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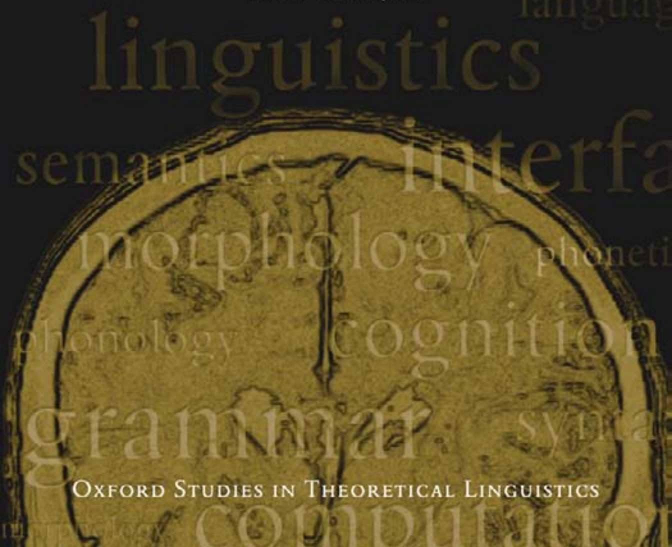
Phi Theory

Phi-Features across Modules and Interfaces

edited by

DANIEL HARBOUR,
DAVID ADGER, AND
SUSANA BÉJAR



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General Preface

The theoretical focus of this series is on the interfaces between subcomponents of the human grammatical system and the closely related area of the interfaces between the different subdisciplines of linguistics. The notion of 'interface' has become central in grammatical theory (for instance, in Chomsky's recent Minimalist Program) and in linguistic practice: work on the interfaces between syntax and semantics, syntax and morphology, phonology and phonetics, etc. has led to a deeper understanding of particular linguistic phenomena and of the architecture of the linguistic component of the mind/brain.

The series covers interfaces between core components of grammar, including syntax/morphology, syntax/semantics, syntax/phonology, syntax/pragmatics, morphology/phonology, phonology/phonetics, phonetics/speech processing, semantics/pragmatics, intonation/discourse structure, as well as issues in the way that the systems of grammar involving these interface areas are acquired and deployed in use (including language acquisition, language dysfunction, and language processing). It demonstrates, we hope, that proper understandings of particular linguistic phenomena, languages, language groups, or inter-language variations all require reference to interfaces.

The series is open to work by linguists of all theoretical persuasions and schools of thought. A main requirement is that authors should write so as to be understood by colleagues in related subfields of linguistics and by scholars in cognate disciplines.

The current volume seeks to bring together disparate strands of research on φ-features across the modules of morphology, syntax, and semantics. It also attempts to begin to delineate a programme of research that focuses on the formal properties of these features and what they have to tell us about the nature of the interfaces between grammatical modules.

David Adger
Hagit Borer

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Abbreviations

π	Person
ω	Number
1	First person
2	Second person
3	Third person
I, II, ...	Class labels (Latin, Tsez)
A	Transitive agent
ABS	Absolutive
ACC	Accusative
ACT	Active
ADDR	Addressee
AGR	Agreement
AOR	Aorist
APPL	Applicative particle
ASP	Aspect (particle)
ATR	Advanced tongue root
AUX	Auxiliary
AX	Accessory
BEN	Benefactive
COMIT	Comitative
conj	Conjunct
CPL	Completive
D	Dative argument
DAT	Dative
DECL	Declarative
DEM	Demonstrative
DFLT	Default
DIR	Direction marker (direct/inverse)

DL	Dative displacement
DL	Dual
DYN	Dynamic
EMPH	Emphatic
ERG	Ergative
EVID	Evidential
EX	Exclusive
EXPL	Expletive
FEM	Feminine
FS	Functional Sequence
FUT	Future
GB	Government and Binding
GEN	Genitive
GF	Grammatical Function
GPSG	Generalized Phrase Structure Grammar
HAB	Habitual
HON	Honorific
HPSG	Head-Driven Phrase Structure Grammar
I	Irrational/inanimate
IMPRS	Impersonal
IMPF	Imperfect, imperfective
IN	Inclusive
INCH	Inchoative
IND	Indicative
INF	Infinitive
INSTR	Instrumental
INTR	Intransitive
KASE	Structural case
LDA	Long-Distance Agreement
LFG	Lexical Functional Grammar
LOC	Locative
LRS	Low referential status

MASC	Masculine
MOOD	Mood
MP	Minimalist Program
MS	Marked scenario (particle)
NACT	Nonactive
NEUT	Neuter
NMLZ	Nominalization
NOM	Nominative
NPST	Nonpast
NR	Near
O	Transitive object
OBL	Oblique
OBV	Obviative
OT	Optimality Theory
PART	Participant
PC	Paucal
PCC	Person–Case Constraint
PF	Perfect, perfective
PL	Plural
POT	Potential
PPL	Participle
PRES	Present
PRET	Preterit
PREV	Preverb
PROG	Progressive
PRON	Pronominal base
PROX	Proximate
PRT	Particle
PST	Past
QUOT	Quotative
REFL	Reflexive
RG	Relational Grammar

S	Intransitive subject (structural)
SAP	Speech Act Participant
SG	Singular
SJNCT	Subjunctive
SPKR	Speaker
SUBJ	Subject (syntactic)
THM	Theme
TNS	Tense
TOP	Topic
TR	Transitive
u	uninterpretable
UG	Universal Grammar
VI	Vocabulary item

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1

Why Phi?

DAVID ADGER AND DANIEL HARBOUR

1.1 Introduction

Phi-features present a rare opportunity for syntacticians, morphologists, and semanticists to collaborate on a research enterprise in which all have an equal stake and which all approach with proprietary data and insights: syntacticians with intervention effects and the theory of Agree, morphologists with patterns of syncretism and hierarchies of person, definiteness, and so on, and semanticists with theories of binding and anaphora and theoretical approaches to the presuppositions and entailments that φ-features engender.

Given φ-features' transmodular relevance, it is inappropriate for syntacticians, semanticists, and morphologists to devise three monomodular accounts of φ-features in their own domains. Rather, the study of Universal Grammar must meet the concerns of all three fields with a single unified account and only an account of transmodular generality can be aptly called Phi Theory. Hence this volume's subtitle: Phi-features across Modules and Interfaces.

These research concerns were guiding questions at the 2004 workshop on φ-features held at McGill University, Montreal. The purpose of the conference was to bring together established and upcoming researchers in the syntax, semantics, and morphology of φ-features and to have them present recent advances of intra- and intermodular interest. The current volume derives from the presentations and discussion of the workshop.

In this opening chapter, we situate Phi Theory in Generative Grammar, focusing on the history of φ-features and how recent theoretical developments have given them greater prominence.

We are grateful to Jonathan Bobaljik, Paul Elbourne, Andrew Nevins, Jochen Trommer, and two anonymous OUP referees for comments on earlier drafts of this introduction. This volume grew out of a conference funded by the Canadian Social Sciences and Humanities Research Council, with supplementary funding from the School of Modern Languages, Queen Mary, University of London.

Before doing so, a word on what we mean by φ-features. We take φ-features to be those involved in predicate–argument agreement, typically person, number, and gender. Other features, such as those involved in honorification and definiteness also fall within this definition, while case, for example, does not. We will refer to the class of such features as Φ and to the individual features which make up this class as φ-features. As in any emerging theory, the limits of the empirical domain are not given a priori, and we expect the precise definition of φ-features to emerge only after much more work. This volume is merely a preliminary step in what we hope is a promising direction.

In the next sections, we trace a necessarily brief and incomplete history of attempts to tackle the development of a theory of Φ. Because the range of relevant works is enormous, our approach will be to tease out what we see as the major themes that have led to the current situation within transformational approaches to Generative Grammar. Because of the historical nature of this overview, we have organized the discussion into three domains: syntax, semantics, and morphology. However, the common themes that begin to emerge challenge the necessity of treating these domains of enquiry separately, a point taken up in the chapters of this volume.

1.2 Syntax

There are currently a number of areas of syntactic research in which φ-features play key roles: the cartographic analysis of verb movement and clitic placement, displaced agreement phenomena, the theory of case and agreement, to name a few (see references in the following subsections). However, the prominence afforded to φ-features in current syntactic theory is a recent phenomenon. Indeed, although agreement, as a general phenomenon, was afforded a syntactic treatment very early in generative work, it took a long time for attention to be paid to the properties of the linguistic items that entered into agreement.

There were two major impediments to the development of a Phi Theory: lack of appreciation of the relevance of Φ for syntactic theory in general, and lack of a robust theory of features. Syntactic concern tended to concentrate on the extent to which agreement processes could be assimilated to general syntactic mechanisms, while the substance of what did the agreeing, the internal nature of Φ, was largely ignored. Nevertheless, as we trace the history of topics where properties of agreement were argued to be syntactically relevant, we see that attempts to fine-tune the syntactic debate led naturally to efforts to articulate what the inventory of φ-features is and how their organization impacts on syntactic operations.

It did not take long for generative research to reach the idea that Φ, the substance of agreement, was composed of features and that these were manipulated by the syntax. Initially, in *Syntactic Structures* (Chomsky 1957), agreement was treated as a context-sensitive transformation, converting one category into another. For English subject agreement, this took the form:

(1) Number Transformation—obligatory (Chomsky 1957: 112)

Structural Analysis: X–C–Y

$$\text{Structural Change:}\quad C \rightarrow \left\{ \begin{array}{l} S \text{ in the Context } \mathrm{NP}_{sing}\text{–} \\ \varnothing \text{ in other contexts} \\ \textit{past} \text{ in any context} \end{array} \right\}$$

The idea is that the inflectional component of non-past sentences is rewritten as the morpheme *S* in the context of a singular NP, but as zero elsewhere. The notion of "singular NP" is technically dealt with via an atomic symbol, although this is clearly unsatisfactory, a placeholder for further analysis. The *S* morpheme undergoes morphophonological rules to surface as the appropriate form: /s/, /z/, /ɨz/. (Clearly, more irregular alternations, *be*∼*is*, *have*∼*has*, will require special provision.) This structural change transformation is, in essence, a rewrite rule, belonging primarily to the part of the grammar that specifies how the pronunciation of syntactic structures is effected (cf. Bobaljik, this volume).

By the time of *Aspects of the Theory of Syntax* (Chomsky 1965), however, the approach to agreement had become both featural and syntactic. Two pieces of work fed into this change of perspective. First, a fully transformational account was offered by Postal (1966). Postal suggested that a Spanish noun phrase like *unos alumnos* "some students" consisting of a determiner and a head noun had the representation:

(2) $[_{NP}[_{Article}$ ***un***$]$
$[_{Noun}[_{Stem}$ ***alumn***$]$ $[_{Affix}$[Gender M] [Number Pl]]]]

An obligatory transformation copies the nominal affix to the determiner:

(3) $[_{NP}[_{Article}$ ***un*** $[_{Affix}$[Gender M] [Number Pl]]]
$[_{Noun}[_{Stem}$ ***alumn***$][_{Affix}$[Gender M] [Number Pl]]]]

This receives the appropriate spellout after the morphophonological rules have applied:

(4) $[_{NP}[_{Article}$ ***un***$[_{Affix}$[***o***]***s***]]
$[_{Noun}[_{Stem}$ ***alumn***$][_{Affix}$[***o***]***s***]]] = ***unos alumnos***

Second, Harman (1963) had begun to exploit in the syntax the descriptive power afforded by symbols that were internally complex. Chomsky (1965) combined these approaches by positing an N node that branches into a feature matrix containing various features, such as gender, number, case:

(5)

$$\text{Article} \rightarrow \begin{bmatrix} \alpha\,\text{gender} \\ \beta\,\text{number} \\ \gamma\,\text{case} \end{bmatrix} / \_\_ \cdots \begin{bmatrix} +\text{N} \\ \alpha\,\text{gender} \\ \beta\,\text{number} \\ \gamma\,\text{case} \end{bmatrix}, \text{ where [Article} \ldots \text{N] is an NP}$$

This rule assigns the features of the noun to the article, effectively restating Postal's analysis with features rather than morphemes. Such feature matrices could then be matched with lexical items. The structure of these features was modeled along the lines of the structure of phonological features, as motivated by Halle in a number of publications following work by Jakobson (Halle 1962, Jakobson, Fant, and Halle 1963).

This approach places φ-features squarely in the syntax: they undergo syntactic operations triggered by their positioning in syntactic structures. However, the goal in *Aspects* was to provide an account for the phenomenon of agreement generally. There was no interest in developing a theory of the individual components of agreement.

Following *Aspects*, little more attention was paid to the development of a theory of Φ. In fact, as Gazdar, Klein, Pullum, and Sag (1985: 18) observe:

> But [after *Aspects of the Theory of Syntax*], development in the theory of syntactic features basically stopped. Although generative grammarians continued to assume features in their descriptive apparatus, hardly any generative grammarians attempted to give syntactic features the kind of well-defined formal underpinnings that, say, the theory of phrase structure rewriting rules had. George Lakoff's 1965 dissertation (published as Lakoff 1970) was an honorable exception, but it influenced the field more toward the development of abstract deep structures and complex transformational derivations than toward appropriate exploitation of features in phrase structure description, despite the rich proposals for feature analysis that it presented.

They conclude that "the theory of features fell gradually into a state of chaos."

For their own part, during the 1980s, Gazdar, Klein, Pullum and Sag did provide a theory of features in Generalized Phrase Structure Grammar in the context of which a theory of φ-features could have been developed. However, the φ-features that they themselves posited merely recapitulated the traditional descriptive labels (e.g., ⟨PLU, +/−⟩ for plural∼non-plural, ⟨PER, 1/2/3⟩ for first∼second∼third person) and so did not provide any deep insight into Φ itself. The same tendency held sway in the Government and

Binding tradition (e.g., Lumsden 1987) and in Lexical Functional Grammar (Bresnan 1982).

However, if the field was in chaos with respect to its views of features, the chaos was neither total, nor uncreative. Notably, Muysken and van Riemsdijk (1986: vii) observed:

> Syntactic features have played a somewhat marginal role in the development of the theory of grammar over the past fifteen or twenty years. Even basic questions such as "how many are there?", "what are they?", "how do they distribute over syntactic structures?" were hardly addressed, let alone answered. Nevertheless, it is clear that syntactic features do play an important role in syntax. Few, if any, grammarians today hold, that syntactic categories are unanalyzable atomic primitives, and any additional intrinsic properties of syntactic categories are expressed in the form of features. It would appear to be high time, therefore, to examine the theory of syntactic features in a more systematic way.

Moreover, Muysken and van Riemsdijk recognized Φ as a potential source of enlightenment in this domain. Indeed, of the several strands of research that were eventually to place φ-features in a prominent position in syntactic theory, they recognized two: the notion of rich agreement (Taraldsen 1980, Rizzi 1982), and hierarchies of case marking (Silverstein 1976 [1986]). They also drew attention to another work of this period, that was eventually to have major influence (Hale 1973; see Section 1.4 below.)

In the twenty years since Muysken and van Riemsdijk's volume, four major strands of syntactic research have conspired to place φ-features in a position of prominence. The first and second—work on the pro-drop parameter and then, later, on height of verb movement—led to a concept of "rich agreement", the eventual explication of which has naturally fed into questions about the nature of Φ. Third, the role of case in argument licensing has inspired research into the mechanisms of case and agreement. This, in turn, has led to notions of φ-completeness versus φ-defectiveness, notions that can only be fully justified in the context of an explicit Phi Theory. Fourth, the Person Case Constraint—the impossibility of certain φ-feature combinations in multiple agreement/clitic systems—has recently received much attention as attempts are made to reduce it to other syntactic phenomena. In the subsections that follow, we review these developments and highlight key contributions, conjectures, and results.

1.2.1 *Rich agreement*

The importance of rich agreement was first noted in regard to pro-drop (Taraldsen 1980). Essentially, in languages, like Italian and Greek, where the verb reveals the person and number of the subject, pro-drop is possible; in languages where it only partially reveals it, such as German and English, it is not. The descriptive generalization is that when agreement is "rich", it licenses a null subject.

The internal richness of Agr, that is, how much information is specified in Agr, became crucial to later analyses of subject pro-drop (Rizzi 1982), and of the generalized pro-drop found in polysynthetic languages (Jelinek 1984). Curiously, however, little attention was paid to what the featural composition of Agr actually was and how it related to the intuitive notion of rich agreement.

However, following Emonds (1978) and then, especially, Pollock (1989), it was noted that rich agreement potentially correlated with height of verb movement: for instance, Romance finite verbs, which show rich agreement, move higher than both English finite verbs and Romance participles, which agree less fully. The idea was thoroughly explored for a wide variety of Germanic languages (beginning with a series of works by Platzack and Holmberg, e.g., 1989). This led to attempts to show two things: on the synchronic side, that Germanic languages that had retained verb movement possessed correspondingly richer subject agreement (see, especially, Rohrbacher 1994); on the diachronic side, that the decline of subject agreement and verb movement proceeded in tandem (e.g., Roberts 1985). This work ultimately failed to shed light on the nature of φ-features per se, though, for two reasons. First, the biconditional correlation between rich agreement and verb movement proved to be too strong (see Bobaljik 2003 for thorough overview and formulation of a weaker generalization). Second, it focused on the paradigm, rather than the φ-features that generate paradigms, as the basic explanatory unit in terms of which richness was to be explicated. Despite these failings, the research program did succeed in placing Φ-related morphosyntax center stage.

In addition, the research program stemming from Pollock's work, which used the different landing positions of verbs in French and English to argue for a splitting of I(NFL) into separate tense and agreement projections, progressed to more fine-grained decompositions. For instance, Shlonsky (1989) argued, on the basis of Modern Hebrew (morpho)syntax, for separate PersonP, NumberP, and GenderP (see Linn and Rosen 2003 for similar arguments based on Euchee); and Poletto (2000) argued, on the basis of the distribution of subject clitics (SCL) in Northern Italian dialects, for a structure that splits the person features into separate projections:

(6) $[_{NegP}\ [_{NumP}\ \text{SCL}\ [_{HearerP}\ \text{SCL}\ [_{SpeakerP}\ \text{V}\ [_{TP} \ldots]]]]]$

(Poletto 2000: 31)

Here we see the connection between syntactic position and richness of agreement captured by projecting φ-features as parts of the basic clausal backbone.

Another vein of research where φ-features are claimed to have a presence in the extended projection of the clause involves the fine structure of the left periphery (Rizzi 1997): like IP, CP has come to be decomposed into several different projections and some researchers have argued for relationships between these and various Φ-categories. The general viewpoint taken is that person-like features are represented on high C-domain heads that encode whether sources of knowledge, opinion or belief are shared between the speaker and other discourse participants. This idea has been used to capture a wide range of data, from evidentiality and logophors (Speas 2004, Tsoulas and Kural 1999) to long-distance binding (Sigurðsson 2004) and person hierarchies (Bianchi 2006).

1.2.2 *Agreement and case*

We can see the general approach to the connection between φ-features and case licensing emerge in *Lectures on Government and Binding* (Chomsky 1981), which influenced much work afterwards. There, what was important once again, however, was the feature bundle Agr, which was implicated in theories of case and government. Agr was assumed to work as a single syntactic unit, just as in the original approaches to the role of rich Agr in licensing null subjects discussed directly above.

This approach to Case and syntactic licensing allowed a fairly successful implementation of an important generalization connecting Case and φ-features: overt subjects with nominative case are restricted to clauses specified with tense and agreement features (that is, finite clauses).

Within the Government and Binding framework, this idea was captured by the following kind of specification (see Chomsky 1981):

(7) $\mathrm{I}_{[+\mathrm{tense}\ +\mathrm{Agr}]}$ assigns nominative case to its specifier

Note that Agr is itself taken to be a feature here. The plus value may be taken as suggesting a specification of φ-features, though none in particular are mentioned.

This proposal now extends naturally to a potential challenge for the original generalization which is raised by languages like European Portuguese, where a nominative subject is, in fact, possible in an infinitive just when the infinitive is inflected for agreement (see Raposo 1987 for Portuguese, and George and Kornfilt 1981 for similar data from Turkish inflected gerunds):

(8) É correto nós ignor-ar-mos isto.
Is right us-NOM ignore-INF-1PL this
"It is right for us to ignore this."

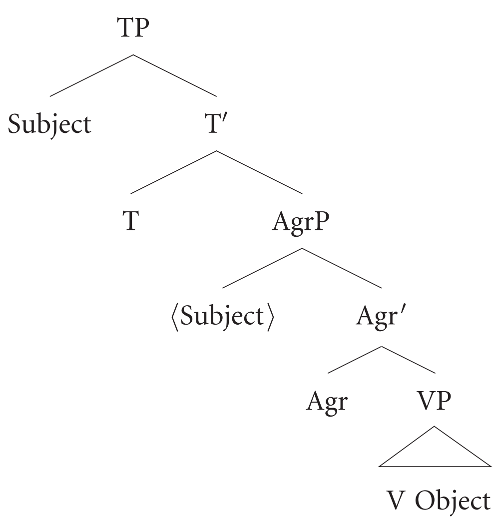
We can capture the data by assuming that the following holds universally:

(9) [+Agr] assigns nominative case to its specifier

Other analyses treating Agr itself as a feature are Haegeman's (1986) treatment of West Flemish subject licensing, and, later, Rizzi's (1990) theory of wh-movement, where it was used to explain the possibility of subject extraction after certain complementizers. Throughout this period, no attempt was made to explain the features that comprised Agr or to explicate the notion of rich Agr, [+Agr], in terms of a given inventory of φ-features. As discussed in Section 1.2.1, it was not until the work of Platzack and Holmberg (1989) and Rohrbacher (1994), that there was an attempt to explicate the meaning of [+Agr] in terms of properties of the agreeing verbs: essentially, in terms of how many of a language's pronominal categories corresponded to unique agreement affixes (see also Vikner 1995).

