refine deletes [ϕ] features individually.

A general description of the PFDM is now complete. We have found ways to account for all of the NI data that have been used as examples throughout this thesis. The reader should now understand how NI Transitivity Alternations are obtained in PFDM terms in four different NI contexts, as well as the relationship between these four contexts.

Chapter 6: Conclusion

Way back in Chapter 1, I asked, "what causes NI Transitivity Alternations?", and the journey began. The first step was to explore the existing literature to see if an answer had already been reached by one of the three models of NI Transitivity Alternations that already exist. But we found that, though each model offered crucial insight into the issue, the question still dangled like a carrot before us. And so we left the beaten path, with the warm orange glow of a carrot to light the way.

I argued that we could build on the strengths of the existing models (in particular, the FDP) while eliminating their foundational issues by placing them in a PS framework. After justifying the chosen theoretical approach and carefully defining terms, we applied the PFDM to real language data. When all was said and done, we were able to conclude that the same mechanism (i.e., Refine Preferences) is responsible for the creation of NI Transitivity Alternations in each of the NI contexts observed (i.e., Generic NI, Partial NI and Double Object NI).

We are also left with a prediction to pursue in future research, which is that NI Transitivity Alternations are obtained via the same mechanism in all NI contexts. The PFDM would be most economical if this prediction should prove to be true. But even without considering its future potential, the new model is preferable to all models that precede it because it is grounded in a solid theoretical framework, is consistent in its definition of terms, and obtains grammatical results in both single and double object NI contexts.

Something else that we wanted to keep an eye out for as we started applying the PFDM to language data was what the model might reveal about the relationships between different types of NI. I adopted Branigan's (2011) interpretation of Partial NI and built further on it to provide an interpretation of Double Object NI. In this interpretation, the crucial difference between the four NI contexts we looked at is the level of restriction on phonetic and semantic identity permitted in chain formation. This argument was made to allow for a unified theory of NI Transitivity Alternations across contexts. But it also became the basis of a new abstract typology that distinguishes between NI contexts rather than incorporating language types. Generic NI, Partial NI (Types A and B), and Double Object NI are now assumed to be fundamentally identical in all ways but one: identity in chain formation. And if, as this assumption implies, NI Transitivity Alternations result from a mechanism that is identical across contexts, then these alternations should be a consistent, predictable and easily measurable phenomena relating to NI.

There are a number of NI-related phenomena that we have not had the space to consider, such as referentiality, animacy, modifier stranding, and antipassivization, to name only a few. It seems likely that the model will require revision as more NI-related phenomena are addressed. But what we have so far gives us a solid foundation to work with in the future, and an effective interpretation of NI Transitivity Alternations to make use of in the meantime.

Bibliography

Allen, Barbara J., Donna B. Gardiner & Donald G. Frantz. 1984. Noun incorporation in Southern Tiwa. *International Journal of American Linguistics* 50(3). 292–311.

Baker, Mark C. 1988. *Incorporation: A theory of grammatical function changing*. Chicago: University of Chicago Press.

—— 1996. *The polysynthesis parameter*. New York: Oxford University Press.

——, Roberto Aranovich & Lucía A. Golluscio. 2005. Two types of syntactic noun incorporation: Noun incorporation in Mapudungun and its typological implications. *Language* 81(1). 138–76.

Boeckx, Cédric. 2000. Quirky agreement. *Studia Linguistica* 54(3). 354–380.

Borer, Hagit. 2005a. *In name only*. *Structuring sense,* Vol 1. Oxford: Oxford University Press.

—— 2005b. *The normal course of events*. *Structuring sense,* Vol 2. Oxford: Oxford University Press.

Branigan, Phil. 2011. *Provocative syntax*. Cambridge: MIT Press.

Burzio, Luigi. 1986. *Italian syntax: A government-binding approach*. Dordrecht: Reidel.

Chafe, Wallace L. 1977. Caddo Texts. *International Journal of American Linguistics* 2(1). 27–43.

Chomsky, Noam. 1975. *The logical structure of linguistic theory*. New York: Plenum Press.

—— 1981. *Lectures on government and binding*. Dordrecht: Foris.