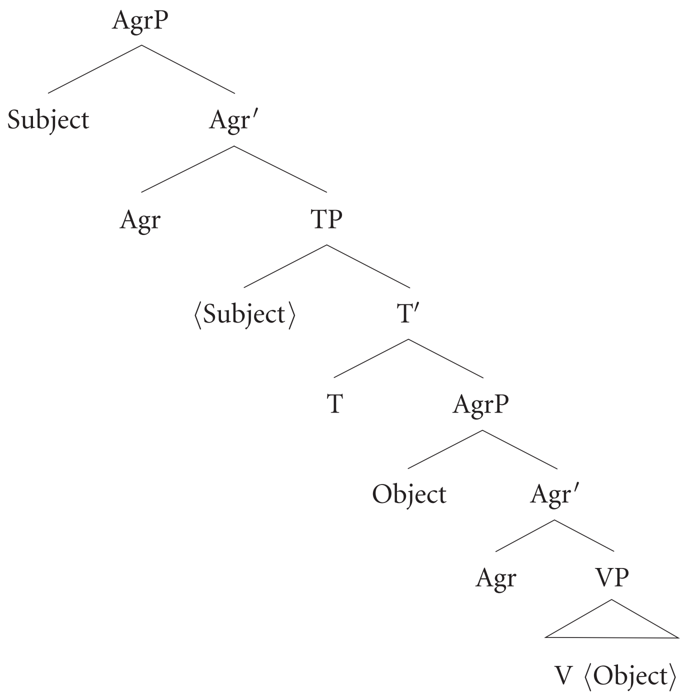
As previously mentioned, Pollock (1989) argued that apparently atomic syntactic categories should be split into their constituent features. Moreover, these features themselves should project as heads which could act as landing sites for verb movement, giving the following clause structure:

(10)



Belletti (1990), on the basis of pursuing a transparent relationship between the internal morphological structure of words, and the syntactic structure of clauses (the Mirror Principle of Baker 1988), suggested that AgrP selects TP rather than the structure in (10), while Chomsky (1989) suggested that there were two AgrPs, one below T, which is associated with object agreement, and one above, associated with subject agreement:

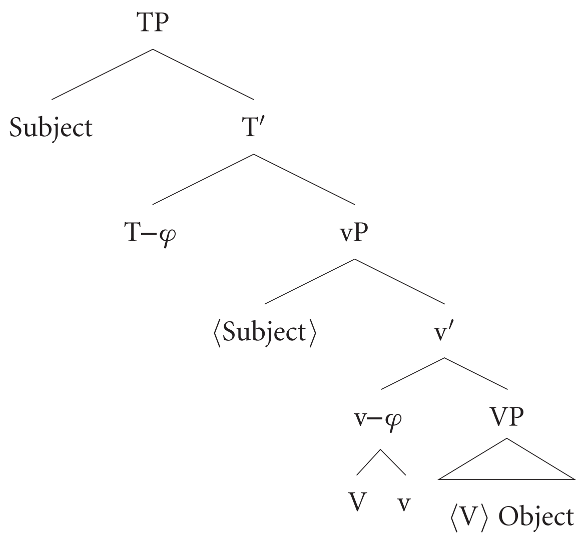
(11)



This enriched system allowed a more general approach to case assignment, and Chomsky (1993) proposed that structural Case in general is checked in the specifier of Agr heads. Each Agr acted as a "mediator" for the case features of the heads of the phrases they selected (TP and VP). Structural Case checking can then be seen as arising from an agreement relation.

However, there were a number of conceptual arguments against the projection of Agr heads in clause structure. In *The Minimalist Program*, Chomsky (1995, chapter 4) argued that heads which project without semantic effects, such as Agr, should be dispensed with. His alternative suggestion for maintaining the link between φ-features and Case comes from investigations into the syntax of argument structure (especially Hale and Keyser 1993). He proposes that subjects are introduced by a functional head, v (Chomsky 1995: 315 and references therein; see also Kratzer 1996 among many others). This head can be endowed with φ-features and hence accusative case checking capabilities. Similarly, T is endowed with φ-features that Case license the subject, which itself moves to T's specifier:

(12)



In more recent versions of the Minimalist Program, Chomsky (2001) has maintained the intuitive link between agreement and structural Case checking, however, he has made proposals for φ-features themselves. Specifically, person and number features play distinct roles in structural Case checking: when one is absent from a head, the head is defective and Case checking is impossible (this is how he analyses the non-finite T of raising constructions).

The idea that the separate features that make up Φ act independently in the syntax has been developed in analyses of complex agreement phenomena. These analyses differ from the work discussed above in that their focus is not the connection between Case and agreement, but a general theory of the syntactic dependencies established by the operation Agree (Chomsky 2000). An example of such work is Béjar (2004), which investigates the classical problem of Georgian agreement, where the controller of agreement on the verb is not determined by syntactic position or grammatical function, but rather by φ-featural richness. Béjar concentrates on examples which show that person agreement on a verb can arise from one argument whereas number agreement comes from another. For example, in (13), the second person singular object triggers person agreement and the first person plural subject triggers number agreement:

(13) g- k'lav-t
2SG-kill- PL
"We kill you (singular)." (Hewitt 1995: 132)

This kind of agreement has been treated morphologically in the past (Anderson 1992, Halle and Marantz 1993). Béjar argues that a more satisfying explanation is available when one allows the features within one Φ-set to establish disjoint Agree relations separately in the syntax, and she extends this basic idea to a general analysis of what she terms "agreement displacement phenomena" (see also Řezáč 2003, and for earlier ideas along the same lines Ritter 1995 and Taraldsen 1995).

1.2.3 *Person Case Constraint*

The theories of Case and agreement come together in a single grammatical phenomenon that has proved to be a very productive domain of application and refinement of the theory of φ-features in recent years: the Person Case Constraint.

Perlmutter (1971) observed an intriguing restriction on the combination of dative and accusative clitics in Spanish: the accusative in such a situation must be third person. This constraint is known in the literature as the **me lui* Constraint, or Person Case Constraint (PCC). We give here an example from French (see Anagnostopoulou 2003 and Haspelmath 2004 for many other cases):

(14) a. Agnès me la présentera.
Agnès 1SG 3SG.FEM present.FUT.3SG
"Agnès will introduce her to me."

b. *Agnès me lui présentera.
Agnès 1SG 3SG.FEM present.FUT.3SG
"Agnès will introduce me to her."

c. Agnès me présentera à elle.
Agnès 1SG present.FUT.3SG to her
"Agnès will introduce me to her."

Example (14a) shows that dative and accusative clitics may cooccur. However, such combinations are only licit if the accusative is third person, hence the contrast between (14a) and (14b). In French, such argument combinations can only be expressed periphrastically, as in (14c).

Bonet (1991) gives a tentative approach to this phenomenon (developed more fully in Bonet 1994) which uses a filter to block the morphological realization of non-third person accusatives in the presence of dative clitics. However, more recently, there have appeared a range of syntactic analyses of the PCC, which crucially appeal to the various φ-features that make up agreement. These approaches have attempted to connect the PCC to various other phenomena. For example, Boeckx (2000) and Anagnostopoulou (2003) have proposed that it is connected to the restrictions on the appearance of first and second person nominative objects in Icelandic; Richards (2005) connects it with cross-clausal extraction in Tagalog; Bianchi (2006) connects it to inverse agreement systems found in languages like Plains Cree and Bobaljik and Branigan (2006), to the Spurious Anti-Passive construction found in Chukchi in configurations that are reminiscent of inverse agreement; Ormazabal and Romero (2002) draw a connection to animacy on the basis of *leísta* dialects of Spanish, and Adger and Harbour (2007), in a somewhat related vein, have connected it with patterns of case syncretism across different languages. Finally, Nevins (2007), applying, in the syntax, ideas from phonological feature formalisms, comes the closest of any researcher to tackling the full typological variety of the PCC reviewed by Haspelmath in his (2004) crosslinguistic survey of the phenomenon.

There is an interesting parallel here with the Georgian agreement effects discussed above: what was once thought to be a paradigm case of a morphological phenomenon can be understood syntactically when we pay attention to the behaviour of the components of Φ (see especially Béjar and Řezáč 2004 for the impact of the PCC on the theory of Agree).

The research displays an exciting lack of consensus, even if some themes are clear: feature structure—whether in terms of competition, or the behaviour of Agree, or the specification of arguments—lies at the heart of these analyses. The sub-Φ-structure is crucially implicated in all of these analyses and so a well articulated theory of φ-features is crucial for such work.

1.3 Semantics

Although Phi Theory may have taken a time to come into its own in syntax, related issues have enjoyed long attention in semantics. These begin in the philosophico-semantic tradition, in which philosophers aimed to supplement the Fregean and Tarskian theories of formalized languages (Frege 1879, Tarski 1935) for the analysis of natural language (beginning with Frege 1892 and Russell 1905 and leading to the important work of Davidson 1967, Montague

1970, 1973, Lewis 1972, which attempted to connect contemporary philosophical semantics with grammatical theory). Key amongst the requisite additions relevant here were notions of indexicality and presuppositionality, and mechanisms for the representation of quantities. We address each of these below.

1.3.1 *Indexicality and presuppositionality*

The category of person was an early focus of research in the philosophy of language. It arose naturally in two regards: first, indexicals (Jespersen's "shifters") were an obvious domain that was not embraced by semantic theories designed for the elucidation of mathematics; second, the interest in the logical properties of proper names led naturally to attempts to deal with the semantics of pronouns and deictics (e.g., Russell 1940). The most influential work in the philosophical tradition is that of Kaplan. Kaplan (1977 [1989]) formulated the thesis that indexicals are directly referential, entailing that their semantic value is fixed purely by the context of the speech act and cannot be acted on by logical operators. Recently, a variety of evidence has called this view into question. Schlenker (2003), for instance (see also von Stechow 2003, Anand and Nevins 2004), has argued against the Kaplanian view on the basis of Amharic sentences such as (15), which can be used to describe John's saying of himself "I am a hero":

(15) ǰon ǰəgna nə-ññ yɨl-all
John hero be.PF-1SGO 3MASC.say-AUX.3MASC
"John says that he is a hero." (Schlenker 2003: 68)

Schlenker demonstrates that the embedded clause in Amharic is not a quotation. This shows, straightforwardly, that the semantic value of "I" is not fixed by the context of utterance, as "I" refers to John, not to whoever utters (15).

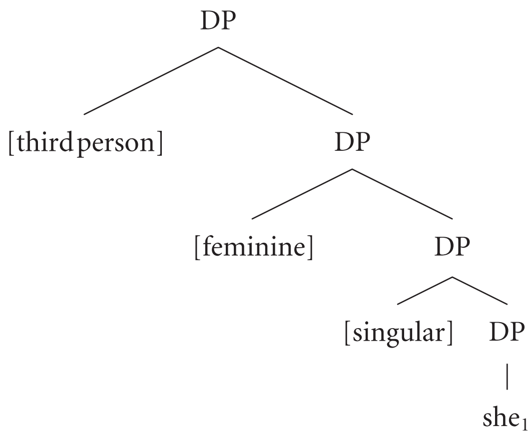
Schlenker's own treatment of the semantics of person pursues an idea first developed by Cooper (1983) with respect to gender, namely, that it is presuppositional. To see the intuition, consider the following dialogue:

(16) "Tell me about Alex."
"Evidently she's married: you can see the wedding ring in this photo of her hand."

If the first speaker knows that Alex is a man, it would be impossible to attempt to correct the second speaker by saying "No, she isn't married"; this would be taken as accepting that Alex is a woman and disagreeing about his/her marital status. So, Alex's gender does not form part of the assertion in "She's married", but rather is a presupposition. This accords with the intuition that "She's married", said of a husband, is not false, but infelicitous.

An influential implementation of this idea, which pursues Tarski's intuition that reference arises via an assignment of values to variables, is Heim and Kratzer's (1998). They propose that φ-features are syntactically adjoined to pronominals and that their semantic contribution is a presupposition that restricts the range of the assignment of values to variables. For instance, the structure of the pronoun *she*, say, is:

(17)



(Heim and Kratzer 1998: 244)

The features are partial identity functions (indicated by the colon in (18)). That is, [feminine] maps individuals to themselves (an identity function), subject to the proviso that the individual is female; it is undefined otherwise (hence, a partial function).

(18) $[\![\text{feminine}]\!] = \lambda x : x \text{ is female. } x$

Applying this to "She is married", we have that the lower nodes of the DP are assigned to Alex, however, when we move up the tree to [feminine], the partial function fails to return a value as Alex is not female.

Schlenker applies this kind of approach to person features too. He proposes a meaning for the first person feature so that it is only defined when the pronoun bearing the feature refers to a group which includes the speaker who utters the sentence in the context, and a similar meaning for the second person feature. He then proposes that third person pronouns are essentially chosen as semantic defaults (see also Sauerland, this volume).

However, an interesting semantic problem arises on the presuppositional approach to person and gender features, with respect to bound variable readings of personal pronouns. Consider the following example, where gender is relevant: in a coed class, where the only person to have done the assigned homework is Mary, one can say:

(19) Only Mary has done her homework.

The important fact about such uses of personal pronouns (first noted by Partee 1989 with respect to the first person) is that they can break free of their presuppositions: (19) means, informally, "Look at the set of people who have done their homework: only Mary is in that set". So, the pronoun "her" does not constrain the statement to hold only of females, contrary to what one would expect given (18). Elements of this debate have thrown light on the complex interplay between semantic, syntactic, and morphological aspects of φ-features (see, for instance, Déchaine and Wiltschko 2002 and Rullman 2004). Several aspects of the debate are discussed by Heim (this volume).

In addition to person and gender, another φ-category, number, has been a productive area of philosophical investigation (e.g., Goodman and Quine 1947, Quine 1960). Given that philosophical semantics has its origins in the foundations of mathematics, set theory is, unsurprisingly, frequently used to represent notions of singularity and plurality. An influential version of this is the lattice-theoretic treatment of plurals (Link 1983). The concepts this work introduced have been deployed in the treatment of plurality, masshood, distributivity, collectivity, and a wide range of aspectual phenomena (Krifka 1992, Verkuyl 1993, Schein 1993, Lasersohn 1995, Landman 1996, Doetjes 1997, Chierchia 1998, Ojeda 1998, Winter 2001, amongst others). Interestingly, in contrast to person and gender, no presuppositional account of number has, to our knowledge, been offered (though Heim and Kratzer 1998: 245 suggest the possibility). It may be (Nevins, p.c.) that, if definiteness were incorporated more fully into the treatment of Φ, it would be possible to attribute all presuppositionality effects to definiteness and to simplify the representation of person and gender. The non-presuppositional treatment of number would then be the norm for other Φ-categories. For steps in this direction, see Kratzer (2006).

1.3.2 *Agreement: syntactic or semantic?*

We have seen that person, number, and gender can be treated as presupposition inducing features. However, gender is of two types: semantically contentful and purely grammatical. An obvious issue for the presuppositional approach is whether grammatical gender is amenable to a purely semantic approach.

For example, in German, *Mädchen* "girl" is grammatically neuter, as can be seen from the form of the relative pronoun that it controls:

(20)

das	Mädchen,	*das/*die*	das Buch ließt
the.NEUT	girl	that.NEUT/that.FEM	the book read.PRES

"the girl who reads the book"

The relative pronoun is obligatorily neuter, agreeing with the noun and article. The feminine relative pronoun, required in an example with a grammatically feminine noun such as (21) below, is impossible.

(21)

die	Frau,	*die/*das*	das Buch ließt
the.FEM	woman	that.FEM/that.NEUT	the book read.PRES

"the woman who reads the book"

However, if the girl is referenced by a pronoun, the feminine, rather than the neuter, is used:

(22)

Das	Mädchen	sagt,	daß sie/*es	das Buch ließt.
the.NEUT	girl	say.PRES	that she.FEM/it.NEUT	the book read.PRES

"The girl says that she is reading the book."

On the assumption that the pronoun's function is the semantic one of picking out a referent, these examples appear to show that the neuter agreement that *Mädchen* "girl" triggers is sensitive to a syntactic rather than a semantic feature.

Dowty and Jacobson (1988), however, argue against this idea, as part of a general program to minimize the contribution of syntax, and suggest instead that agreement should be treated as an essentially semantic phenomenon. Pollard and Sag (1994) provide evidence for this approach on the basis of a range of phenomena where simple feature matching in the syntax would give the wrong results. A striking case of this is reference transfer of the following sort (a modification of Nunberg's 1979 *ham sandwich* example):

(23) The hash browns at table six is/*are getting angry.
"The person at table six, who ordered the hash browns, is getting angry."

Here the agreement on the verb seems to be with the referent of the subject, the person who ordered the hash browns, rather than with the syntactic specification of *the hash browns*. Collective nouns in British English provide further evidence that differences in number agreement correlate with differences in interpretation:

(24) The committee has/have voted today.

For such dialects, the agreement on the auxiliary correlates with interpretational effects on the subject, independent of singular number marking on the noun. Sauerland and Elbourne (2002) note a number of other semantic phenomena affected by this kind of agreement.

The theoretical point made by Dowty and Jacobson is that verbal agreement features can contribute to semantic interpretation. This constitutes a prima facie difficulty for the syntactic approach to agreement outlined above, where agreement on the verb is supposed to lack semantic content.

1.4 Morphology

1.4.1 *Precursors*

Morphology is a natural place to look for a theory of the internal featural constitution of φ-structures. To see why, consider the Tok Pisin pronoun paradigm (Foley 1986: 67):

(25)

Person	Singular	Dual	Plural
1IN	—	yumitupela	yumi
1EX	mi	mitupela	mipela
2	yu	yutupela	yupela

Observe that the meaning/pronunciation of the first person inclusive is the sum of the meaning and pronunciation of its parts: *yumi*… means *yu* and *mi*. This suggests that first person inclusive, first person exclusive, and second person are not sui generis, but are composed of more fundamental features. The same conclusion—that traditional categories of description are composites of features—is underlined by number in (25). Observe that the dual, *tupela*, is the plural, *pela*, plus something else. Thus, these numbers share part of their meaning, non-singularity, and part of their sound, *pela*.

The phenomenon of syncretism, as discussed by Hale (1973, see also Halle 1997), reveals the same fact about duals and plurals. In Warlpiri, in certain contexts, plural agreement occurs where, on purely semantic grounds, we would expect dual; call these *DL-contexts. Hale accounts for this by supposing that dual is a composite [a b], where [a] means simply non-singular (cf., Tok Pisin *pela*) and [b] restricts the non-singularity to duality (cf., Tok Pisin *tu*). What is special about *DL-contexts is that [b] is deleted, making dual [a b] identical with plural [a].

Thus, we see that core morphological phenomena lead quickly to a set of research questions for which the development of a theory of φ-features is necessary. It is, therefore, surprising to discover that φ-features are all but wholly absent from such volumes as *Theoretical Morphology* (Hammond and Noonan 1988) and *The Handbook of Morphology* (Spencer and Zwicky 1998). However, on closer inspection, there are legitimate reasons for this absence. As Spencer and Zwicky observe, morphology was neglected in deference to syntax and phonology in early developments of generative grammar (as we have indicated above, agreement was treated as the result of a rewrite rule or syntactic transformation); only with Halle's (1973) programmatic statement for a generative theory of morphology did interest begin to center on morphology as research domain in its own right. The Lexicalist interpretation of Chomsky (1970) gave this extra life as the debate about morphology could be cast in terms of the division of labor between the lexicon and syntax (see Borer 1998 for overview). To the extent that the nature of inflection was studied at this time, it was as a means of examining how labor was shared between modules of the grammar. For instance, Anderson (1982) uses agreement in Breton verbs and prepositions to argue that agreement is syntactically autonomous and subject to syntactic processes; it is only due to such processes that the agreement comes to be incorporated into the word of which it ultimately forms part. As such, agreement phenomena were counterexamples to the generalized Lexicalist hypothesis. However, in this context, the internal constituency of φ-structures was not overly of interest.

Nonetheless, two major precursors to a theory of φ-features did emerge at this time, namely, the above-mentioned Hale (1973) and Silverstein (1986). Both of these works present articulated inventories of φ-features which go beyond the mere "featurization" of traditional grammatical categories, and give thought to what minimal set of features will generate all of the attested categories. In particular, both authors stress the idea that person categories, like the first person inclusive, and number categories, like the dual, are not features in their own right (e.g., [+inclusive] or [+dual]), but are composites of features (in Silverstein's system, [+ego +tu] and [+plural +restricted]).

Hale's work has been particularly influential for several reasons. He presented analyses of data types that have since become mainstays for the field. For instance, the 1973 paper treats syncretism between morphological categories in a way that prefigures the impoverishment analysis of Bonet (1991) and later authors. Similarly, Hale (1997), versions of which had been in circulation several years earlier, introduced the notion of composed number and emphasized its relevance as an alternative demonstration of the fact that the dual is not a feature in its own right, but an overlap of the feature specification of singular and plural.

(26) a. Pam **wari**.
that run.PF
"He/she ran."

b. ***Puma*** **wari**.
those run.PF
"They (two) ran."

c. ***Puma*** yùutu.
those run.PF
"They (plural) ran." (Hale 1997: 74)

Hale's work has been incorporated into key studies of Φ-structure, especially, Bonet (1991) and Noyer (1992), and into work on morphology in general, most notably, Halle and Marantz (1993) and Halle (1997).

1.4.2 *The composition of* Φ

In morphology, the onset of Phi Theory proper must be attributed to the two works by Bonet and Noyer just cited. In these, the authors were concerned with issues of what φ-features there are, how they are structured, what operations the morphology can perform on them, and how such operations are constrained.

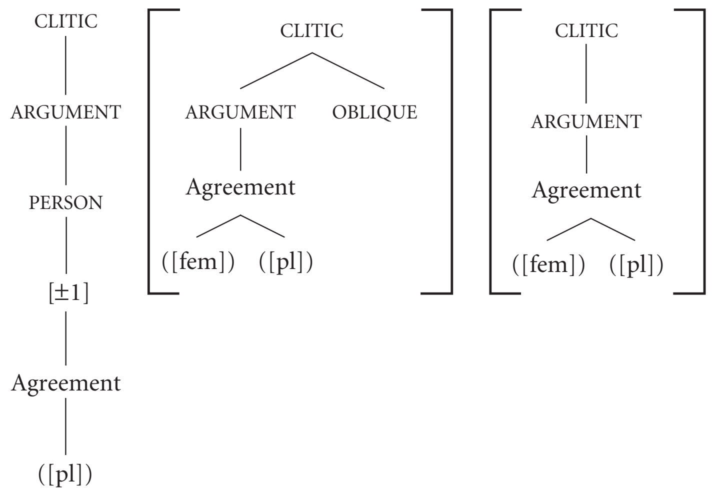
Bonet's investigation (see also Bonet 1995) was motivated, in large part, by an attempt to account for non-transparent surface outputs in clitic combinations, a topic that (*pace* Hale 1973) had "hardly received any attention" (Bonet 1991: 10). A classic case of this phenomenon concerns the combination, in Spanish, of the third person masculine singular clitics for indirect and direct objects, respectively, *le* and *lo*. When the context demands that the clitics cooccur, they surface, not as *le lo*, but as *se lo*. Perlmutter (1971), who first drew attention to the phenomenon in the Generative context, posited what was, essentially, a phonological rewrite rule:

(27)
$$\underset{1}{\begin{bmatrix}\text{PRO}\\ \text{III}\\ \text{Dat.}\end{bmatrix}} \underset{2}{\begin{bmatrix}\text{PRO}\\ \text{III}\\ \text{Acc.}\end{bmatrix}} \rightarrow \textit{se},\ 2$$

As Bonet observes, an equally legitimate rule, on this approach, would introduce the syllable *ba* instead of *se*; it is coincidental that what emerges when *le* is prevented from surfacing is another clitic, the reflexive *se*, rather than any other phonological string. The issue, then, that Bonet investigates is how the φ-structure of *le* is transformed into that of *se*.

Bonet's theory involves several notions that have been key to later developments of morphological Phi Theory. First, she adopts (p. 58) a hierarchical organization of φ-features:

(28) First/Second Third Person Dative Third Person Accusative



Here, the "defining properties of the clitics" are in small capitals, the agreement features themselves in lowercase. (Bonet is ambivalent as to whether the geometrical feature structure, an idea she attributes to Marantz, constitutes morphological structure in its own right—whether syntax deals in feature bundles that are mapped onto geometrical structures in the morphology—or whether the geometries are simply syntactic structures "pruned" of extraneous information.)

The feature structures in (28) serve to constrain morphological operations and to define metrics of markedness and defaulthood. Basically, the more structure, and so features, a φ-set contains, the more marked it is. Bonet accounted for the *le lo* → *se lo* neutralization by supposing that morphology can delink lower parts of the structure. In particular, given that the structure for *se* is a substructure of that for *le*, delinking the lower part of the *le* structure reveals the *se* structure, explaining why *le* becomes *se*, rather than any other syllable of the language.

Noyer (1992), like Bonet, was concerned with the organization of φ-features and operations on them (see also Noyer 1998). In particular, he proposed the process of Fission, whereby a single syntactic terminal node is split into separate positions for multiple phonological strings (see Harbour, this volume, for an overview of the account). However, he also resumed another theme of research, from Hale (1973) and Silverstein (1976 [1986]), namely, the inventory of φ-features. Investigating a wide variety of languages, some of them in great depth and with great insight, he arrived at two number features [$\pm$singular] and [$\pm$augmented], and three person features, [$\pm$author], [$\pm$hearer], and [$\pm$participant]. Moreover, Noyer showed that languages do not all use every one of the features in their person/number inventories. For instance, a language with singular, dual, and plural, such as Kiowa (Harbour 2007), uses both number features; a language with just singular and plural, such as Mam (England 1983), uses only [$\pm$singular]; and a language with a dual–plural distinction in first person inclusive, and a singular–plural distinction in all other persons, such as Ilocano, uses just [$\pm$augmented].

Since Noyer's work, more extensive typological research has been undertaken with regard both to person and to number (Corbett 2000, Cysouw 2003, Siewierska 2004). And so, it remains to be seen whether Noyer's inventory of features naturally extends to the cases that he did not directly consider.

Not only did Noyer present detailed arguments for the quantity and definitions of his features, but he even argued for the necessity of their bivalence. He did this primarily by appeal to α-rules, that is, to rules that switch the values of particular features, or that are triggered when pairs of features have opposing values. Most notably, he argued for the bivalence by motivating α-rules in the treatment of person in Mam and number in Kiowa-Tanoan. This issue has been taken up since by Harley (1994), McGinnis (2005), Harbour (2005), amongst others. The significance of φ-feature valence extends beyond morphology: Béjar's syntactic treatment of Georgian agreement discussed above crucially relies on the absence of a feature rather than its negative specification; bivalence permits a three-way distinction between assertion, negation, and absence of a property, that is not replicable with privativity, consequently, the two feature notations can be semantically distinguished.

So long as number features were assumed to be [singular], [dual], [trial], and so on, that is, mere "featuralization" of traditional descriptive labels, their definition attracted little attention from, and paid little heed to, semantics. A plausible reason for this is that both morphologists and semanticists may have taken semantic methods to be overly complex for the treatment of such apparently simple notions as "one", "two", "three". Such overlap in interest as there was came in the domains of collectives and distributives (e.g., Ojeda 1998 and Corbett 2000) and in pluralities of events (e.g., Mithun 1988 and Lasersohn 1995). However, as work like Noyer's moves morphological definitions of number away from the obvious and into the abstract, questions begin to arise concerning the semantic nature of these definitions: are they exclusive to morphology, or are they shared with other semantic systems?

Developing Noyer's system, Harbour (2007) has demonstrated that the primitives that morphologists require in the treatment of complex agreement syncretisms are the same as those semanticists require in the representation of collectivity, distributivity, and basic cardinality (singular, dual, plural). Subsequent investigation (Harbour 2006a, 2006b), building also on semantic work by Krifka (1992), has shown that the formal notions developed in the treatment of aspect are almost exactly the feature definitions required to generate the number systems attested across the world, including even the rarest, incorporating, for instance, unit augmented, or trial, or greater and lesser paucal.

1.5 Markedness

Markedness has been a major theme in φ-theory; not only was it addressed by many of the authors mentioned already above (Bonet, Harley, Noyer, Ritter, Silverstein), but it goes back to the earliest work on features by Jakobson and Trubetskoy (Haspelmath 2006 for an overview), and has become a focus of some debate since (e.g., Cowper 2005, Nevins 2007, Sauerland, this volume).

Morphologically, one can distinguish "formal" and "functional" markedness (Dixon 1994). Formal markedness concerns, quite simply, whether a form is overtly marked. For instance, for English nouns, the singular is unmarked, the plural marked: compare singular *book* with plural *books*. Functional markedness concerns which of a group of grammatical categories is distinguished from the others. For example, within the English pronominal system, nominative and genitive appear only in specialized contexts, while accusative is unmarked, being used for, amongst other things, direct objects, indirect objects, predicates (*It's me*), subjects of gerunds, and Jespersen's (1924) "nexus of deprecation" (*Me dance?*).

There is frequent coincidence between formal and functional markedness. The third person is a well known instance. Silverstein (1976 [1986]: 173) observes a number of pronominalization phenomena in which, although no person is intended, third person forms are used. He concludes that third person is functionally unmarked, whereas first and second are marked. Benveniste, on the other hand, in an often alluded to passage, observes that third person is often formally unmarked:

> Certain languages show that "third person" is indeed literally a "non-person". To take just one example among many, here is how the possessive pronominal prefixes are presented in two series (something like inalienable and alienable) in Yuma (California): first person *ʔ-*, *ʔan^y-*; second person, *m-*, *man^y-*; third person, zero, *n^y-*. The personal reference is a zero reference outside the *I/you* relationship.
>
> (Benveniste 1971: 221; last '-' added—DAH/DJA)

However, this is far from a perfect correlation, as the English present tense *-s* for third person singular attests.

Given the imperfect correlation between formal and functional markedness, there is debate about what the precise criterion of functional markedness consists of, and, indeed, whether there can be a single criterion of functional markedness, or whether, in fact, it is a cluster of notions (see Haspelmath 2006 for discussion).

There are a number of means of representing markedness. At the level of the φ-set, one can regard size of structure (whether a geometry or a feature bundle), as a metric of markedness. Additionally or alternatively, markedness can be attributed to features themselves, rather than to the feature structure. For instance, Harley and Ritter (2002) posit two number features and suppose that one feature is unmarked in the sense that, if a language uses only one feature in its grammar, it will be that feature. Furthermore, if features are bi- or multivalent (Harley and Ritter's are privative), then markedness can be attributed to feature values, additionally or alternatively to the concept of a feature's being marked itself.

In systems where the feature values are + and −, there is sometimes the assumption made that plus is the marked value and minus the unmarked. Silverstein (1976 [1986]) made an early attempt to maintain this position. Yet, his own analysis shows it to be empirically untenable in its simplest form (see Silverstein, p. 188, on "markedness polarity" and his footnote 9, pp. 227–8).

One way to capture context-dependent markedness is by directly encoding it as a feature's value (Chomsky and Halle 1968). So, a feature, [μF], would be specified as marked (m) or unmarked (u), with the eventual +/− value being determined by a rewrite rule which is sensitive to context:

(29) $m \rightarrow +$ in the context [__F] [μG]
$m \rightarrow -$ in the context [__F] [μH]
$u \rightarrow +$ in the context [__F] [μI]
$u \rightarrow -$ in the context [__F] [μJ]

Lakoff (1970) provides specific arguments, attributed to Postal, in this direction. See also Bierwisch (1967), and more recently Wiese (1999).

The limiting case of markedness is that of the default. Intuitively, if an element has multiple uses, it is relatively unmarked. Default items constitute the most extreme cases of multiplicity of use within a natural class of items. They are negatively defined, informally, as the form used where no other is appropriate. Following on from work by Kiparsky (1973), defaults, or "elsewhere" forms, have been formally accommodated within some theories (e.g., Distributed Morphology, Halle and Marantz 1993).

The markedness metrics above, namely size of structure and number of marked values, do not induce a complete ordering on all possible φ-sets: different φ-sets can contain the same number of features and/or marked values. For instance, if φ_1 is marked with respect to person and unmarked with respect to number, and φ_2, conversely, by whatever criterion of markedness, then neither exceeds the other in total markedness. One way past this impasse, if one takes total ordering with respect to markedness as a desideratum, is to claim that person and number, for example, are not equally marked, but rather that person is extrinsically more marked than number (in which case, φ_1 is more marked than φ_2).

There are some intriguing generalizations in this domain. Both number and gender distinctions are frequently lost with respect to person, but in opposite fashions. Simplifying Corbett (1991, 2000) slightly, if a language makes number distinctions only for some persons, then it will be only for first, or only for first and second (see Siewierska 2004 for some dissent); and if a language makes gender distinctions only for some persons, then it will be only for third, or only for second and third. In other words, in the domain of person, where one tends to find gender, number is rarer, and where one tends to find number, gender is rarer. As for number and gender themselves, Greenberg (1966) observes that no language has more gender distinctions in the plural than in the singular (e.g., German has masculine, feminine, neuter in the singular, but only a common gender in the plural). If we take singular to be the unmarked number, then Greenberg's discovery is that gender distinctions decrease where number markedness increases. This ties in conceptually with the person facts: where language is most likely to make number distinctions (in first, or first and second person), it is least likely to make gender distinctions.

Even if these generalizations do form a conceptually sound cluster, they are tendencies, not universals. A striking example is person/number neutralization in Kuman: person distinctions are lost for some numbers in the (subject) agreement system, but number distinctions are lost for some persons in the pronominal system (Foley 1986: 70, citing Piau 1985):

Kuman subject agreement

Person	Singular	Dual	Plural
1	*-i*	*-bugl*	*-mun*
2	*-n*	*-bit*	*-iw*
3	*-uw*	*-bit*	*-iw*

Kuman pronouns

Person	Singular	Plural
1	*na*	*no*
2	*ene*	*ene*
3	*ye*	*ye*

Observe that the pattern of subject agreement left, is reminiscent of Greenberg's generalization concerning gender: fewer person distinctions in the non-singular than in the singular (see Cysouw 2003 for other such cases).

Despite the inherent interest of such generalizations, it must be admitted that their precise formulation and how, or whether, they should be captured by a theory of markedness currently evades us.

1.6 Themes in Phi Theory

Our focus so far has been on the history of φ-features in the three domains of grammar where they are of primary relevance: syntax, semantics and morphology. However, if this volume is to fulfill its aim of motivating a transmodular Phi Theory, then we require a characterization of the research questions that transcends and unites different modules. Above, we have, of course, noted several places where research themes from different domains of the grammar have converged (the end of Section 1.3 touches on this for syntax and semantics, and the end of Section 1.4 for semantics and morphology, and syntax and morphology). To conclude, we now tie together the emergent issues in Phi Theory in a way that, we hope, will excite further interest whilst serving to emphasize areas where research into modules can be mutually informative, insightful, and stimulating.

Questions of science often reduce to three broad issues: substance, structure, and interaction. In Phi Theory, these lead to the following broad themes.

Substance What are the different categories of φ-features? Above, we addressed primarily person and number, and secondarily gender (reflecting the foci of the papers in this volume). However, recall that, in syntax, φ-features were simply those that were affected by agreement transformations. Corbett (2006: 133–41) draws attention to a number of other categories that are agreement-like in their behavior: case, definiteness, honorificity, and even, in some languages, some tense/mood/aspect categories (on this last, see especially, Nordlinger and Sadler 2004). Honorificity, in particular, has received recent attention (Boeckx and Niinuma 2004, Potts and Kawahara 2004, Bobaljik and Yatsushiro 2006).

Within each category, what is the inventory of features? That is, what is the inventory of person features, of number features, and so on, and are they universal? Can the same be maintained for gender and honorificity? It is important to emphasize that asking what the inventory of features is is not the same as asking what values of a category are. Consider, for instance, number. A possible value for this category is dual. However, we reviewed above a variety of morphological evidence that suggests that dual is not a primitive feature, but is featurally complex. Moreover, we showed how these number features can be naturally defined given semantic research in the domain of number, aspect, and Aktionsart. Are other familiar φ-categories likewise complex?

Structure Within a given φ-category, how are the features structured? Pursuing further the example of number, why can languages have a paucal only if they have a more basic distinction too (Corbett 2000); why can there not be a language with paucal∼non-paucal as its only number distinction? Like questions arise within person (see McGinnis, this volume). Do they arise also within gender? One avenue, mentioned above, is to adopt a geometry, or a filter system. These serve to constrain combinations of features, designating some semantically possible ones as geometrically illicit. However, are geometries and filters themselves submissible to analysis, and, if so, what explains them? Could more careful examination of the syntax or semantics of the features that compose these categories reduce geometries or filters to syntactically or semantically natural conditions?

Like questions arise inter- as well as intracategorially. There are a number of well known, if well disputed, correlations between person, number, and gender. For instance, if a language has two different verb forms which move to two different heights, then, if only one has person, that is the verb form that moves higher (Section 1.2.1). Or, no language makes more gender distinctions in the singular than in the non-singular (Section 1.5). Where such constraints concern cooccurrence restrictions, they can clearly be captured by a geometry or filter system. However, these raise again the questions just outlined: what is the origin of the geometry, can it be derived by syntactic or semantic means? The need for syntactic exploration is particularly pressing, given the impact that some of these generalizations have on the syntax (e.g., height of verb movement and clitic placement, or hierarchies and ergative splits). And, if geometric effects can be reduced to questions of syntactic structure, can these, in turn, be derived on semantic grounds?

Interaction The questions just outlined begin to touch on issues of interaction between modules: how do module-specific operations interact with the substance and structure of φ-features? On the semantic side, do geometric generalizations stem from demands of the semantic interface, or are they separately stipulated, syntactically or morphologically? How do φ-features interact with the different modes of semantic composition; for instance, do binding and predication treat φ-features on a par (Adger 2005, Kratzer 2006)? On the syntactic side, the core operations are Merge, Move, and Agree. How do φ-features trigger and constrain their application? Can one deduce the nature of feature organization from any such constraints? On the morphological side, do the operations that induce syncretism and allomorphy reveal any hierarchy of φ-features, either organizational or markedness-based?

Doubtless, this list of topics and questions is incomplete. However, at this early stage, where Phi Theory is merely emergent, not fully fledged, incompleteness is inevitable. If we are successful in stimulating research into the issues raised, then the future will reveal just how incomplete a picture we have painted. Hopefully, we are not too far off.

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2

Features on Bound Pronouns

IRENE HEIM

Are person, number, and gender features on bound-variable pronouns semantically interpreted, or are they just a superficial reflex of agreement between the pronoun and its antecedent? Some have argued that at least some pronouns have the semantics of featureless, unrestricted, variables. Others have pointed out good predictions from the assumption that features on bound pronouns restrict the range of the relevant variable. It has also been suggested in recent work that simple deletion or copying rules such as those proposed in the literature do not quite succeed in predicting the distribution of features on bound pronouns. I will review the case for uninterpreted features and explore some of the challenges involved in improving on existing accounts. Data about plural pronouns with split antecedents will play an important role.

2.1 Phi-features as presupposition triggers

Before we debate whether features on bound pronouns are semantically interpreted, we must agree on how they would be interpreted if they were. Uncontroversially, *some* occurrences of pronoun features are interpreted, notably those on deictic pronouns. Let us make precise what their interpretation in these uncontroversial cases is, so we know what the facts would be like if features on bound pronouns were interpreted likewise.

2.1.1 *Features on deictic pronouns*

The features we are concerned with are the so-called "φ-features": person, number, and gender. Semanticists that have attended to them have generally given them a presuppositional semantics, as pioneered by Cooper (1983) for English gender. In the implementation of Heim and Kratzer (1998), this looks as follows. In the syntax (LF), each pronoun has a numerical index. Indices are variables and mapped to semantic values by an assignment. For free pronouns, the relevant assignment is given by the utterance context and represents the speaker's referential intentions. When φ-features are disregarded, the index is the only semantically interpreted part of the pronoun, and the pronoun is simply a variable, as reflected in rules like (1).

(1) If β is a pronoun and i an index, then for any assignment g, $[\![\beta_i]\!]^g = g(i)$ (or undefined, if i is not in the domain of g).

If one or more φ-features are present, these are adjoined to the indexed node (in an arbitrary hierarchical order).

(2) [3rd [singular [masculine [he_7]]]]

Each feature denotes a partial identity function of type $\langle e,e \rangle$. For gender, these are:

(3) $[\![\textbf{masculine}]\!] = \lambda x_e$: x is male. x
$[\![\textbf{feminine}]\!] = \lambda x_e$: x is female. x

The constituent consisting of the feature and its complement is interpreted by Functional Application. It denotes an individual only if the denotation of the complement happens to have the relevant property (maleness or femaleness). When it does denote, it denotes the same individual. The partiality of the interpretation function is inherited up the tree and ultimately induces truth-value gaps for the containing sentence. In a simplified example (omitting person and number), we compute the following result.

(4) For any g: $[\![\textbf{MASC-he}_7 \textbf{ is married}]\!]^g$ is defined if $7 \in \text{dom}(g)$ and g(7) is male.
Where defined, $[\![\textbf{MASC-he}_7 \textbf{ is married}]\!]^g = 1$ if g(7) is married, and $= 0$ otherwise.

If we are dealing with an unembedded occurrence of this sentence, uttered by a speaker who intends the 7th variable to refer to John, this means that the speaker is presupposing John to be male and asserting him to be married.

This is Cooper's treatment of gender features, and it can be extended straightforwardly to person and number[1] (notwithstanding the prevailing tradition in philosophy to analyze first person pronouns as indexicals rather than variables). We can treat all pronouns, regardless of person and number, as variables, hence subscripted by a numerical index and interpreted by rule (1). The various features attached to this index all denote partial identity functions. For number features, we need an ontology that has pluralities as well as simple objects among its individuals and supports appropriate notions

[1] See, e.g., Dowty and Jacobson (1989), Schlenker (2002), Sauerland (2003).

of atomicity and inclusion. Person features happen to be indexicals,[2] that is, they denote functions defined with reference to an utterance context that determines participant roles such as speaker and addressee.[3] I use "s_c", "h_c" as abbreviations for "the speaker (addressee) of c."

(5) number: $[\![\textbf{singular}]\!] = \lambda x_e$: x is an atom. x
$[\![\textbf{plural}]\!] = \lambda x_e$: x is a plurality. x

person: $[\![\textbf{1st}]\!]^c = \lambda x_e$: x includes s_c. x
$[\![\textbf{2nd}]\!]^c = \lambda x_e$: x includes h_c and excludes s_c. x
$[\![\textbf{3rd}]\!]^c = \lambda x_e$: x excludes s_c and h_c. x

For a first person singular pronoun, we compute the following presupposition and assertion.

(6) LF: **$\mathbf{I_7}$ am married**, spoken in a context c,
asserts that $g_c(7)$ is married, and
presupposes that $g_c(7)$ is an atom including s_c.

Given the background ontology, an atom that includes the speaker can only be the speaker himself. So if the speaker of (6) manifestly intends to refer with *I* to himself, the presupposition in (6) is (trivially) true. If he manifestly intended to refer to someone else, it would be obviously false. Since it is impossible to presuppose an obvious falsehood, this cannot happen. Thus *I* always refers to the speaker, despite being technically a variable.

2.1.2 *Features on bound-variable pronouns*

We have seen how φ-features on deictic pronouns, via their presuppositions, constrain the range of possible referents. Turning now to anaphoric, and specifically bound-variable, pronouns, it is not immediately obvious that the role of φ-features is the same. Reference, after all, is beside the point here, and the most salient job that φ-features appear to be performing is to constrain the range of possible *antecedents*. This is reflected in the grammaticality contrasts we obtain by varying φ-features of an obligatorily anaphoric pronoun such as the English *self*-reflexive.

(7) Mary invited herself/*himself/*myself/*themselves.