—— 1995. *The minimalist program*. Cambridge: MIT Press.

—— 2000. Minimalist inquiries: The framework. In Roger Martin, David Michaels & Juan Uriagereka (eds.), *Step by step: Essays on minimalist syntax in honor of Howard Lasnik*, 89–155. Cambridge: MIT Press.

—— 2001. Derivation by phase. In Michael J Kenstowicz (ed.), *Ken Hale: A life in language*, 1–52. Cambridge: MIT Press.

—— 2008. On phases. In Robert Freidin, Carlos P. Otero & Maria L. Zubizarreta (eds.), *Foundational issues in linguistic theory: Essays in honor of Jean-Roger Vergnaud*, 133–66. Cambridge: MIT Press.

Evans, Nicholas. 2003. *Bininj Gun-wok: A pan-dialectal grammar of Mayali, Kunwinjku and Kune*. *Pacific Linguistics* 541. Canberra: Australian National University.

Hale, Kenneth & Samuel J. Keyser. 1993. On argument structure and the lexical expression of syntactic relations. In Kenneth Hale & Samuel J. Keyser (eds.), *The view from Building 20: Essays in linguistics in honor of Sylvain Bromberger*, 53–109. Cambridge: MIT Press.

—— 2002. *Prolegomenon to a theory of argument structure*. Cambridge: MIT Press.

Halle, Morris & Alec Marantz. 1993. Distributed morphology and the pieces of inflection. In Kenneth Hale & Samuel J. Keyser (eds.), *The view from Building 20: Essays in linguistics in honor of Sylvain Bromberger*, 111–76. Cambridge: MIT Press.

Johns, Alana. 2007. Restricting noun incorporation: Root movement. *Natural Language & Linguistic Theory* 25(3). 535–76.
—— 2009. Additional facts about noun incorporation (in Inuktitut). *Lingua* 119(2). 185–98.
Kitagawa, Yoshihisa. 1986. Subjects in Japanese and English. Ph.D. dissertation, Amherst: University of Massachusetts.
Larson, Richard K. 1988. On the double object construction. *Linguistic Inquiry* 19(3). 335–91.
McKay, Graham R. 1975. Rembarnga, a language of Central Arnhem Land. Ph.D. dissertation, Canberra: The Australian National University.
Melnar, Lynette R. 2004. *Caddo verb morphology*. Lincoln: University of Nebraska Press.
Merlan, Francesca. 1976. Noun incorporation and discourse reference in Modern Nahuatl. *International Journal of American Linguistics* 42(3). 177–91.
Mithun, Marianne. 1984. The evolution of noun incorporation. *Language* 60(4). 847–94.
Nunes, Jairo. 2011. The copy theory. In Cedric Boeckx (ed.), *The Oxford handbook of linguistic minimalism*, 143–172. Oxford: Oxford University Press.
Pesetsky, David & Esther Torrego. 2007. The syntax of valuation and the interpretability of features. In Simin Karimi, Vida Samiian & Wendy K. Wilkins (eds.), *Phrasal and clausal architecture: Syntactic derivation and interpretation*, 262–94. Amsterdam: John Benjamins Publishing Company.
Preminger, Omer. 2014. *Agreement and its failures*. Cambridge: MIT Press.
Radford, Andrew. 2004. *Minimalist syntax: Exploring the structure of English*. Cambridge: Cambridge University Press.
Rehg, Kenneth L. 1981. *Ponapean reference grammar*. Honolulu: University Press of Hawaii.
Roberts, Ian G. 2010. *Agreement and head movement: Clitics, incorporation, and defective goals*. Cambridge: MIT Press.
Rosen, Sara T. 1989. Two types of noun incorporation: A lexical analysis. *Language* 65(2). 294–317.
Sadock, Jerrold M. 1980. Noun incorporation in Greenlandic: A case of syntactic word formation. *Language* 56(2). 300–19.
Spencer, Andrew. 1995. Incorporation in Chukchi. *Language* 71(3). 439–89.
Tarpent, Marie-Lucie. 1982. Ergative and accusative: A single representation of grammatical relations with evidence from Nisgha. *Working Papers, Linguistic Circle of Victoria* 2(1). 1–57.