From a theoretical point of view, it would be disappointing to have different analyses of the same features depending on whether they are on deictic or anaphoric pronouns. And as we are about to see, there is good reason to

2 Notice that this is not the same thing as treating the pronoun itself as an indexical.
3 See, e.g., Zwicky (1977) and Noyer (1992) for analyses of the morphosemantics of person.

believe that this undesirable maneuver is also unnecessary. The antecedent-constraining role of φ-features on anaphoric pronouns will be seen as a side-effect of their basic reference-constraining semantics.[4]

The LF of one of the ungrammatical versions of (7) must display the co-indexing in (8) to satisfy Binding Theory.

(8) Mary 5[t_5 invited $MASC_5$]

What happens in the semantics? We first derive that the open sentence t_5 *invited* $MASC_5$ denotes a truth value only under those assignments that map 5 to a male. Next we apply Predicate Abstraction, which in a system with truth-value gaps is naturally formulated as follows.[5]

(9) $[\![\mathbf{i}\ \alpha]\!]^g = \lambda x_e \colon \alpha \in \text{dom}([\![\ ]\!]^{gx/i}).\ [\![\alpha]\!]^{gx/i}$

The predicate 5[t_5 *invited masc*$_5$] in (8) then denotes the partial function whose domain is males and which maps those who invited themselves to 1 and the others to 0 (in symbols, [λx_e: x is male. x invited x]). In the final step, we apply this function to Mary, which is only possible if Mary is male. So we predict that (8) presupposes that Mary is male. The asterisk in (7) reflects the judgment that "Mary invited himself" is deviant under normal assumptions, namely when (the relevant) Mary is assumed to be a female. To the extent that the possibility of "Mary" naming a man is considered, the deviance judgment is qualified—as we predict.

We saw already in this simple example that when we apply our presuppositional treatment of φ-features to bound-variable pronouns, we must complement it with a suitable theory of "presupposition projection". In our setting, this amounts to formulating composition rules and lexical entries so they handle partiality in their inputs and pass it up appropriately to their outputs. Specifically, we need the formulation of Predicate Abstraction in (9), and—as we will see next—the right lexical entries for quantifying determiners. Consider a quantified variant of (7).

(10) a. *Every girl invited himself.

b. LF: every girl 5[t_5 invited $masc_5$]

To interpret this, we must know how the generalized quantifier **every girl** applies to the partial function denoted by its sister. An appropriate entry is (11), predicting for (10a) the presupposition that every girl is male.

[4] This is the main point of Cooper's chapter on "Gender agreement" (ch. 7 of Cooper 1983). Dowty & Jacobson (1989) push Cooper's approach further by considering number and person and by applying it also to the agreement between subjects and verbs.

[5] See Heim and Kratzer (1998), where this formulation is motivated by examples of definite descriptions inside relative clauses.

(11) $[\![\textbf{every}]\!] = \lambda f_{\langle e,t\rangle}.\ \lambda g_{\langle e,t\rangle}: \{x: f(x) = 1\} \subseteq dom(g).\ \{x: f(x) = 1\} \subseteq \{x: g(x) = 1\}$

Again, this corresponds to the relevant judgment about (10): a deviant utterance under normal assumptions about the world.

A consequence of this approach (highlighted by Cooper) is that common nouns need not be marked for gender. For example, the explanation just given for the deviance of (10) did not rely on the assumption that the noun *girl* was feminine—only on the assumption that girls are female.[6] This helps account for nouns that can antecede pronouns of either gender. Both (12) and (13) are non-deviant, but one is appropriate if the class is all male and the other if it is all female.

(12) Every student in my class voted for himself.

(13) Every student in my class voted for herself.

We derive this from the assumptions we used in the analysis of (10). Example (12) presupposes that every student in my class is male, and (13) that every one is female.

Cooper's way of capturing gender mismatches between a bound pronoun and its binder as presupposition failures can also be applied to person and number mismatches. We derive impossible presuppositions also for (14) and (15).

(14) *Every girl voted for themselves.
LF: every girl 5[t_5 voted for 3rd-pl_5]
predicted presupposition: "every girl is a plurality"

(15) *Every girl voted for myself.
LF: every girl 5[t_5 voted for 1st-sg_5]
predicted presupposition: "every girl is identical to s_c"[7]

A worry may arise of how the account applies to the non-quantified version of (15), which is no better.

(16) *Mary invited myself.
LF: Mary 5[t_5 invited sg-$1st_5$]
predicted presupposition: "Mary = s_c"

[6] On extending this analysis to non-natural gender, see Cooper (1983), Dowty and Jacobson (1989), Pollard and Sag (1994).

[7] I take it that the domain of *every* cannot be a singleton, as a matter of a presupposition or other felicity condition imposed by *every*. Given this, the predicted presupposition is impossible.

This presupposition is not impossible, since (16) might be spoken by Mary herself. I suggest that it is deviant for an independent reason, a general prohibition against referring to oneself by one's name.[8]

2.1.3 *Features on "split bound" plural pronouns*

Schlenker (2002) points out that the presuppositional analysis of φ-features also applies successfully to cases of plural pronouns with so-called split antecedents. Non-deictic plural pronouns sometimes seem to get their reference from two or more separate antecedents at once. For example, *they* in (17) may mean *John and Mary*.

(17) John told Mary that they should get together.

This particular example may not be interesting, since the pronoun can be analyzed as referential. Variations on it, however, have quantifiers in place of one or both of the antecedents, and there the plural pronoun can be neither a free nor a bound variable.

(18) Every boy told Mary that they should get together.

Example (18) can mean that each boy x told Mary that x and Mary should get together. If *they* were a free variable, it would have to pick out a fixed plurality not dependent on x, and if it were a bound variable, it would be coindexed with the trace of one of the higher DPs. Neither way could its value vary with, yet be different from, the value of the variable bound by *every boy*. In order to capture the intended reading, we must represent this plural pronoun as a *coordination of two variables* (one bound by *every boy*, the other either free or bound by *Mary*).

(19) every boy 7[t_7 told Mary that 3rd-pl_{7+8} should get together]
where $g_c = [8 \rightarrow \text{Mary}]$

Previous authors who have drawn this conclusion have used notations such as $they_{7,8}$ or $they_{\{7,8\}}$, assuming the same semantics.

(20) If β is a pronoun and i, j are indices, then for any assignment g,
$[\![\beta_{i+j}]\!]^g = g(i) \oplus g(j)$ (the i-sum of g(i) and g(j)).

[8] This isn't the whole story. In certain registers one does refer to oneself by name, yet even in those, (16) is not allowed (though *Mary invited herself* is). A conceivable explanation invokes two assumptions: First, these special registers are languages in which there is no first person. (So (16) is just not a sentence.) Second, third person in those languages does not trigger any presupposition. (As we will note in Section 2.1.4 below, there is reason to assume that third person doesn't carry a semantic presupposition even in the standard language. Still, there is a difference: In the standard language, *third* competes with *first* and therefore gives rise to an implicated presupposition, whereas in the special register there is not even that.)

I call such readings of plural pronouns "split bound" readings.

Let's look at the pronoun's features now, in this case third person plural. As before, we represent the features as adjoined at the edge of the pronoun, so they here apply to the semantic value of the whole complex index. The presupposition that we generate for (19) then is (21).

(21) for every boy x, x $\oplus$ Mary is a plurality not including speaker or hearer

This is an obvious truth, at least in normal contexts for the use of this sentence, where the boys under discussion include neither Mary nor the speaker or hearer.[9] If we tried to substitute a singular feature for the plural feature in this LF, we would presuppose a necessary falsehood, and likewise if we substituted a first or second person feature. So we explain why the reading under consideration requires a plural third person pronoun.

Split-bound readings also occur in first (and second) person plural pronouns, as first pointed out by Partee (1989) and discussed further by Schlenker (2002) and Rullmann (2004). One of Rullmann's examples is (22), with our analysis of its intended reading.

(22) Every woman I date wants us to get married.
LF: every woman 2[1st-sg$_3$ date t$_2$] 4[t$_4$ wants 1st-pl$_{3+4}$ to get married]
$g_c = [3 \rightarrow \text{speaker}_c]$
predicted assertion: for every woman x, x wants x $\oplus$ s_c to get married
predicted presupposition: for every woman x, x $\oplus$ s_c is a plurality including s_c

The predicted presupposition again is an obvious truth, and we can see that no other choice of number or person feature would have yielded coherent presuppositions.

2.1.4 *Refinement: semantic presuppositions and implicated presuppositions*

The astute reader may have noticed some predictions that aren't quite right, specifically with regard to bound variable pronouns in the third person. Consider (23).

(23) Every girl invited herself.
LF: every girl 5[t$_5$ invited 3rd-sg-fem$_5$]

With our entry for the third person feature and our assumptions about presupposition projection, we predict that this sentence can only be used to talk about a set of girls that does not include the speaker or hearer. This seems too

[9] I get back to this caveat shortly.

restrictive. It is not impossible that (23) might be uttered by, or addressed to, a member of the same set of the girls that are being talked about. A continuation like "including me (and you)" does not sound infelicitous.

The problem is real, but admits of a solution entirely compatible with the general approach under consideration. The solution is Sauerland's distinction between semantic presuppositions and implicated presuppositions. Sauerland (2003, this volume) proposes that *3rd* does not have the entry in (5), but rather denotes the unrestricted identity function (i.e., it triggers no semantic presupposition). However, there is a principle "Maximize Presupposition" which says that a speaker must always choose the person feature with the strongest presupposition he can felicitously make. So a speaker must not use he_i to refer to himself, since he could use I_i instead and thereby express the presupposition that $g_c(i)$ includes s_c. Put differently, the choice of he_i over I_i gives rise to an "implicated presupposition" that $g_c(i)$ does not include s_c. Similarly, the choice of he_i over you_i implicates the presupposition that $g_c(i)$ does not include h_c. What was previously encoded as semantic presuppositions of the third-person feature are accounted for as implicated presuppositions.

In many cases, this reanalysis does not make any difference in empirical predictions, but it does when it comes to third person *bound* pronouns like that in (23).[10] In this case, the implicated presupposition is substantially weaker than the semantic presupposition we predicted originally. By not using a first or second person pronoun instead of *herself* in (23), the speaker merely implicates that she cannot presuppose that every girl includes s_c or that every girl includes h_c. This does not rule out that one of the girls is the speaker or the hearer, and thus it brings our predictions closer to the intuitive facts. The same amendment applies to the analysis of our split-bound example (18). We no longer predict a semantic presupposition that for no boy x does x $\oplus$ Mary include the speaker or hearer, but a weaker implicated presupposition that neither s_c nor h_c is part of x $\oplus$ Mary for *every* boy x. This is compatible with the boys including the speaker or hearer or both, it just doesn't allow that there's just one boy and he is s_c or h_c.

A closer look at split-bound examples brings up another questionable prediction of our initial analysis, this one concerning not person but number. Change (18)/(19) slightly to replace "Mary" by "John", a name that might refer to one of the boys. The predicted presupposition then is that x $\oplus$ John is a plurality for every boy x, that is, that John is not one of the (relevant) boys. But this should not really be part of the meaning. It's not impossible for John

[10] Sauerland (2003) explicitly exempts bound variable pronouns from his discussion (for reasons that we will get to). His arguments in support of his proposal are independent of my use of it here.

to tell himself "we should get together". Again, a reanalysis of the presupposition as implicated rather than semantic—also argued for on independent grounds by Sauerland—is helpful. If plural triggers no non-trivial semantic presupposition, but competes with singular under Maximize Presupposition, we derive an implicated presupposition that is suitably weaker: not for every boy x is x $\oplus$ John an atom. This allows John to be among the boys, as long as he's not the only one.[11]

So we want to revise our initial claims about the presuppositional semantics of the φ-features along the lines of Sauerland's theory. This does not threaten the larger project of giving a unified analysis of φ-features on free and bound pronouns. In fact, everything we have seen so far suggests that this project is fundamentally on the right track and provides an appealing explanation of why bound-variable pronouns have to agree in features with their antecedents. But there is more to come.

2.2 Bound-variable pronouns with uninterpreted features

2.2.1 *Bound first person singular pronouns*

Can a first person singular pronoun such as *I*, *me*, *myself* ever be a bound-variable pronoun? Our story so far predicts it can, but we could not possibly distinguish such a reading from a referential one. Given that all pronouns are variables, we can generate LFs in which a first person singular pronoun is a bound variable. Yet its features will ensure that this variable can take on only one value (s_c). As a result, a bound first person singular pronoun can't ever have a truly quantificational antecedent (like a universal or existential quantifier with a non-singleton restrictor), because then there would be the presupposition—impossible for a non-singleton—that each element of the restrictor is identical to s_c.

Some have implied that *I* indeed never acts as a bound variable, so this may look like a good prediction. However, a number of authors, starting with Partee (1989), have pointed to facts that contradict it. A common example is (24), where the relevant pronoun is *my*.[12]

(24) Only I did my homework.

[11] We still correctly rule out *Every girl voted for themselves*, since here even the weaker implicated presupposition ("not every girl is an atom") is incoherent.

[12] Partee's original example is (i).

(i) I'm the only one around here who will admit that I could be wrong.

This example raises special issues which unfortunately are beyond the scope of the present paper. I will only mention two observations that set (i) apart from (24) in the text and the other examples I will treat here: First, the relevant "sloppy" reading in (i) is possible with either first person or third person morphology (whereas in (24), the reading completely disappears if we change *my* to *his* or *her*; see

This can be taken to deny that people other than me did their own homework, that is, to mean "for every $x \neq$ me, x didn't do x's homework." Obviously this reading is not obtained if *my* is construed as a free pronoun. But (less obviously) it is also not obtained, on our assumptions, if *my* is bound. Binding *my* will give us an LF such as (25).[13]

(25) [only $1st\text{-}sg_1$] $2[t_2$ did $1st\text{-}sg_2$'s homework]

Given how the presuppositions triggered by *my* project, the predicate abstract $2[t_2$ did $1st\text{-}sg_2$'s homework] comes to denote the partial function [λx: $x = s_c$. x did x's homework]. This has a singleton domain and cannot be applied to anyone other than s_c. We have not specified an explicit semantics for *only* that negotiates partiality in its arguments, but it is easy to see that no possible entry could work here. Suppose the speaker and John are the only relevant people. Then if s_c did s_c's homework and John didn't do John's, (24) is judged true, whereas if s_c did s_c's and John did John's, it's judged false. But the predicate abstract's denotation is the same in either scenario (the singleton $\{\langle s_c,1\rangle\}$). There is no compositional way to get different truth values for the sentence, however we define *only*.

What this example has been taken to show is that φ-features on bound-variable pronouns are not, or not always, interpreted. Perhaps the semantics can somehow ignore them, or the syntax operates in such a way that they are not even there at LF. (We will get into more detail on this.) It is plain how such an assumption helps. If the LF can be (26) instead of (25), the predicate abstract will denote an unrestricted function, and an obvious entry for *only* such as (27) will deliver correct truth conditions. (Empty-set symbols represent pronouns without φ-features.)

(26) [only $1st\text{-}sg_1$] $2[t_2$ did $\varnothing_2$'s homework]

(27) $[\![\text{only}]\!] = \lambda x_e.\ \lambda f_{\langle e,t\rangle}.\ \{y: f(y) = 1\} = \{x\}$

There is a second problem for us here. The first problem, we just saw, is that (24) has a reading which we predict it cannot have. The flip-side problem is that the following variant of the sentence does not have this reading. Yet (as we will see) we do not rule it out.

(28) Only I did his homework.
cannot mean: "I did my homework, and no-one else did theirs."

below). Second, the sloppy reading in (i) seems to be more narrowly confined to English than that of examples like (24).

[13] This discussion assumes that *only I* is a constituent and the meaning of *only* maps an individual to a generalized quantifier. It is worth noting, however, that we would arrive at essentially the same conclusion if we assumed an analysis of *only* as an essentially proposition-level operator that associates with focus.

Assume that the relevant individuals are again the speaker and John, and both are male. Then consider this potential LF.

(29) [only 1st-sg_1] 2[t_2 did 3rd-sg-$masc_2$'s homework]

Given the Sauerland treatment of third person, the predicate abstract in (29) denotes a function that is not restricted to non-speakers. It is restricted to atoms and (presumably) to males,[14] but that doesn't exclude either one of the alternatives that *only* quantifies over. There is no obvious way to block this LF as semantically deviant. We don't want to renege on Sauerland's analysis, because then we would be back to predicting that *Every student did his homework* can't talk about a domain that includes the speaker. In fact, the comparison between this example and (28) highlights our dilemma. An even closer minimal pair is (28) and *No student but me did his homework*. In a given context, the students that are relevant for the interpretation of *every student* or *no student but me* and the alternatives that are relevant for the interpretation of *only I* might be exactly the same set (some set of students that includes the male speaker along with other male students). Yet, a third person pronoun can be a variable ranging over this set in the sentences with *every* or *no*, but not in the sentence with *only*.

So we have an undergeneration problem with the grammatical sloppy reading in (24), and an overgeneration problem with an ungrammatical bound reading for (28).

2.2.2 *The broader phenomenon*

In discussing (24), we did not consider the features first person and singular separately, nor have we looked so far at other features. By suitable variations on the example sentence and on the scenarios, we can convince ourselves that the problem is quite general: all φ-features, or at least all those with non-trivial semantic presuppositions, can sometimes be left uninterpreted when they appear on a pronoun bound by an *only*-DP. Moreover, the same phenomenon is observed when the exclusive particle *only* is replaced by a scalar or additive particle like *even* and *also* (here we consider the presuppositions that these items trigger rather than the assertion). The phenomenon replicates itself also in the distribution of sloppy readings under ellipsis.

(30) Johnny did his homework, but I didn't ~~do my homework~~.

[14] I have not gone into the question of whether the presupposition of the masculine feature might also be a mere implicated presupposition rather than a semantic presupposition. The problem under consideration can only get worse if this is the case.

A different class of examples in which the morphology of a bound pronoun is at odds with its semantics involves distributive quantification by means of a plural quantificational DP, a floated quantifier, or an implicit distributor.[15]

(31) All candidates think they will win.

(32) These candidates all/each/both/Ø think they are better than all their competitors.

(33) They each believe they are the only person in the room.[16]

The point about these is that the bound-variable pronoun *they* or *their*, despite its plural morphology, must range over atomic individuals. For example, (33) is true if every atom in the plurality denoted by the matrix subject is in the set {x: x thinks x is the only person in the room}. It is not necessary for the truth of (33) that any plurality be in this set, that is, that any plurality think that that plurality is the only person in the room. This indicates that we don't want an interpretation of the bound pronoun *they* that forces its values to be non-atoms.

On our initial interpretation of plural, with a semantic presupposition of non-atomicity, this immediately implies that we can't have an LF like (34) with an interpreted plural feature, since it would presuppose that each atom in $g_c(2)$ is a non-atom.

(34) 3rd-pl_2 each 4[t_4 think 3rd-pl_4 are the only person in the room]

If instead we assume Sauerland's interpretation, (34) may seem unproblematic at first, because the plural feature will not restrict the variable to non-atoms and will create no offending semantic presupposition. But the problem returns on the level of implicated presuppositions. The implicated presupposition of (34) is that, for all the speaker knows, not every atom in $g_c(2)$ is an atom, and this is also incoherent. We conclude that the LF for (33) must not have a plural feature on the bound pronoun, whether plural triggers semantic or merely implicated presuppositions. Rather, we need an LF with a featureless, or at least numberless, pronoun such as (35).[17]

(35) 3rd-pl_2 each 4[t_4 think $(3rd)_4$ are the only person in the room]

And it is not just the number feature that's semantically inert in pronouns bound by floated quantifiers. As Rullmann (2004) notes, person is affected

[15] See e.g. von Stechow (2003), Rullmann (2003).

[16] From Sauerland (2003).

[17] This is also Sauerland's own conclusion about his example, and his reason for exempting bound-variable pronouns generally from his discussion.

too.[18] Suppose that (36) is uttered by one of the losers after a presidential election, and by "we" he means himself and the other candidates.

(36) We each thought we would win.

The intended meaning is that each candidate expected himself to win. This requires a bound construal of the second *we*. If there were an active first person feature on this bound variable, as in (37), it would generate the presupposition that each candidate includes the speaker.

(37) 1st-pl$_2$ each 4[t$_4$ think 1st$_4$ would win]

And once again there is also a flip-side to the undergeneration problem. Can we correctly predict that the relevant bound readings do *not* show up with any other choice of pronoun? Can we rule out LFs like the following?

(38) They each thought that he is the only person in the room.
LF: *3rd-pl$_2$ each 4[t$_4$ think 3rd-sg-masc$_4$ is the only person in the room]

(39) We each thought she would win.
LF: *1st-pl$_2$ each 4[t$_4$ thought 3rd-sg-fem$_4$ would win]

Both of these receive perfectly reasonable semantic presuppositions on Sauerland's account. And (39) still does even if we revert to the original, stronger semantics of third person. There are no implicated presuppositions on which deviance might be blamed either. Our current theory makes doubly wrong predictions: a floated *each* (or other plural distributive quantifier) not only shouldn't be able to bind a plural pronoun, but it should be able to bind a singular pronoun.[19]

2.3 A syntactic account of uninterpreted features

2.3.1 *Feature Transmission*

A standard response to the data just surveyed is to allow syntactic derivations in which φ-features on a bound pronoun may be present on the surface but

[18] For gender, the issue does not arise in this case, since the pronouns bound by these types of quantifiers are always plural and English (or German) does not have gendered plural pronouns. I have not investigated the issue in languages which do.

[19] Safir (2004) points to this problem also: "…the optimal bound variable sentence would presumably be *They all think he is smart*, because the bound reading is semantically singular, but this does not even have a bound reading." But I disagree with Safir's implication that this problem is specifically created by the syntactic approach to uninterpreted features (a version of which I will lay out below). To the contrary, it is a puzzle that arises whenever the semantics of distributive quantification is brought together with a semantic account of the features of bound pronouns. The only solution I know of that does not appeal to a syntactic agreement mechanism is that of Rullmann (2003), but even that does not help with explaining uninterpreted *person* features as in (36).

absent at LF. Kratzer (1998), Schlenker (1999, 2002), and von Stechow (2003) offer various implementations of this idea.[20] For example, Kratzer proposes that pronouns may be base-generated with empty (or perhaps incomplete) sets of φ-features, and that they then stay this way in the course of the derivation to LF. The idea—not unnatural given our presuppositional semantics for φ-features—is that there is no real need from interpretability for the presence of φ-features. Rather, features are essentially a morphological requirement. Sometimes it may be inapplicable, for example when the pronoun is in an elided structure, and in that case the pronoun may remain featureless throughout the derivation.[21] But underlyingly underspecified pronouns also occur in structures that aren't elided, and for these to be able to meet the morphological requirement, there must be a special mechanism. Let us say this is a rule like the following.

(40) FEATURE TRANSMISSION UNDER VARIABLE BINDING
In the derivation of PF, features of a DP may be copied onto variables that it binds.

(This rule presupposes a suitable definition of "binding", such as the one in Heim and Kratzer 1998: 263.) The overall effect is that only base-generated features (those present prior to transmission) will be interpreted in the semantics, and that any uninterpreted features showing up on the surface will be copies of matching features on a binder. If an underspecified pronoun is generated in an environment where Feature Transmission doesn't apply, the structure is filtered out at PF. It follows that all free pronouns must have underlying, hence semantically active, features.

There are further auxiliary assumptions required to make the Feature Transmission rule apply as intended. Specifically, we need mechanisms to generate appropriate features on the DPs that act as binders and hence as transmission licensers. To handle the cases that motivated the rule in the first place, we must assume that DPs of the form [*only* DP], [DP *each*][22] inherit the features of the DPs within them, and that DPs with certain determiners such as *all* are marked as plural. This also happens in the PF-derivation (since φ-features on DPs not of semantic type e are not interpretable and have no business being there at LF). We may or may not want to assume that a larger

[20] A related proposal is found in Pollard and Sag (1994), where features are treated as attributes of indices and hence necessarily shared under coindexing.

[21] This is an appealing analysis (in fact, the one favored by Schlenker 2002 and Safir 2004) of examples like (30).

[22] This is assuming a Sportiche-style syntax for Q-Float (Sportiche 1988). If floated quantifiers are adverbial, we need some modification to the definition of binding and/or the conventions of feature percolation.

set of complex DPs, perhaps all DPs, get specified for φ-features (in which case we have to say more about how these are generated), but for the time being, this isn't necessary.

Here are two illustrations of how underspecification of pronouns and Feature Transmission apply to the relevant examples.[23]

(41) Only I did my homework.
base-generated: [only 1st-sg$_5$] did Ø$_4$'s homework
after movement of subject, at LF: [only 1st-sg$_5$] 4[t$_4$ did Ø$_4$'s homework]
after feature percolation: *1st-sg*-[only 1st-sg$_5$] 4[t$_4$ did Ø$_4$'s homework]
after Transmission, at PF: *1st-sg*-[only 1st-sg$_5$] 4[*1st-sg*$_4$ did *1st-sg*$_4$'s homework]

(42) You each thought you'd win.[24]
base: [2nd-pl$_5$ each] thought Ø$_4$ would win
LF: 2nd-pl$_5$ 6[[t$_6$ each] 4[t$_4$ thought Ø$_4$ would win]]
Transmission: 2nd-pl$_5$ 6[[*2nd-pl*$_6$ each] 4[t$_4$ thought Ø$_4$ would win]]
percolation: 2nd-pl$_5$ 6[*2nd-pl*-[*2nd-pl*$_6$ each] 4[t$_4$ thought Ø$_4$ would win]]
Transmission again: PF:
2nd-pl$_5$ 6[*2nd-pl*-[*2nd-pl*$_6$ each] 4[*2nd-pl*$_4$ thought *2nd-pl*$_4$ would win]]

As already argued, the LFs that Feature Transmission helps us pair with the sentences here are adequate to express the observed bound readings. If derivations with underlyingly underspecified pronouns are never forced, we also generate alternative LFs in which the pronouns are bound yet do have their features interpreted. This is not a problem if the resulting interpretations are deviant in a way that filters them out. One way of ensuring this is to interpret *only* and *each* as projecting universal presuppositions about all the members of their domains.

2.3.2 *Feature Transmission and the problem of overgeneration*

The introduction of underlyingly underspecified pronouns and the Feature Transmission rule served to account for the bound readings of first- and second-person pronouns and of certain plural pronouns that our original

[23] I am assuming that Transmission also is responsible for φ-features on traces (which we don't hear directly, but have indirect evidence for from verbal agreement). We don't want to assume that features on traces arise automatically as a by-product of movement. If there was a first person feature on the trace of *only I* in the LF of (24), this would give rise to the same undesirable presupposition as an interpreted first person feature on the overt bound pronoun.

[24] This is a derivation à la Sportiche (1988): the floated quantifier is stranded by the subject that moves out of it.

theory was unable to generate. It is transparently a device to generate more LFs than we previously could, and thus to correct a problem of undergeneration. As we have noted, however, our initial theory also suffered from overgeneration. There was no obvious explanation of why we do not find bound readings in (43) or (44).

(43) Only I did her homework.

(44) They each thought he had won.

Is the new theory any better off with respect to this problem? Not right off. We still always have the option of base-generating all the features that show up at PF, so there is still nothing that prevents the problematic LFs (in which the pronouns are bound and their features all interpreted). These examples suggest, then, that we need to eliminate this option. We can do this by making Feature Transmission obligatory and unconditional. It is not, after all, driven by a mere morphological need for featural completeness; rather whenever there is binding, the binder's φ-features must all be copied onto all its bindees, regardless of whether these are underspecified. If a bindee already has its own features, the result of Transmission may then be a contradictory specification, e.g., *1st-3rd* or *sg-pl*. This, we take it, will be filtered out as unrealizable at PF. For (43) and (44), this leaves no way to generate a bound reading. More generally, a bound pronoun can never disagree in any feature with its binder. If it is not underlyingly unspecified, then at best it can have inherent features which happen to match the binder's or for which the binder is unspecified.[25]

Are there other solutions? It may be appropriate to remember at this point that the problem with (43) arises only under Sauerland's weak semantics of the third person. If third person semantically presupposed "excludes the speaker," the bound construal of (43) would have a contradictory presupposition. But this potential solution for (43) does not generalize to (44). There we had difficulty ruling out a singular bound pronoun even with our non-trivial presupposition for singular. I conclude that the overgeneration problem has to be solved in the way indicated, and I reformulate (40).

(45) Feature Transmission under Variable Binding (final version)
In the derivation of PF, all features of a DP must be copied onto all variables that it binds.

[25] Exercising this latter option allows us to maintain Cooper's account of gender: if quantificational DPs such as *every boy*, *every student* are not specified for gender, then nothing stands in the way of them binding pronouns with underlyingly specified, hence semantically interpreted, gender.

2.3.3 *Feature Transmission and split-bound pronouns*

Rullmann (2004) was the first to discuss uninterpreted features and split binding in the same context, and he concluded that it was difficult to fit the two phenomena into a coherent and principled account. Let us analyze his problem cases. I quote:[26]

Imagine John is in one room with all of his ex-wives, and he says to them:

[46] Even in the middle of the divorce proceedings, you each pretended that we were a happy couple.

[...] this sentence has a reading in which *we* ranges over pairs of individuals consisting of the speaker and one of his ex-wives.

A suitable LF and contextual assignment for this reading is (47).[27]

(47) $[\text{2nd-pl}_1 \text{ each}]\ 2[\text{t}_2 \text{ pretended } (\text{1st})\text{-}(\text{pl})_{2+3} \text{ were a happy couple}]$
$g_c(3) = s_c$ (= John); $g_c(1)$ = the ex-wives of s_c

I parenthesize the features on the split-bound pronoun to indicate that the LF expresses the intended reading with or without them. (They add only trivial presuppositions: for each ex-wife x, $x \oplus s_c$ is a plurality and includes s_c.) We don't have a problem with this example—as long as our syntax can generate at least one of the versions of this LF.

It is not so obvious, however, that it can. When Feature Transmission was merely optional, we certainly could just have base-generated both *1st* and *pl* and done nothing at PF. Now with Transmission obligatory, however, we must ask what that means for the case at hand. This brings to light a vagueness. In a case of split binding, what exactly are the variables that each binder binds, and what would it look like to copy features onto them? Before we consider this in more detail, let us broaden our data base. Rullmann follows up on (46) with another example:[28]

To add yet another twist, suppose again that John is in one room with all his ex-wives, but this time it is one of them who speaks to John, uttering:

[48] ?For your sake, we each pretended that we were a happy couple.

The intended reading here is one in which the first *we* refers to the ex-wives, but the second *we* is a variable ranging over pairs consisting of one of the ex-wives

[26] Rullmann (2004: 166).

[27] In this LF, the subject has been reconstructed into the position from which it moved to strand the floated *each*.

[28] Rullmann (2004: 166, n. 7).

plus the addressee ("each of us pretended that she and you were a happy couple").[29]

An LF for this reading should look as follows.

(49) [1st-pl$_1$ each] 2[t$_2$ pretended (pl)$_{2+3}$ were a happy couple]
$g_c(3) = h_c$ (= John); $g_c(1)$ = the ex-wives of h_c (which include s_c and others)

Consider also a similar example that involves *only* rather than floated *each*. Suppose one of the ex-wives says to John:

(50) All of us wanted to separate on peaceful terms, but only I wanted us to stay close after the divorce.

The intended reading of the second clause is "I wanted myself and you to stay close, and no other ex-wife wanted herself and you to stay close".

In all three of these examples, the split-bound pronoun surfaces as first person (*we*). But in (46), the *1st* feature cannot possibly have arisen by Transmission (since the binder is 2nd person), whereas in (48) and (50) it can *only* have arisen by Transmission (since not every pair of an ex-wife and John includes the speaker and therefore a base-generated *1st* would yield false presuppositions). How do we make sense of this in the context of an obligatory Feature Transmission rule? (46) suggests that the binder's feature (here *2nd*) ends up not on the complex indexed 2 + 3 that is the whole pronoun, but goes only to the smaller unit 2 that is part of this. If the same holds for (48) and (50), the binder's *1st* is also transmitted just to the 2-half of the index. Evidently, then, we need to say something more about what determines the surface feature of the split-bound pronoun as a whole, and why it sometimes matches the feature transmitted to one of the component-indices and sometimes not. It won't do to make this simply depend on whether the complex happens to have been generated with a base-generated feature of its own. For example, we must take care to prevent derivations like (51) and (52), which pair the same meanings we observed in (46) and (50) with different sentences that do not in fact allow these readings.

(51) LF: [2nd-pl$_1$ each] 2[t$_2$ pretended $\emptyset_{2+3}$ were a happy couple]
$g_c(3) = s_c$ (= John); $g_c(1)$ = the ex-wives of s_c

after Transmission:
[2nd-pl$_1$ each] 2[t$_2$ pretended *2nd-pl*$_{[2:\mathit{2nd}\text{-}\mathit{pl}]+3}$ were a happy couple]
spelled out as: "You each pretended you were a happy couple."

[29] Rullmann comments that "This example is much harder to process than [(46)], probably because the intended reading requires each occurrence of *we* to be interpreted differently." My feeling is that (50) is a bit easier, but not all speakers I have talked to like it either.

(52) LF: [only 1st-sg_1] 2[t_2 wanted 3rd-pl_{2+3} to stay close]
$g(3) = h_c$ (= John); $g_c(1) = s_c$ (one of the ex-wives of h_c)
after Transmission:
[only 1st-sg_1] 2[t_2 wanted 3rd-$pl_{[2:\mathit{1st\text{-}sg}]+3}$ to stay close]
spelled out as: "Only I wanted them to stay close."

Here is a proposal that gets the facts right. It begins with distinguishing two separate processes. One is Feature Transmission, which only targets individual variables and therefore, in the case of split binding, only affects an embedded subpart of the pronoun. The second is an operation that computes features for a complex pronoun on the basis of the features of its parts. Insofar as it deals with person features, we can state this operation as follows:

(53) (i) If i or j is unspecified for person, then leave i+j unspecified.
(ii) Otherwise, if i or j is 1st person, then specify i+j as 1st person.
(iii) Otherwise, if i or j is 2nd person, then specify i+j as 2nd person.
(iv) Otherwise, specify i+j as 3rd person.

Let us set aside number for the moment (as well as gender, which we have been ignoring already) and illustrate how this works just for person. Here is a derivation for *Only I wanted us to stay close*, under the reading described above.

(54) LF: [only $1st_1$] 2[t_2 wanted $\varnothing_{[2:\varnothing]+[3:\mathit{2nd}]}$ to stay close]
$g_c(3) = h_c$ (= John); $g_c(1) = s_c$ (one of the ex-wives of h_c)
by Transmission: ..... $\varnothing_{[2:\mathit{1st}]+[3:\mathit{2nd}]}$
by operation (53): ..... $1st_{[2:\mathit{1st}]+[3:\mathit{2nd}]}$

Notice that we began this derivation with an underlying second-person specification for the second half of the split-bound pronoun. This is, of course, consistent with the intended reading (this variable refers to the addressee, and the presupposition triggered by *2nd* thus is unproblematic). But did we have to do it? Given (53), yes. Clause (53i) says that both parts of the doubly indexed pronoun must be specified for person before the whole pronoun can be specified for person. Since we continue to assume that spell-out requires specification by the end of the PF derivation, each variable will have to be specified either underlyingly or by Transmission. This particular variable is free, so a base-generated feature is its only option. And given the (semantic or implicated) presuppositions associated with each feature-value, *2nd* is the only choice consistent with the intended reading.

The reader can verify that the person features in Rullmann's examples (46) and (48) can be generated similarly (again, with appropriate underlying person features on the unbound halves of the pronouns). We can also see how the bad form–meaning pairs in (51) and (52) are ruled out: In (51), for example, we must specify the variable 3 for person if we want *any* person to surface on the pronoun. And since it refers to the speaker, it must be first person. Then the second clause of (53) applies and makes the whole pronoun *1st*.

As for number, we have two options which both make correct predictions. We can add a clause to (53) that says to always specify i+j as plural. Or we can assume that number isn't specified by this operation at all. In that case, all pronouns with complex indices better bring to PF an underlying number specification. And this will always have to be plural, given the semantics of +. The second option is more attractive, because it gives a principled answer to the question why split-bound pronouns are plural rather than singular. In the first option, this is stipulated and not related to what plural or singular mean. The features inserted by the operation in (53) are, after all, only visible to the phonology and not interpreted.

By the same token, of course, it is very unsatisfying that we need to posit an operation like (53) in the PF-derivation at all, even one which is only responsible for person features. The various clauses in (53) do not look simple or natural from a purely formal, morphological point of view. Moreover, clauses (ii)–(iv) bear an uncanny resemblance to a set of theorems about sum-formation and inclusion:

(55) Let s_c and h_c be atoms.[30] Then:
If x or y includes s_c, $x \oplus y$ includes s_c.
If neither x nor y includes s_c, but x or y includes h_c, then $x \oplus y$ doesn't include s_c but includes h_c.
If neither x nor y includes s_c or h_c, $x \oplus y$ doesn't include either s_c or h_c.

Given the ontological facts in (55) and the semantics of the three person features, the PF operation in (53) largely duplicates predictions that we would already be making without it if all the person features on split-bound pronouns were freely base-generated and semantically interpreted. It is impossible to accept this as a mere accident. Yet we cannot simply get rid of (53) and let the semantics do all the work. In a very small subset of the cases that (53) correctly describes, a split-bound pronoun is first or second person not because of what these features mean, but because one of its bound components brings them in via Feature Transmission. In other words, it is crucial to our analysis that the operation in (53) can be fed by Feature Transmission, and since the latter is a PF rule, the former must be too. We are therefore left in the uncomfortable

[30] If s_c and h_c could be pluralities, the second and third clauses could be false.

situation that a pattern in the data which looks like it ought to fall out from the semantics, and which almost does, nevertheless has a few marginal instances that force us to attribute it to an arbitrary-looking non-semantic mechanism.

2.4 Summary and outlook

This paper has developed a mixed semantic and syntactic account of the distribution of φ-features on bound pronouns that I believe is more precise and has better empirical coverage than previous accounts of the phenomena. The main message, however, is that we cannot be satisfied with this story. The burden that we have ended up putting on the PF derivation is very likely misdescribed or misplaced. The operation we had to posit in the end for the person features in split-bound pronouns was especially impalatable. But it may well be said that this only vindicates the suspicions that some have already had about the Feature Transmission rule, a PF operation which relies on a syntactic definition of semantic binding. It would certainly be desirable if we could preserve the more natural ideas in the present package (the semantics of features, the existence of underspecified pronouns at LF) and explain away the apparent need for feature-copying operations in the syntax or morphology, unless these can be reduced to independently known syntactic and morphological mechanisms. At the time of this writing, such alternatives are only available in rough sketches or for limited subsets of the data. But far from discrediting or superseding those efforts, the present paper will hopefully help spur their pursuit.

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3

On the Semantic Markedness of Phi-Features

ULI SAUERLAND

When linguists talk about features, they usually talk about markedness as well. One reason is that feature systems are more efficient if there is an unmarked default value contrasted with a marked value. Nevertheless it is often difficult to determine which feature value should be regarded as the unmarked one; φ-features are a particularly interesting case since they are important in many different domains of linguistic inquiry, and therefore markedness considerations arise in several different ways. The main goal of this paper is to establish the concept of semantic markedness and its independence from morphological markedness.

To my knowledge, Greenberg (1966) was the first to investigate markedness in the domain of φ-features. He presents several tests from different domains for markedness. Later works (Noyer 1992, Harley and Ritter 2002) focus more narrowly on morphological markedness. My focus, however, is semantic markedness. One of Greenberg's tests for markedness, which I discuss below as *Dominance*, is semantic. I develop three other tests for semantic markedness. Using these tests, I then investigate the semantic markedness of person, number, and gender features. While my results often correlate with morphological results, this is not the case for number. In the person domain, I conclude that there is clear evidence that third person is featurally unmarked in all languages (cf. Benveniste 1956). I furthermore conclude that second person is semantically less marked than first person in English and other languages that lack the inclusive/exclusive distinction, while first and second person are equally marked in languages that have the distinction. In the number domain, I argue that the plural is unmarked in all languages. In languages that possess

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a dual, it seems furthermore that the dual is less marked than the singular, but not all tests are conclusive on this point. Finally for gender features, I argue that the marked value of the feature distinguishing humans from non-humans can vary from language to language. However, in all languages that distinguish a masculine from a feminine gender, the masculine gender is less marked.

3.1 Markedness and features

The concept of markedness is applied differently in different lines of inquiry; see Ludwig (2001) for an overview. At least two types of markedness considerations are important for φ-features. In recent morphological work by Harley and Ritter (2002), both types are encoded in a feature structure.[1] Diagram (1) shows a part of this structure:

(1) Minimal
|
Augmented

This diagram encodes, on the one hand, a claim that the feature [Augmented] is more marked than [Minimal] in the sense that the former entails the presence of the latter. In the following, I will call this concept Feature Markedness. Diagram (1) furthermore encodes the claim that among the augmented and non-augmented items, the augmented ones are marked. This I refer to as Category Markedness in the following. In the remainder of this section, I introduce the two concepts of markedness in more detail.

The latter type markedness consideration, Category Markedness, is very basic in linguistic theory since it arises directly from the categorial nature of much of language. For example, a speech sound may be categorized as either voiced or unvoiced, a phrase as nominal, verbal, or belonging to some other category, and some referent as being one entity or not. Any such categorization process makes reference to properties of the item that is categorized. In a binary distinction, whichever category directly reflects the presence of a certain property is regarded as marked.[2]

Linguistic theories capture the discrete categories of language by means of features. One member of an opposition is said to possess feature F while the other member does not. Features are usually taken to reflect category markedness as in example (1): the marked member of a category division is assigned a feature F, while the unmarked member is not. In this way, the

[1] Harley and Ritter (2002) encode markedness in a third way; namely, by underlining a default. It remains to be seen whether this is important for semantics.

[2] I assume that binary distinctions are the general case, as other distinctions can be reduced to it.

markedness of a categorial distinction is directly expressed in featural linguistic representations. However, this is a convention; in principle, a mental mechanism that assigns the feature F to the unmarked member of a categorial distinction is only minimally more complex than one that assigns it to the marked member.

Linguistic entities themselves may be categorized too; for example, by a rule that applies to some entities, but not to others. Such categorizations are usually recategorizations since the linguistic entity is typically already some structured array of discrete features. For example, the correspondence between morphemes and bundles of semantic features can be viewed as such a recategorization: feature bundles that correspond to the same morpheme belong to the same category.

Markedness considerations arise with recategorization mechanisms primarily in the same way as with other categorizations: the marked one of the target categories corresponds to a property of the feature bundle that the categorization mechanism is sensitive to. For example, a linguistic mechanism may associate the feature bundle [A B] with the lexical item /x/ while it otherwise associates the same position with the lexical item /y/. In this case, /x/ would be the marked member of the categorization that the contrast between /x/ and /y/ reflects.

Feature Markedness is the second general type of markedness consideration that is important for φ-features. It concerns the relationship between two categorial distinctions and their corresponding features. If it is the case that the categorial distinction underlying feature B can only be applied to individuals that possess a property underlying feature A, B is said to be a more marked feature than A. For example, only consonantal phonemes can possess the property coronal, and only countable referents can possess the property of being exactly one object, and therefore coronal and singular are considered more marked features than consonantal or countable. This type of markedness is directly entailed by the nature of two categorization processes, but of course often the mechanisms underlying categorization processes themselves are not evident. Indirectly, recategorization can be used to draw conclusions about markedness in a different way. If we assume that recategorizations generally map marked categories to marked categories, recategorizations allow conclusions about category markedness in the domain of structures being categorized. For example, the plural has been considered marked because it is in many languages mapped to a phonologically more marked affix than the singular (Greenberg 1966).

Markedness relations among features have been argued to underlie feature-geometric structures in phonology (Sagey 1986) and morphology (Harley and Ritter 2002). In such a feature structure, the more marked feature is regarded as a dependent of the less marked feature. Feature-geometric structures express at least two other claims about markedness: on the one hand, the use of feature geometry entails that deletion of a less marked feature also removes any dependent feature connected to it. This also applies to mechanisms other than deletion; for example, spreading rules in phonology. On the other hand, only a positive value can have a dependent in many feature structure systems.[3] This assumption entails that Feature Markedness is directly related to Category Markedness: only the member of a category distinction that is marked by a feature can be related to a less marked feature G.

For the following, Category Markedness is more important than Feature Markedness. However, when comparing my results with those of morphological theory, it is important to keep in mind that the other notion of markedness exists.

3.2 Semantic markedness

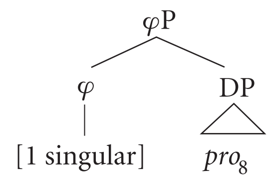
The two concepts of markedness—Category Markedness and Feature Markedness—which the previous section introduced, can both be applied in semantics. Semantic mechanisms categorize aspects of a mental representation of a situation, which I assume always includes a perspective component relevant for person. For example, the number features categorize groups of objects in a situation by their numerosity. Similarly, tense categorizes the time of some event in a situation to the time that is "now" under the perspective of the situation. In this categorization process, Category Markedness applies: the marked member of a category opposition is the one that possesses the property determining the opposition. Feature Markedness can apply to pairs of semantic categorizations. For example, I argue below that there is a feature [first person] in English that entails the feature [participant person] which first and second person in English share. Whenever there is such an entailment between feature A and feature B, feature A is semantically more marked than feature B.

The tests for markedness that I present in this section can be best understood on the basis of a theory of sentence interpretation, in particular, with respect to the interpretation of φ-features. For concreteness, I adopt a set of assumptions I argue for in recent work (Sauerland 2003), but I believe the test results ultimately can stand independently of these assumptions. I assume

[3] Harley and Ritter (2002) circumvent this notational limitation by introducing underlining for unmarked categories.

that φ-features, when they are interpreted, are always interpreted as a presupposition on the reference of an expression that denotes an individual. This assumption is generally made for φ-feature marking on pronouns (Cooper 1979, Heim 1994 and this volume, and others). As an example, consider the pronoun *I* in English. Within the Tarskian approach to binding, the reference of a pronoun generally is the value the variable assignment assigns to the index of the pronoun. For concreteness, consider an occurrence of *I* that bears index 8. I assume that the φ-features apply to this index as indicated by the following structure.

(2)

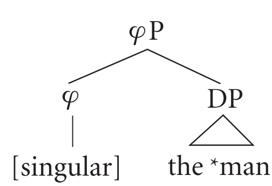


Since the pronoun bears index 8, the referent of the pronoun will be whatever is stored in position 8 of the variable assignment. The φ-features of *I*, first person and singular, however, presuppose that the referent of *I* has certain properties which I discuss more generally below. In this particular example, the referent must overlap with the speaker of the utterance (the presupposition of first person) and the referent must be a single individual (the presupposition of the singular). The combination of the two presuppositions entails that the referent actually must be exactly the speaker of the utterance.

In the work referred to above, I argue that the presuppositional account of φ-features should be extended to all occurrences of φ-features that are interpreted at all. For the following, only the case of definite descriptions is relevant. In this case, the account carries over straightforwardly.

Consider the definite description *the man*. I assume that it has the structure in (3) bearing the feature [singular]. The DP *the *man* itself, I assume, is numberless and picks out the most salient single man or group of men. But, the feature [singular] presupposes that the referent be only a single individual.

(3)



The semantic contribution of a φ-feature F on this approach is to divide the domain of individuals (which I assume to include pluralities) into two categories: those marked by feature F and those not marked by F. The entities marked by F are those that satisfy the presupposition of F, while the others do not. Of course, this approach only applies to interpreted φ-features. I assume that φ-features in positions other than a φ-head are never interpreted, but are reflexes of purely syntactic agreement. These uninterpretable φ-features must be syntactically checked (in the terminology of Chomsky 1995) or controlled (in the terminology of Corbett 1991, 2000) by a φ-feature in a φ-head. This includes the φ-features on nouns, verbs, adjectives, and determiners. The syntactic mechanism underlying this process is not a concern in this paper, as I focus on the interpreted φ-features. Furthermore, there are two cases where the φ-features in the φ-head do not seem to be interpreted: grammatical gender (and possibly number) and φ-features on bound pronouns (Heim 1994, Pollard and Sag 1994, Kratzer 1998, von Stechow 2003). Both cases are not central to the following, and therefore I do not go into an account of these phenomena here (see also Heim, this volume).

Now consider the question what exactly is the semantic inventory of φ-features and what are their presuppositions. To address this question, I will develop a set of tests for semantic markedness. Underlying these tests is the insight that the presuppositions of φ-features are tied to a categorization of semantic entities. Consider abstractly the case of a binary division into two categories A and B. In this case, we expect one of the categories—let's say A—to be marked and therefore to correspond to a feature F. The unmarked category B, however, need not correspond to any feature. From the semantic point of view, then, F would be interpreted as the presupposition that the referent has whatever property characterizes category A. The absence of F, however, would need to be interpreted as the referent not having this property that characterizes A, since the absence of F marks membership to category B. In fact the interpretation principle that establishes this step is independently required. It is a very natural principle since it is essentially a version of the Gricean quantity maxim applied to presuppositions. Heim (1991) first argued that this principle, Maximize Presupposition in (4), must be assumed and formally distinguished from the quantity maxim: in contrast to the quantity maxim, (4) in effect requires a speaker to be maximally redundant, rather than being maximally informative.[4]

[4] The principle as stated in (4) is simplified, but sufficient for my present purposes (see Percus 2006).

(4) *Maximize Presupposition*: Presuppose as much as possible in your contribution to the conversation.

Because of (4), the presuppositional feature F must be used whenever its presupposition is satisfied. This entails that the absence of F satisfies (4) only in case the referent does not satisfy the presupposition of F. This then entails that, if the referent is known to belong to either category A or B, it must belong to category B.

3.2.1 *Dominance*

Of the tests for markedness that Greenberg (1966) presents, only one is semantic in nature. He attributes this test to Arab grammarians and refers to it as *taghlīb* ("dominance"). Givón (1970) uses the term *resolution rule* (see also Corbett 1991), but I adopt the term Dominance. Dominance is exhibited in conjoined noun phrases and other cases of reference to pluralities when the φ-feature specifications for person or gender of the conjuncts (or member of the plurality) differ. In the case of gender, the less marked gender is the gender of the entire coordination. For example, in Czech, the coordination of a man's name and a woman's name in (5) requires masculine agreement on the verb, which argues that masculine is less marked than feminine in Czech.

(5) Jan a Věra šl-i do biografu
Jan and Vera went-MASC.PL to the movies
"Jan and Vera went to the movies." (Vanek 1977: 31)

The dominance test must be applied with care to control for the possibility of agreement with one conjunct. This has been most extensively discussed for Arabic, where conjoined postverbal subjects in general allow two agreement patterns: agreement with the entire coordination or agreement with only the first conjunct. Example (6a) illustrates the latter pattern. Aoun et al. (1994, 1995) argue that first conjunct agreement does involve clausal coordination rather than coordination of two NPs, and show several ways to control for this possibility. For example, group level predicates like *meet* in (6b) and binding of a reciprocal as in (6c) require plural agreement.

(6) LEBANESE ARABIC

a. Keen Kariim w Marwaan ʕam yilʕabo
was.3MASC.SG Kareem and Marwaan ASP playing
"Kareem and Marwaan were playing."

b. *Ltaʔa Kariim w Marwaan
met.3MASC.SG Kareem and Marwaan
"Kareem and Marwaan met."

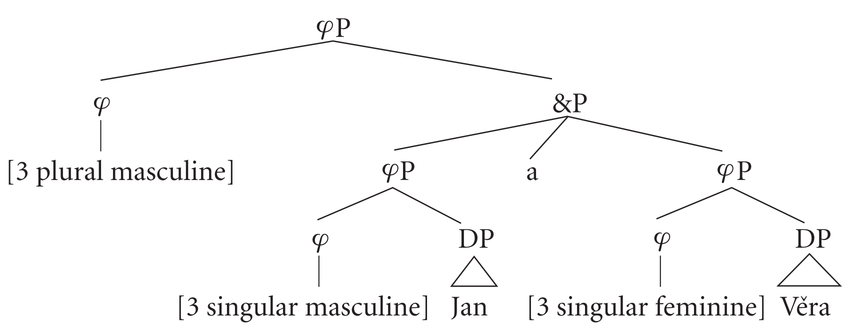
c. *Biḥibb Kariim w Marwaan baʕḍun
love.3SG Kareem and Marwaan each other
"Kareem and Marwaan love each other."
(Aoun et al. 1994: (30b), (43a), and (48b))

Furthermore, Corbett (1991) points out that, if there is agreement with one conjunct only in any language, this must apply to all φ-features at the same time. If the conjuncts are singular, plural agreement on the verb or another target therefore indicates that agreement is with the entire conjunction.

A note concerning the notation of φ-feature bundles is also necessary. The decomposition of the categories into features is not evident, and would also not be informative before it is discussed in detail. This holds especially for the most unmarked category of each type which would be featurally unmarked. At this point, it is convenient to use values like [masculine] and [feminine] as abbreviations for feature bundles, which may even be empty. It should be kept in mind that these feature bundle abbreviations are distinct from features. This is especially confusing in those cases where I ultimately conclude that a feature with the same name exists.

I assume that coordinated DPs involve three sets of φ-features: one for each conjunct, and one for the whole conjunction. Consider the structure for the subject of (5).

(7) Jan a Věra



The presupposition of [masculine] in the highest φ-head is satisfied, while that of [feminine] would not be satisfied in the same position. For the features underlying the gender features this suggests that the features in [feminine] presuppose that all members of a referent are female. Then [masculine] could be unmarked and the Maximize Presupposition maxim would entail that masculine can only be used with referents that are not all female. Note, however, that this reasoning in principle could also be reversed: we could assume that [masculine] presupposes that a group contains male members, while [feminine] is unmarked. Then Maximize Presupposition would entail that [feminine] could be used for all groups that do not have any male members. Therefore, Dominance alone cannot be used to establish a particular markedness claim, but only in conjunction with assumptions about the logical properties of features. In the system where [feminine] is marked, on the one hand, the feature bundle [feminine] is downward entailing in the following sense: if a semantic entity X satisfies the presupposition of [feminine], any non-empty part of X also satisfies the presupposition of [feminine]. In the system where [masculine] is marked, on the other hand, the feature bundle [masculine] is upward entailing: if X satisfies the presupposition of [masculine], any Y that X is a part of also satisfies the presupposition of [masculine]. For gender, it seems intuitive that the gender features should be downward entailing. But only when we take the results of other markedness tests into account will we really be in a position to conclude that the masculine gender is less marked than the feminine one.

The dominance test cannot be applied to number, as Greenberg already notes, because the number properties of a coordination are necessarily different from that of the coordinates. However, it can be applied to person. Consider the German example (8), which shows that second person agreement is required with a coordination of a third person and a second person.

(8) Tanja und Du sollte-t miteinander reden.
Tanja and you should-2PL with each other talk
"Tanja and you should talk with each other."

In this case, too, we cannot directly conclude which category is characterized by a marked feature. We could assume that third person is marked by a downward-entailing feature presupposing that the referent does not contain the addressee as an element, while second person is unmarked. Or we could assume that second person is marked by an upward-entailing feature that presupposes that the referent contains the addressee as an element, and third person is unmarked. Again only the results of further markedness tests can really determine the full analysis, and I show below that person features are upward-entailing. Therefore, dominance works in opposite ways with gender and person features: with gender, the least marked category is inherited by the coordination while it is the most marked one with person.

3.2.2 *Quantification*

The second test for semantic markedness makes use of the fact that the reference of a DP can vary when the DP occurs in the scope of a quantifier. The interesting case arises if some of the referents belong to one category and some to the other of a categorial distinction. In this case, we expect that the referring DP will bear the less marked feature. The marked feature should only be used if all the referents belong to the marked category.

To illustrate this point, consider the facts in (9), which concern verbal tense in English (Sauerland 2002). Tense marking in English distinguishes between events that took place in the past and events that did not. In (9), however, tense occurs in the scope of a universal quantifier that ranges over the Tuesdays of the present month. There are three cases to consider. The first two are not revealing anything about markedness. If all the Tuesdays quantified over are in the past—the time of utterance is after the last Tuesday of this month—the past tense (9b) must be used. If all the Tuesdays quantified over are not in the past—the time of utterance is before or on the first Tuesday of this month—the present tense (9a) must be used. The relevant test case for markedness, however, is: if some of the Tuesdays quantified over are in the past, and some are not—the time of utterance is after the first Tuesday of this month, but on or before the last Tuesday—the present tense (9a) must be used.

(9) a. Every Tuesday this month, I fast.
    b. Every Tuesday this month, I fasted.

Since in the case of mixed reference the present tense is used, it can be concluded that the present tense is unmarked, while the past tense is marked. Within an analysis of tense where tense is interpreted as a presupposition on the reference of a time variable (Abusch 1997 and others), this insight is captured by the following lexical entries: the past tense presupposes that the referent of the time variable is in the past of the utterance time, while the present tense has no presupposition. The Maximize Presupposition maxim will then ensure that the present tense is only used in case the presupposition of the past tense is not satisfied. Therefore, past tense is used with past times and present tense with present times. In the scope of a quantifier, though, the asymmetry observed in (9) is predicted: the marked value [past] can only be used if all referents satisfy the presupposition, while the unmarked value [present] can be used in all other cases. The quantification test for markedness is the most useful one of the tests for markedness that I discuss in this paper, since it unequivocally indicates which category is marked.

3.2.3 *Epistemic status*

A further test for markedness can be gained from considering the epistemic status of semantic properties characterizing one category. In many cases of markedness contrasts, the marked member entails that the speaker is certain that some property holds, while the unmarked member only entails that the speaker takes it to be possible. Consider for example the contrast between definite vs. indefinite marking on English noun phrases (Heim 1991).

(10) a. Robert caught the 20 ft. long catfish.
b. Robert caught a 20 ft. long catfish. (Heim 1991: 121)

The definite version (10a) can only be used if the speaker is certain that there is a unique twenty-foot-long catfish. The indefinite, however, does not require the speaker to be certain that there is a second twenty-foot-long catfish. For (10b), it is sufficient that the speaker believes that it is possible that another twenty-foot-long catfish exists. Therefore, Heim (1991) concludes that definiteness is marked, while indefiniteness is unmarked.

With tense marking, the epistemic status also correlates with markedness. Consider the following scenario: an expedition left from our place a couple of weeks ago, and we have lost contact. We are wondering how many provisions they still have. In this scenario, (11) could be used, but the same sentence with the past tense would not be felicitous unless I knew for sure that the expedition had already run out of supplies.

(11) The water runs out the same day as the food does. But, I don't remember when exactly that is. It might have been last week already.

Example (11) shows that the present tense only entails that the event described might take place at the present time.

The contrast in epistemic status between the two members of a categorial distinction follows directly from the semantic implementation of the markedness contrast via the Maximize Presupposition maxim. To use the marked member of a morpheme pair, the speaker must be certain that its presupposition is satisfied. Otherwise the unmarked member must be used. Therefore, it is expected that semantic categorizations divide into a category that is characterized by some property that must certainly obtain, and a category that is characterized by the opposite possibly obtaining. However, this does not entail that the member characterized by certainty of some property P is necessarily the marked member. It could be that the marked member is characterized by the property "P is possible", and then it would follow that the unmarked member is associated with the epistemically stronger property that P be necessarily false. However, in general, the stronger epistemic status seems to correspond to markedness. Likely this is the case because the underlying properties characterizing semantic categories are not epistemically modalized at all.

3.2.4 *Emergence after blocking*

The final test for semantic markedness that I am aware of makes use of phenomena that block the marked form. In that case, the unmarked form is predicted to emerge. The blocking of a form could obtain for a variety of reasons: morphological, syntactic, or pragmatic. The identification of such blocking principles is not always straightforward, and typically tied to a particular language.

For example, the phenomenon of singular *they* in English (Huddleston and Pullum 2002, Johnson 2004) could be analyzed as a case of blocking with emergence of the unmarked form. In some dialects of English, the plural pronoun can be used with singular reference when the referent was introduced by a quantifier or an indefinite as in (12).

(12) a. Some student left their umbrella.
b. One student in the class got an F. I bet they are not happy about that. (Johnson 2004)

It seems reasonable to assume that English speakers who use singular *they* have adopted a convention to avoid the gender-marked third person singular forms of pronouns in the circumstances described above. The fact that in this case the plural can be used then shows that the plural is unmarked.

The emergence of the unmarked form if the marked form is blocked follows from the interpretation system based on Maximize Presupposition that I proposed. Recall that generally use of the unmarked form is licit whenever the marked form is not applicable. In the examples considered in the previous sections, the marked form was not usable because its presupposition was not satisfied. However, we expect the unmarked form also to be usable when the marked form is blocked for other reasons. Precisely this is what we observe in cases like singular *they* where the marked form (the singular) is blocked by a pragmatic convention.

3.3 Semantic markedness of φ-features

3.3.1 *Person*

Person features are interesting because they are cross-linguistically very similar (Cysouw 2000, Siewierska 2004). The main point of variation in person exists between languages that draw an inclusive/exclusive distinction in the first person plural, and those that do not.[5]

There is clear evidence from all four of the markedness tests that third person is the most unmarked feature bundle among the person specifications, confirming the insight of Benveniste (1956). In Section 3.2.1 on dominance, we already saw by means of example (8) that second person is more marked than third person in German. Since first and third plural verbal agreement are homophonous in German, the dominance of first over third person is harder to show directly. However, it is entailed by the observation that first person dominates second person that (13) illustrates.

(13) Du und ich sind einander noch nie begegnet.
you and I are.1PL each other yet never met
"You and I haven't met yet."

Corbett (1991: 262) presents person dominance data from Czech. The two facts in (14) show that in Czech too first and second person dominate third person.

(14) a. Bratr a já se uč-íme hrát na klavír.
brother and I self.ACC teach-1PL to play on piano
"My brother and I are learning to play the piano."

b. Tvůj otec a ty jste si podobni.
your father and you be.2PL self.DAT alike
"Your father and you are alike."

Consider the quantification test next. Consider the English fact in (15) in a context where *us* refers to a group of three people, the speaker, the addressee, and a third person. Example (15) shows that the third person pronoun *his* is used when the reference of the pronoun varies between first, second, and third person.

(15) Everyone of us has to call his mother.

The third markedness test, the epistemic status, can be executed with examples like (16). Use of the third person does not rule out reference to the speaker as impossible.

(16) The winner will be a lucky guy. He could be me.

Initially, it may seem that facts like (17) show that even necessary reference to the speaker by means of a full DP requires third person marking. But, I argue now that actually a full DP never can necessarily refer to the speaker.

[5] One further, peripheral, area where variation exists is logophoricity (see, for example, Schlenker 2003). However, the consideration of logophoricity with respect to semantic markedness is outside the scope of this chapter, in particular since the relevant facts are not readily available.

(17) My wife's husband is a lucky guy.

Note that the use of (17) brings about a special semantic effect: by asserting (17), I would express that even if somebody else had married my wife that other guy would be lucky. This difference confirms my proposal because it shows that (17) requires a consideration of the counterfactual worlds where I am not my wife's husband, and in this circumstance the third person must be used. The fact that first person is impossible with full definites, however, follows from a further pragmatic principle which forces use of a pronoun whenever the referent is certain to be the speaker (cf. Schlenker 2005).

Finally, consider data that show the emergence of the third person in case another person is blocked. The data I claim to show this effect involve politeness forms of pronouns. I use German in (18) to illustrate this point. In German, the third person plural can be used to refer to the addressee or the addressees if the relationship between speaker and hearer is formal.

(18) Könnten Sie bitte etwas rücken!
could pro.3PL please a little move
"Could you please move over a little!"

I propose to understand (18) as the result of blocking of the second person address in formal conversation in German. Therefore the unmarked third person emerges. Note that diachronically the use of the third person plural for address in German derives from Spanish where the phrase *your honors* was used for formal address. But, this derivation cannot be the synchronic explanation of the German data.

Now consider the relationship of first and second person both in languages like English without an inclusive/exclusive distinction in the first person plural and also in languages with this distinction. Based on morphological evidence, Noyer (1992) argues that three person features are available to languages: [speaker], [addressee], and [participant]. Noyer understands these to indicate the semantics of including the speaker, including the addressee, and including at least one of the participants. Consequently, Noyer also points out that the feature [participant] must be present if and only if at least one of [speaker] and [addressee] is present.

Note though first that the lexical entries of Noyer (1992) are not precise enough on one point. This is illustrated by (19) which would be used to address a group.[6]

(19) The one of you I have in mind is/*are special.

[6] Ede Zimmermann (p.c.) first brought such examples to my attention.

Note that the subject in (19) must refer to one of the people addressed, but nevertheless third person agreement is required on the verb. It seems therefore that second person in English presupposes that a referent so marked contains all of the addressees. The feature [participant], on the other hand, does not presuppose inclusion of all the participants, but only of either the speaker or the entire group of hearers. I will make use of Noyer's features with the semantics understood so as to yield the correct result for (19).

For languages with the inclusive/exclusive distinction, I follow Noyer's analysis that the system is driven by the features [speaker] and [hearer]. Consider, for example, the plural pronominal forms of Sursurunga (Noyer 1992: 172). The first person inclusive form *git* is used when the group referred to includes both the speaker and the addressee. In analogy with (19), I would expect, but do not know for a fact that *git* cannot be used when a group of people is addressed, but not all addressees are part of the referent of *git*. The category of referents that uses *git* should be the most marked of the Sursurunga paradigm. Less marked should be the first person exclusive *gim* and the second person *gam*. The least marked form should be third person *di*. In the Sursurunga paradigm, the relative markedness of the first person exclusive and the second person is not easy to determine. The Dominance test cannot be applied because a coordination of a first and a second person is to be marked with the first person inclusive. While this shows that the first person inclusive is the most marked form, it leaves open the relationship of the exclusive and the second person. The other possible tests, however, I discuss below for English, and, as I will argue, they are difficult to apply as well. If Sursurunga were to make use only of the features [speaker] and [hearer], we would not expect first person exclusive and second person to exhibit a markedness contrast.

Now consider languages without the inclusive/exclusive distinction. As suggested by Irene Heim (personal communication), I propose that these languages have the same semantic features, [speaker] and [hearer], and the distinction between inclusive and exclusive first person is only obscured by homophony of the two forms. The alternative would be that the feature [hearer] is not present, but instead a feature [participant] which is shared by first and second person (cf. McGinnis 2005).

Consider first the Dominance test. On both analyses, we expect the first person form to dominate in coordination of first and second person. However, this is for different reasons: On the account I advocate, the coordination is specified as [speaker hearer] as in Sursurunga, but this is homophonous with [speaker] in these languages. On the alternative account, the coordination is specified as [speaker participant] which uniquely corresponds to first person morphology. The result both analyses predict is borne out. In English, this cannot be seen from the verbal agreement, but it is clear when a pronoun is used as in (20).

(20) You and I, we are special.

The dominance relationship also holds in German (21a) and Czech ((21b), from Corbett 1991: 262).

(21) a. Du und ich sind/*seid etwas besonderes.
you and I be.1PL/*be.2PL something special
"You and I are something special."

b. já a ty zůstan-eme doma
I and you will stay-1PL at home
"You and I will stay at home."

The quantification test, however, argues in favor of the homonymy analysis.[7] Consider the quantification data in (22), where clearly third person, rather than second person agreement is forced.

(22) a. One of you and me has/*have to go.
b. Each of you and me has/*have to go.

This is expected on the account advocated here because neither [speaker] nor [hearer] applies to both of the entities quantified over in (22). But, it is not predicted by the other analysis under consideration because there [participant] applies to both entities quantified over, and therefore second person agreement would be expected in (22).

Now, consider the epistemic status test. I conclude that it cannot be applied on the basis of an attempt assuming the following scenario:

The CIA is about to catch me and erase all my memories. But, I can still write a message, put it in a bottle, and throw it in the ocean. I can then hope to find the bottle myself one day. In that case, the literal German translation of (23) would be an appropriate way to start my message:

(23) To the finder: You might be me. In that case, you should do the following...

Initially, (23) seems to indicate that *you* does not exclude the possibility of first person reference, and therefore would support the claim that first person is more marked than second person. However, that account leaves the second sentence of (23) unexplained since here it is assumed to be certain that the

[7] Jonathan Bobaljik and Irene Heim (personal communication) helped me to see this point.

addressee is also the speaker and therefore first person ought to be used. Therefore, I conclude that in the circumstances above *I* and *you* refer to different temporal phases of the speaker. But then there is no uncertainty concerning the identity of speaker and hearer in (23), and therefore it is not an application of the epistemic status test. Since I could not find any other way to apply the test, I consider it not applicable in this case.

Finally consider the "emergence after blocking" test: I know of no examples that could be considered as blocking of the first person where the second person emerges as the unmarked form. This supports my claim that second person is not less marked than first person.

Overall then I have argued that third person is the least marked person category in all the languages I considered, and probably universally so. Furthermore, in languages with the inclusive/exclusive distinction, first person exclusive and second person probably do not stand in a markedness relation, but first person inclusive is more marked than any other person. In languages without the inclusive/exclusive distinction, first person is dominant in coordinations, but the quantification and blocking tests show that second person is not less marked than first person in these languages either. These markedness results suggest that languages both with and also without the inclusive/exclusive distinction possess the two person features [speaker] and [addressee], but in languages without the inclusive/exclusive distinction the first person forms are homophonous.

3.3.2 *Number*

In this section, I argue that plural is generally the semantically unmarked number, while singular is the most marked. The dual, in languages where it exists, is less marked than the singular, but more marked than the plural. The most frequent number distinction is that between the singular and the plural. Sauerland et al. (2005) discuss the relative markedness of these two categories in great detail. That article presents data not only from the three markedness tests other than dominance, which is inapplicable to number, but also further experimental evidence. The paper argues that all the data uniformly show that the plural is less marked semantically than the singular.

Now consider how the dual number relates to singular on the one hand and plural on the other. The data I found in the literature relevant to this question corroborates the markedness relations I proposed. Head (1978) and Corbett (2000) report that a couple of languages use dual pronouns for a specific level of formal address. Such data indicate that in these languages (Sursurunga, Boumaa Fijian, and others) the dual is less marked than the singular. However, one would like to see additional data on this phenomenon, for example, which form is used when the addressee is a plurality of individuals requiring this specific level of politeness. Furthermore, de Saussure (1993) already pointed out that the plural is used with dual reference in languages that lack a dual form.

My own preliminary investigation of Slovenian provides further evidence for the dual being less marked than the singular, but more so than the plural. Example (24) shows a Slovenian dual form.[8]

(24) Umij si obe rok-i
wash self both hand-DL
"Wash both hands!"

The dual in Slovenian is subject to an additional constraint of a pragmatic nature (see Dvořák & Sauerland, in press). Namely, the dual is restricted to coordinations of two singular conjuncts, noun phrases where *two* or *both* occur overtly, and occurrences of pronouns or noun phrases that have dual antecedents. For example, the plural is required and the dual cannot be used in (25) ((25b) in contrast to (24)). This is particularly surprising in (25) because almost all people have two hands. But even in a scenario where it is certain that the person addressed has two hands, the dual (25b) cannot be used. In Dvořák and Sauerland (in press), we propose that the dual can only be used when duality is relevant as indicated by the use of *obe* "both" in (24).

(25) a. Umij si rok-e
wash self hand-PL
"Wash your hands!"

b. *Umij si rok-i
wash self hand-DL

Example (25) shows that the plural is semantically less marked than the dual since the plural emerges if the dual is blocked.

Now consider the quantification test to determine the relative markedness of singular and dual in Slovenian. The data are equivocal, but I will argue that this result is expected. The scenario for which the sentences in (26) were tested is one where some students brought one book while other students brought two books, but no student brought more than two books. In this scenario, the plural seems impossible, but both the dual and the singular are possible.

[8] I am grateful to Bostjan Dvořák for sharing his native Slovenian intuitions and discussing many aspects of the Slovenian dual with me. All data in the following were tested exclusively with him.

(26) a. Vsak študent je prinesel s seboj svoj-o knjig-o
every student be.SG brought.MASC with self his.SG book-SG
"Every student brought his book."

b. Vsak študent je prinesel s seboj svoj-i knjig-i
every student be.SG brought.MASC with self his.DL book-DL
"Every student brought his books (dual)."

c. *Vsak študent je prinesel s seboj svoj-e knjig-e
every student be.SG brought.MASC with self his.PL book-PL
"Every student brought his books."

This result initially is entirely unexpected from the perspective of semantic markedness since it would entail the contradictory statements that the singular is simultaneously less and more marked than the dual. I believe though that the data do not speak to the issue of markedness at all. Note that in examples like (27) the correct number morphology is determined by the order of the disjuncts *eno* "one" and *dve* "two".

(27) a. Vsak študent je prinesel s seboj eno ali dve knjig-i
every student be.SG brought.MASC with self one or two book-DL
"Every student brought one or two books."

b. Vsak študent je prinesel s seboj dve ali eno knjig-o
every student be.SG brought.MASC with self two or one book-SG
"Every student brought one or two books."

Agreement with one conjunct only suggests that disjunction really applies at a higher level than the numbers themselves as in *one book or two books*. Note this would be analogous to the analysis of Aoun et al. (1994, 1995) for first conjunct agreement in Arabic mentioned in Section 3.2.1 above. For the data in (26) where also both singular and dual number are possible, it may then be similarly possible that at some level of representation the pronoun corresponds to a disjunction similar to *one book or two books* or the same with the reverse order of the disjuncts.

The epistemic status test, however, corroborates the claim that the dual is less marked than the singular. For this test, I considered (28) in the following scenario: I want to have someone over for dinner, but I only have enough food in the house to invite either Bill and his brother or John, who eats for two people.

(28) Naj pride-ta točno ob osmih
PRT come-3DL exactly at 8.LOC
"They (dual) should come at 8 o'clock."

In this scenario, the subject pronoun in (28) refers to the people I invite. But, this may be either one or two people. Since the dual as in (28) can be used, while the singular is not possible, this shows that the dual is less marked than the singular.

In sum, then, the plural is clearly less marked than the singular, which is the semantically most marked number. The dual, on the other hand, has an intermediate degree of markedness, lower than the singular, but higher than the plural. This would suggest that [singular] and [unaugmented] (shared by singular and dual) are part of the universal inventory, where [singular] entails [unaugmented] (cf. Harbour 2003).

3.3.3 *Gender*

Gender is the most heterogeneous of the φ-feature categories from a typological as well as from a semantic perspective. From the semantic perspective, it is striking how frequently gender is a purely formal reflex of morphological classes rather than being semantically determined. Furthermore, gender morphology often indirectly expresses other φ-features as well because gender distinctions are in many languages only found with the third person, though there are several languages like Arabic and Hebrew that have gender marking with other persons, too (Siewierska 2004: 104–6). I focus here on semantically contentful occurrences of gender in the third person, but even that domain I can only partially cover. Since gender is such a complex phenomenon, I focus on the following two points: Languages that draw a ±human gender distinction vary with respect to which of the values is marked. In languages that draw a masculine/feminine distinction, however, the masculine gender is uniformly less marked than the feminine.

Consider first the variation among languages drawing the ±human distinction. Corbett (1991) discusses gender dominance in coordination in several languages, and points out that dominance works in different ways for the ±human distinction. On the one hand, there are languages like Luganda (Corbett's discussion is based on Givón 1970). In Luganda, the gender class 2 on the verb indicates that a group consists of humans as in (29a), while class 8 is the verbal agreement used with non-humans as in (29b).

(29) a. ek-kazi, aka-ana ne olu-sajja ba-alabwa
5-fat woman 12-small child and 11-tall man 2-were seen
"The fat woman, the small child, and the tall man were seen."

b. en-te, omu-su, eki-be ne ely-ato bi-alabwa
9-cow 3-wild cat 7-jackal and 5-canoe 8-were seen

"The cow, the wild cat, the jackal, and the canoe were seen."
(Corbett 1991: 274)

Now consider the case of a mixed group consisting partially of humans and partially not. The crucial cases Corbett (1991) gives are in (30), where we see that only the non-human gender 8 agreement is possible. Corbett points out that (30a) is not fully acceptable in all dialects and registers of Luganda, but still is always preferred over (30b). This contrast shows that in Luganda non-human gender dominates human gender.

(30) a. ?omu-sajja ne em-bwa-ye bi-agwa
1-man and 9-dog-his 8-fell
"The man and his dog fell down."

b. *omu-sajja ne em-bwa-ye ba-agwa
1-man and 9-dog-his 2-fell (Corbett 1991: 274)

On the assumptions about markedness discussed in Section 3.2.1 above, and in particular the assumption that gender features are always downward entailing as discussed above, (30) indicates that non-human is the more marked gender in Luganda. Other languages that Corbett reports to behave like Luganda are Luvale, Dzamba, Likila, and Lingala, which are all Bantu languages, but also Archi, a Caucasian language.

However, the opposite dominance pattern also exists. Consider Tamil, which distinguishes between human and non-human in the plural as shown in (31). (In the singular, Tamil furthermore draws a distinction between masculine and feminine gender.)

(31) a. raaman-um mukukan-um va-nt-aaŋka
Raman-and Murugan-and come-PST-3PL.HUMAN
"Raman and Murugan came."

b. naay-um puune-yum va-nt-atuŋka
dog-and cat-and come-PST-3PL.NEUT
"The dog and the cat came." (Corbett 1991: 269)

The crucial case of mixed reference is (32), where human agreement is obligatory. (32) directly contrasts with the Luganda result in (30). I conclude from these data that the human gender is more marked in Tamil.

(32) raaman-um naay-um va-nt-aaŋka
Raman-and dog-and come-PST-3PL.HUMAN
"Raman and the dog came." (Corbett 1991: 269)

Corbett also mentions that Shona, which is a Bantu language like Luganda (Hawkinson and Hyman 1974), behaves in the same way as Tamil. At present, I have no data from other tests available regarding the markedness of ±human. On the basis of dominance, however, I conclude that the marked value of the ±human categorization is cross-linguistically variant.[9]

Now, however, consider languages that distinguish between masculine and feminine gender. Example (33) shows that [masculine] dominates [feminine] in French.

(33) un père et une mère excellent-s
a.MASC father and a.FEM mother excellent-MASC.PL
"an excellent father and mother" (Corbett 1991: 279)

Example (34) argues that [masculine] also dominates [feminine] in Czech.

(34) Jan a Věra šl-i do biografu
Jan and Vera went-MASC.PL to the movies
"Jan and Vera went to the movies." (Vanek 1977: 31)

Admittedly this is still a small sample, but, if we assume that Corbett would have reported any languages that show the opposite pattern from French and Czech, a generalization emerges. Therefore it seems at least likely that [masculine] is universally less marked than [feminine].

German, however, seems to be an exception to this generalization. German has generally grammatical gender, but with human individuals gender can also be interpreted. Hence, the pronouns in (35) can alternatively be neuter like their antecedent, or they can switch to the natural gender (female in both cases).

(35) a. Kein Mädchen glaubt, dass sie/es überfordert wird.
no girl believes that she/it overchallenged is
"No girl believes that she is overchallenged."

b. Jedes weibliche Mitglied will, dass man sie/es in Ruhe lässt.
every female member wants that one her/it in peace leaves
"Every female member wants to be left in peace."

Now consider the quantification test for interpreted gender marking in German. The relevant facts in (36) need to be considered in a scenario when either children of both genders are around for (36a), or members of both genders for (36b).

[9] One anonymous reviewer observes that the variation may be related to the number of gender classes, where Bantu famously has a great number, while Tamil only has three.

(36) a. Kein Kind glaubt, dass *er/*sie/es überfordert wird.
no child believe that *he/*she/it overchallenged is
"No child believes that she is overchallenged."

b. Jedes Mitglied will, dass man *ihn/*sie/es in Ruhe lässt.
every member wants that one *him/*her/it in peace leaves
"Every member wants to be left in peace."

In my judgment, a gender switch is impossible in (36) and only the grammatical neuter gender can be used. This could be taken to indicate that neither masculine nor feminine is unmarked in German. However, since German gender is so restricted semantically, the phenomenon in (36) might also be due to some other factor.[10]

In sum, this section has argued in favor of two generalizations concerning gender: Languages that draw a ±human gender distinction vary with respect to which of the values is marked. In languages that draw a masculine/feminine distinction, however, the masculine gender is uniformly less marked than the feminine.

3.4 Conclusion

This article introduced the concept of semantic markedness. I characterized semantic markedness by four tests: the dominance test (also referred to as resolution rules), the quantification test, the epistemic status test, and the emergence after blocking test. The discussion of the examples has shown that, while often not all tests are applicable, the tests that are applicable in all the cases I considered yield the same result. This shows that the four tests point towards the same underlying concept of semantic markedness.

The result for semantic markedness in the three domains of φ-features showed a correspondence with morphological results for person and gender, but not in the case of number. The discussion of person provided new evidence for the claim that universally the feature system for person has a speaker and a hearer feature (Noyer 1992), which presuppose that the group referred to contains all speakers or all hearers of the current speech act respectively. This hypothesis implies that no language lacks the inclusive/exclusive distinction in the featural representation. In languages like English that do not exhibit the distinction in the overt forms this must be because of homophony of the two forms. For gender, the results referred to above show

[10] Bittner (2006) points out an interesting result from first language acquisition: masculine is applied frequently also to non-masculine nouns in the earliest stage while feminine and neuter are only misapplied in later stages. This supports the claim that masculine is unmarked.

that masculine is semantically less marked than feminine, while markedness in the human/non-human distinction seems to vary across languages.

For number, I extended a result of Sauerland et al. (2005) to the dual. Sauerland et al. (2005) show that the plural is semantically unmarked in languages with a singular/plural number distinction. In this paper, I furthermore showed that, in languages with a dual, the dual is semantically less marked than the singular, but more so than the plural. In this case, morphological and semantic markedness diverge as the singular is considered to be the morphologically unmarked form by Greenberg (1966) and others (though Harbour 2003 takes a different view). Sauerland et al. (2005) suggest that this difference is due to the fact that the singular is the most frequently occurring form in natural discourse.

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4

Phi-Agree and Theta-Related Case

MILAN ŘEZÁČ

4.1 Agree and theta-related Case

The hypothesis examined in this paper is that DPs with theta-related Case cannot value a φ-probe under Agree:

(1) Case Opacity
A DP with theta-related Case may not value a φ-probe

Case and *Agree* are technical terms meant here in the framework of Chomsky (2000 et seq.), and the investigation is pursued in that framework, but the issue is by no means internal to it. I use the term *theta-related Case* for all morphological case marking whose identity depends on the local relationship of a DP to its selector, whether canonical for a theta-role or idiosyncratic (Woolford's (2006) lexical and inherent Case). It stands in contrast to structural Case, which is assigned to a DP by a functional head that does not select it, often at a potentially unbounded distance. The hallmark of theta-related Case is that it does not alternate with the embedding of an argument selector under different functional architectures such as raising and ECM, and that it cannot be borne by non-thematic elements such as *there*-type expletives, unlike structural Case.

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This is fairly perspicuous and widely shared. The terms Agree, or valuation of a φ-probe, are more resistant to a simple definition in relationship to morphological agreement, a nebulous phenomenon that has many syntactic and postsyntactic sources. I take Section 4.2 to lay out the distinction between Agree and agreement. Agree gives rise to one type of agreement morphology. Case Opacity claims that this type of agreement cannot be controlled by a DP with theta-related Case.

To see what is at stake, consider the English and Icelandic sentences in (2), around which ilk of example much of the discussion has turned. In English, the experiencer of *seem*, like all other PPs, cannot control subject agreement on the verb. If there is no further potential agreement controller, sentences like (2a) fail, and Lasnik (1999: 134) argues that this is because the φ-probe of T encounters no matching φ-set in its domain. Adding one rescues the construction, as in (2b). The invisibility of the PP to φ-Agree is an instance of Case Opacity; I return to P as equivalent to case morphology at the end of this section. The experiencer of *seem* in Icelandic presents a well-known minimal contrast with that of English (McGinnis 1998a,b). It also bears theta-related Case, a dative typical of experiencers; but unlike the English *to* PP, it is capable of undergoing A-movement and this lets sentences like (2a) survive in Icelandic, satisfying the "associate requirement" of the φ-probe of T, for example in (2c) with the experiencer moved to satisfy the EPP. However, regardless of whether it moves or stays *in situ*, whether there is another goal or not, it still cannot control subject agreement on the verb; only a sufficiently local nominative can, as in English (see Schütze 1997, Boeckx 1999, Holmberg and Hróarsdóttir 2003, among others).

(2) a. *There seem$_i$/seems to them$_i$ that someone left

b. There seem$_i$ to them to be some books$_i$ on the shelf

c. Mér$_i$ virðist/*virðast t_i [að þeir lesi bókina]
me.DAT seem.SG/*PL that they.NOM read the book.ACC
"It seems to me that they read the book." (Boeckx 2004: 28)

These two kinds of experiencers of *seem* are both bearers of theta-related case morphology, and neither can control the kind of agreement that a bearer of structural Case can. Phenomena like this are at the core of Case Opacity, under a suitably sharp understanding of what kind of agreement is meant. A clearly articulated and detailed exploration of Case Opacity is found in Schütze (1997: 40ff., chapter 4), particularly valuable for including theta-related Case visible to A-movement of the Icelandic type.[1] In recent minimalism (Chomsky 2000 et seq.), Case Opacity is part of a larger investigation into what the Case conditions are on a DP to control φ-Agree, for example whether it can bear previously assigned structural Case. Yet the relationship of theta-related Case to φ-Agree seems to carve out a rather independent domain of inquiry.

The inability of DPs with theta-related Case to control the Agree type of agreement is a striking property of many natural language systems. Spanish (3) is an example of theta-related Case in the specifier of ApplP obeying Case Opacity. The case morphology of the applied object *le* does not vary with the active/passive context and it does not value the φ-probe of T in the passive, which is valued instead by the next lower DP with structural Case. Hindi-Urdu (4) shows a similar pattern for the specifier of *v*P in the perfective, on one line of analysis (Comrie 1984, Mahajan 1989, Mohanan 1994, Davison 2004, Woolford 2006, Anand and Nevins 2006). The external argument is theta-related ergative incapable of controlling agreement, which is instead controlled by the highest DP without overt case morphology. As for the Icelandic experiencer dative, diagnostics converge on the ergative being visible to A-movement (esp. Davison 2004); compare Legate (2002, 2006) for the Warlpiri ergative. An analog invisible to A-movement is the English passive *by*-phrase if in the specifier of *v*P (Watanabe 1996: 125ff.), which also cannot control clausal agreement.[2]

(3) a. Los niños$_j$ **le**$_i$ entregaron$_j$ los libros
the children her.DAT gave.PL the books
"The children gave her the books."

[1] Schütze calls this the *Accord Constraint* (p. 41): "A nominal projection and a predicated-related head cannot check each other's case- or phi-features except via Accord. That is, both sets of features, case and phi, must be checked at once." Here *Accord* corresponds to *Agree*. I do not put things quite this way because strong evidence has accumulated since that Agree with a Case-bearing DP that has already Agreed for the same features is possible, at least sometimes (Polinsky and Potsdam 2001, Branigan and MacKenzie 2001, Carstens 2001, 2003, Bhatt 2006).

[2] There are many caveats. Sometimes what looks like theta-related Case seems to be the contextual realization of structural Case; Ormazabal and Romero (2002) make this argument for the "dative" of [human] transitive direct objects in *leísta* Spanish, impossible in passives (cf. Mohanan 1994: chapter 4 for dialects of Hindi-Urdu, varying in this respect). This can then be extended to more canonical configurations by defining the context of the realization in such a way that it always occurs, such as a local relationship to Appl (Adger and Harbour 2007 for the Spanish dative), or the presence of a lower DP with structural Case (Bobaljik and Branigan 2006 for Chukchi ergative and French causee dative). Going in the other direction, convergence requirements like the need for T's φ-probe to have a goal can contextually block certain lexical alternants, another way of looking at the ban on Spanish *leísmo* in passives on an analysis of it as a theta-related dative in the applicative construction.

b. Los libros$_j$ **le**$_i$ fueron$_j$ entregado
the books her.DAT were.PL given
"She was given the books." (Spanish)

(4) a. laṛkiyãã$_i$ rooṭii$_j$ khaatĩ ĩ$_i$ hãi$_i$
girls bread eating.FEM be.3PL
"The girls eat bread."
(*Imperfective: agreeing agent DP + non-agreeing object DP*)

b. laṛkiyõõ nee$_i$ rooṭii$_j$ khaaii$_j$
girls ERG bread ate.FEM.SG
"The girls ate bread."
(*Perfective: non-agreeing agent ERG PP + agreeing object DP*)
(Hindi; Comrie 1984: 858; my indexing)

There have been systems reported in the literature where DPs with apparently theta-related Case do control the same agreement morphology as a DP with structural Case, such as ergatives in Nez Perce (Woolford 1997). These are preliminary indications that Case Opacity may not be absolute. I will argue that in the final analysis Case Opacity is indeed incorrect, although its violations are rare. From their investigation will arise a theory of theta-related Case that accounts for its typical opacity, for its potential transparency, and moreover, for the modulation of the degree to which it can be transparent—deriving eventually a distinction between the English and Icelandic kind of theta-related Case. The gist of the theoretical proposal is as follows: (i) theta-related Case is a PP, and so normally an opaque domain (*phase*) for the DP within it; (ii) but φ-features of the DP can be transported beyond the phase by Agree between the P head of the PP and the DP, making the PP seem transparent. The evidence is drawn principally from the contrasting behavior of datives and dative agreement in dialects of Basque. Here is a roadmap:

- Section 4.2: Agree and agreement.
- Section 4.3: The structural Case system of Basque.
- Section 4.4: Theta-related datives in Basque dialects that observe Case Opacity.
- Section 4.5: Theta-related datives in other Basque dialects that do not.
- Section 4.6: Theta-related Case as PP, PP opacity, and P–DP Agree for transparency.
- Section 4.7: What can make a P have a φ-probe (make a PP transparent) in Basque.
- Section 4.8: Quirky Case as a minimally transparent PP.

The heart of the paper is Basque dialectal (and diachronic) variation of the type in (5) (for glosses, see Section 4.3). In most dialects the dative indirect object *geuri* "to us" controls a dedicated dative clitic in the agreement complex, *ku* in *deusku*, and it cannot affect the person and number agreement morphology that is reserved for structural Case arguments. In some dialects, it does do exactly that, controlling the person *g* and plural *it* of *gaitu*, a form that with a transitive verb would require an absolutive direct object *g(e)u* "us". In doing so, it retains dative case and other properties of an indirect object, though there are syntactic consequences to its control of absolutive-type agreement. The former type of dialects respect Case Opacity; the latter do not.

(5) **geuri**$_i$ emon d-e-u s-**ku**$_i$ / **g**$_i$-a-**it**$_i$-u
us.DAT given DFLT-THM-$\sqrt{3V}$-1PL / 1PL-THM-PL-$\sqrt{2V}$
"He has given it to us."
(Azkue 1924: 539/§770)

Theta-related Case of the kind borne by the English experiencer of *seem*, which is fully invisible to the φ-Agree and A-movement system, is clearly somehow different from the theta-related Case borne by the Icelandic experiencer of *seem*, which is visible to A-movement and as discussed in Section 4.8 even to φ-Agree, though not able to value a φ-probe. The Icelandic kind is called *quirky* (theta-related) Case. I will assume that all theta-related Case involves syntactically a PP shell around a DP. This is an important point, for a distinction is sometimes made between quirky and non-quirky theta-related Case in that the former has the P or case morphology adjoined to the DP and remains a DP, while the latter is a genuine PP (e.g., Stowell 1989). Such proposals are meant to entail that a DP with an adjoined case particle behaves as a DP for binding, scope, etc., while a DP within a PP cannot c-command outside. However, the desired distinction simply does not exist empirically. Genuine, semantically heavy Ps such as English *about* are invisible to c-command for all these purposes, whatever may be the explanation; see Pesetsky (1995: 172ff., 228ff.), Phillips (1996: 44ff.) for overviews, and specifically for the *to* experiencer of *seem*, see Chomsky (1986: 183; 1995: 304), Kitahara (1997: 63ff.), and especially McGinnis (1998a: 201ff.). The same holds true of visibility to A-movement. Table 4.1 summarizes the behavior of the experiencer of raising *seem* in different languages. The experiencer throughout is a DP with selectionally determined case morphology or adposition. The degree of fusion varies from full word-like independence of P to full attachment. However, this does not correlate in any way with the experiencer's visibility to A-movement.

In general, the morphophonological status of the expression of theta-related Case is irrelevant to its syntactic behavior. Case Opacity, in particular,

TABLE 4.1 Lack of correlation between morphophonology and syntax for *seem* experiencers

	"PP"		In between		"Case-marked DP"	
Properties of experiencer	English *seem* + *to* DP	Greek *fenete* + *se* DP	Basque *iruditu* + DAT	French *sembler* + *à* DP	Czech *zdát se* + DAT	Icelandic *virðast* + DAT
Visible to φ-Agree	no	yes	yes	yes	no	yes
Must attach to each conjunct	no	no	no	yes	yes	yes
Must attach to each modifier	no	no	no	no	yes	yes
Portmanteau with stem	no	no	no	no	yes	yes

Sources: French: Chomsky (1995: 305), McGinnis (1998a: 89ff.), Anagnostopoulou (2003: 220f., 181ff.); Greek: Anagnostopoulou (2003: 164ff., 171ff., 181ff.); Icelandic: Schütze (1997), Boeckx (1998), Holmberg and Hróarsdóttir (2003); Czech: Řezáč (2004: 339); Basque: see Section 4.4, and Trask (2003).

correlates simply with the presence of such theta-related marking, not with its expression; in none of these languages can the *seem* verb agree with its experiencer in the way it does with a nominative.

4.2 Agree and agreement

The term agreement covers a vast range of phenomena, overviewed in Moravcsik (1978), Corbett (1998, 2003). The last, quoting Steele (1978), begins his discussion with a working definition:

> The term agreement commonly refers to some systematic covariance between a semantic or formal property of one element and a formal property of another.
>
> (Steele 1978: 610)

> We call the element which determines the agreement the **controller**. The element whose form is determined by agreement is the **target**. When we indicate in what respect there is agreement, we are referring to agreement **features**. The syntactic environment in which agreement occurs is the **domain**. If we need any further "provisos", then we are dealing with **conditions**. (Corbett 2003: 159; bold in original)

In internalist approaches like the current one, agreement phenomena have received a number of analyses, and it is clear that different ones are appropriate for different phenomena, even if discussion is limited to the configurations germane here: the controller is a clausal argument, the target a clausal predicate or its extended functional projections within the clause up to the CP, and the features are the person, number, class/gender-type φ-features interpretable on the controller (potentially null). In this domain, some agreement seems to arise through postsyntactic prosodic merger between the target and the controller itself (see Jouitteau and Řezáč 2006 for an overview of relevant work on Celtic). Other agreement also spells out the controller itself on the target, but the two attach in the syntax with different properties than if post-syntactically, through clitic movement or base-generation (cf. Jelinek 1984). A cliticized controller of this sort may originate within a larger constituent with which it shares features, so it appears to constitute agreement with it, as in clitic doubling (see below).

Finally, some agreement turns out not to involve movement of phrase-structural elements at all, but rather the pure copying of φ-features from the controller to the target, visible at Spell Out but not at LF: "pure" agreement. Its empirical core are paradigms like (6), due to Lasnik (1999: chapter 6), since extended for example to cross-clausal agreement in Tsez (Polinsky and Potsdam 2001). These show that long-distance agreement alone is not a legitimate antecedent for Condition A anaphora that are below the agreement target but above the agreement controller. Similar paradigms show that such agreement is not visible for any other syntactic or semantic condition either.

(6) a. Some linguists$_i$ seem.PL$_i$ to **each other**$_i$ [t_i to have been given good job offers]

b. *There seem.PL$_i$ to **each other**$_i$ [to have been some linguists given good job offers] (Lasnik 1999: 138)

(7) *enir **nesā nesiz**$_i$ ɣutkā [ˤ**ali**$_i$ Ø$_i$-āk'i-ru-łi] Ø/r-iysi
mother his.REFL in house Ali.I I-go-PST.PRT-NMLZ.IV I/IV-knew
"The mother found out in his house that Ali had already left."
(Tsez; Polinsky and Potsdam 2001: 620)

It is properties of such pure agreement that have proved the model in understanding syntactic dependencies in recent minimalist theorizing, and given it the operation Agree in Chomsky (2000). The reasoning goes as follows. To a good first approximation, the conditions on the target–controller relationships have turned out to be the same as the conditions on the target–XP relationship in XP-movement, for example feature-relativized locality. Given that this is so, it seems natural to reduce movement to such agreement, viewed as feature-based dependency formation between a target and a goal, from which movement may be built up by adding a copy of the goal at the target. More natural than the alternative: to view pure agreement as movement minus something, for example as movement that does not occur by Spell Out.

On this hypothesis, the operation *Agree(F)* implements syntactic dependencies by taking an uninterpretable feature F, called the *probe*, on a *target*, and finding a matching feature F′ on a *goal*, subject to the conditions on syntactic dependencies. The matching feature *values* the probe. The valued feature on the target is visible for Spell Out but, being uninterpretable on it, deletes by LF. Extending the less processual terminology of agreement, one may speak also of the goal as the *controller*, *controlling* (= valuing) the probe. The issue of what features match (all φ-features; or just person/number, etc.) is at the forefront of questions about Agree (see Béjar 2003, Béjar and Řezáč 2004 and references therein).

The Agree relation between a probe and a goal may but need not be followed by *movement* of the goal or a larger category containing it. This is important in the present context because if the moved goal is an X^0, its movement to the target, also an X^0, will put two X^0s in a phrase-structurally local relation: a clitic or an agreement affix attached to say the verb in T(ense). As movement, this brings the interpretable feature of the goal to the target, and they are visible there at LF. The moved X^0, containing a φ-feature bundle, is naturally pronoun-like: clitics count as pronouns for the Binding Theory (Zubizarretta 1998: 107ff.), for weak cross-over (Suñer 1988, Anagnostopoulou 2003: 207ff.), and so on.[3] This kind of pronoun-like agreement is viewed here as a consequence of Agree + X^0 movement.

The X^0 that moves may be part of a larger structure within which φ-features are shared. For example, it may be the D head of a DP or a "big DP". This is the proposal developed by Uriagereka (1995), Anagnostopoulou (2003: chapter 4), among others, for the most clear type of pronoun-like agreement: the clitic doubling of DP arguments in Romance and Greek. The result of these mechanics is a valued φ-probe + a moved D (clitic) + a stranded DP. If there are morphological resources to spell out all the pieces separately, the result looks like subject clitic doubling in colloquial French and Northern Italian dialects, or complementizer agreement plus subject clitic doubling in West Germanic dialects (cf. Sections 4.5–6), as in (8). Such transparency need not be expected though—spellout of the φ-probe or clitic may be null, or their

[3] Specificity is not a necessary concomitant of such "pronominal" agreement, though it is sometimes made out to be so, and it is not expected to be: pronouns are capable of being variables bound by weak quantifiers. Accordingly, it is not surprising that for dative clitic doubling in Greek and Spanish, diagnostics such as weak cross-over suspension indicate pronominal content for the clitic, yet no semantic restrictions are imposed on its controller (see works by Suñer and Anagnostopoulou cited in the text, as well as Gutierrez-Rexach 1999, Bleam 1999, Anagnostopoulou 1999). Hence agreement that realizes moved X^0s does not logically restrict the semantics of the controller.

shared φ-features may be spelled out using one piece (see Carstens 2003: 407–8; 2005: 252–5, reviewing the proposal of Kinyalolo 1991).

(8) da-n_i-k_i ik_i komm-en
that-1SG-I(clitic) I.NOM come-1SG (West Flemish; Zwart 1997: 138)

Finally, it is an important conclusion about movement dependencies created by φ-Agree, X^0 dependencies among them, that they do not require that the moving element actually values the φ-probe of the target, though it is its goal. All kinds of things may prevent valuation once a matching relation between two features is established. Case Opacity has been viewed as one such condition: DPs that are visible to a φ-probe but whose theta-related Case prevents them from valuing it are those with *quirky* theta-related Case. In this case the DP or its D head may still move. If it is an X^0 that moves, there arises pronominal agreement in the absence of a φ-probe valuation.

The theory makes this prediction, provided that there are conditions such as Case Opacity that block valuation upon matching. Anagnostopoulou (2003: chapter 4) empirically demonstrates its correctness through a paradigm that will be important generally, and in Section 4.4 specifically; I will call it *quirky displacement*. From Section 4.1, a DP with quirky theta-related Case is visible to φ-Agree, and to the A-movement that occurs as a consequence of it, but it cannot value a φ-probe because of Case Opacity. An example of such a DP is the experiencer *à Marie / lui* of the matrix verb *sembler* "seem" in (9), diagrammed in Figure 4.1. Because *à Marie* is visible to the φ-probe of T, it cannot be crossed for locality reasons, and the first occurrence of Agree stops at it. No Agree with the lower DP *Jean*, and its subsequent A-movement, is possible, as (9a) shows. If the experiencer is a simple D (+ P spelled out as dative case morphology), it may as an X^0 move to adjoin to the (verb in) T as a clitic through this first Agree operation. This gets it "out of the way," and a second Agree operation across its vacated position with *Jean* is now possible, here followed by A-movement of *Jean* to create (9b).

(9) a. ?*Jean$_i$ semble à Marie [t_i avoir du talent]
* **locality*
Jean seems to Marie to have talent
"Jean seems to Marie to have talent."

b. Jean$_i$ lui$_j$ + semble t_j [t_i avoir du talent]
✓ quirky displacement
Jean her.DAT seems to have talent
"Jean seems to her to have talent."

(French; Anagnostopoulou 2003: 38, 40)

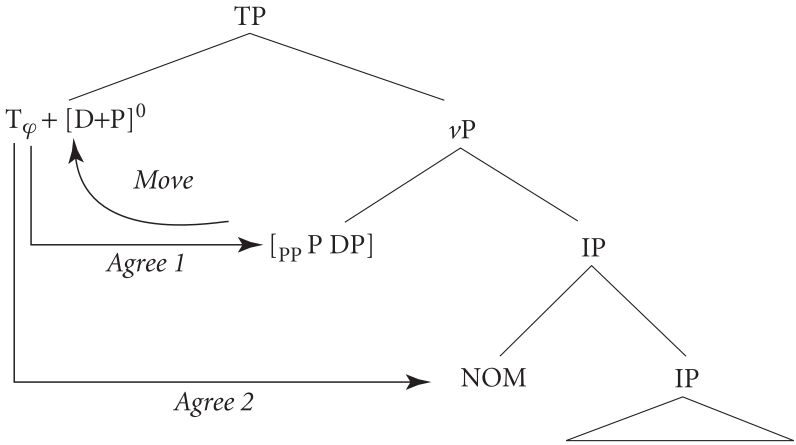

FIGURE 4.1 Quirky displacement

The full range of quirky displacement phenomena subsumes cases where the quirky Case intervener moves out of the way as a full DP to the specifier of TP; as the D head of a full DP "clitic doubling" the DP; or likewise, but forming an affixal attachment to the verb, giving rise to agreement, morphology: see Anagnostopoulou (2003: chapter 4), Chomsky (2000: 130f.), Řezáč (2004: chapter 2) and Section 4.4 here. It is the effect of the opening up of search-space for a φ-probe through evacuation of an intervener that suggests the intervener is in fact moved by the φ-probe, not independently; yet it does not value it. The quirky displacement phenomenon depends on the existence of quirky theta-related Case, unable to value by Case Opacity but visible to φ-Agree. One would like to understand the nature of so strange yet apparently real a beast. I will return to it when Case Opacity has become more tractable.

I will seek an inroad on this in the following three sections on Basque. To start with, I will argue that the ergative and absolutive are structural, and that, in most dialects, the dative is quirky and the special dative agreement morphology it controls comes about through quirky displacement. This provides sufficient resolution on the Basque system to present the minimally differing dialectal systems where the dative does indeed control the same morphology as arguments with structural Case.

4.3 Structural Case in Basque

Basque is morphologically an ergative–absolutive language: the subjects of unaccusative verbs and objects of transitives bear the same Case, the absolutive, and control the same agreement morphology. Nouns distinguish morphologically absolutive (unmarked), dative, and ergative cases, which are all potential agreement controllers, and about a dozen non-agreeing argumental and adnominal cases. Absolutive, dative, and ergative arguments control person and number morphology within the *agreement complex*, a single morphosyntactic word also containing tense, mood, and complementizer morphology. Agreement is typically obligatory when an argument in one of these cases occurs. In (10), the second person plural ergative *zuek* controls the prefix *z* and the final suffix *te*, the first person plural dative *guri* controls *gu*, the third person absolutive plural *ardiak* controls *zki*, the conditional mood is expressed by *ke*, the root choice *i* indicates there is an ergative and a dative controlling agreement morphology, and the realization of the morpheme *en* is potentially sensitive to most other factors in the agreement complex (see below for glosses).

(10)	Zuek$_i$	guri$_j$	ardiak$_k$	emango	z$_i$-en-i-zki$_k$-gu$_j$-ke-te$_i$-n
	you.PL.ERG	us.DAT	sheep.PL.ABS	give.FUT	2-THM-$\sqrt{3V}$-PL-1PL-POT-PL′-PST

“You(PL) would have given the sheep to us.”

Little needs to be set out here of the details of Basque agreement morphology. Lucid overviews for the literary dialects can be found in Lafon (1954, 1955, 1961), Laka (1993b), Gómez and Sainz (1995), Albizu (2002), and more extensive syntheses for example in Azkue (1923, 1924, 1925), Lafon (1944), Lafitte (1979), Yrizar (1981). In each example, I use coindexing to show the relationship between agreement controllers (indicated by *pro* if necessary) and their corresponding agreement morphology.

The property of the complex important here is that the agreement which is canonically controlled by the absolutive argument is very clearly distinguished from that controlled by ergative and dative. It is possible to speak of canonical control because outside of well-defined “agreement displacements”, there are consistent controller–morpheme type correlations. A partial resume is given in Table 4.2, where for a selection of the positions found in (10), their various potential controllers are indicated. The discussion here will revolve mostly around *prefix* and *plural* (PL, not PL′ in Table 4.2) agreement, canonically controlled by the absolutive, and *suffix* agreement, canonically controlled by the person of the dative and ergative (their number is indicated separately by the special PL′ morpheme with other functions as well).

The canonically absolutive agreement consists of the prefix and plural fields. The prefix, *z* in these examples, is controlled by first/second person arguments, never third, and filled by a tense/mood-conditioned default otherwise, glossed DFLT. The plural field, glossed PL, exemplified by *zki*, is

TABLE 4.2 Basque agreement complex

z prefix	*en* THM	*i* $\sqrt{\text{root}}$	*zki* PL	*gu* suffix	*ke* mood	*te* PL′	*n* tense
1SG.ABS		$\sqrt{1V}$: ABS	1PL.ABS	1SG.ERG/DAT		3PL.ERG/DAT	
1PL.ABS		$\sqrt{1'V}$: ABS, DAT	2PL.ABS	1PL.ERG/DAT			
2PL.ABS		$\sqrt{2V}$: ERG, ABS	3PL.ABS	2PL.ERG/DAT			
		$\sqrt{3V}$: ERG, DAT, ABS		3SG/PL.DAT			

controlled by plurals. Ergative and dative person control the suffix field (e.g., *gu*), one suffix each. Third person ergative and absolutive lack person morphology, and, it seems, any person feature as well; the dative has both, and it is this that is indicated by the gloss "3". Most often, the agreement complex is built around an auxiliary root. The choice of the auxiliary partially indicates the Case of agreement controllers, from one perspective, or valued φ-probes, from another (Rebuschi 1984, Albizu 2002). Thus a form such as *d-u*, glossed DFLT-$\sqrt{2V}$, though it has nothing but a default prefix and the root, nevertheless indicates the presence of a third person ergative through the choice of the ergative-indicating root glossed $\sqrt{2V}$.

The preceding sentence explains the glosses $\sqrt{1V}$, $\sqrt{1'V}$, $\sqrt{2V}$, $\sqrt{3V}$; a root that does not indicate more information or where it is irrelevant is glossed simply $\sqrt{}$. The only gloss for mood is POT for potential, and for tense PST for past. THM, "theme marker", is not relevant here. The φ-features indicated in the glosses are the following: 1SG, first person singular, 1PL first person plural; 2, second person; PL/PL′, plural (according to morpheme).[4]

Syntactically, Basque is thoroughly nominative–accusative, grouping S and A against O for such diagnostics as scope, binding, and control (Ortiz de Urbina 1989). I follow the analyses of Basque-like morphological ergativity proposed in Bobaljik (1993), Laka (1993a, 2000), Fernández (2001), Fernández

[4] The glosses indicate morphological features. The plurality of 1st/2nd person pronouns is morphological, like 3SG *on* "we" and 2PL *vous* "you (singular, respectful)" in French. In Basque, 2PL is 2nd person singular respectful, and the interpretively plural version is "sur-plural", made from it by adding an extra morpheme (PL2, otherwise used for 3PL). The person distinctions among 1st person are also morphological, as in French 3SG *on* "we" vs. 1PL *nous* "we": 1 is 1st person singular, 1′ is first person plural, and while these are often distinguished by morphological plurality as well, they need not be, as in the dialect of Oñate that will come up below. In this chapter I set completely aside all forms containing 2nd person familiar, which along with forms containing "allocutive agreement" belong to a different register, with somewhat different morphological patterns, e.g., affix ordering, greater/lesser presence of agreement displacement phenomena, etc.; cf. Gómez and Sainz (1995: 247). See Řezáč (2006) for details on these matters.

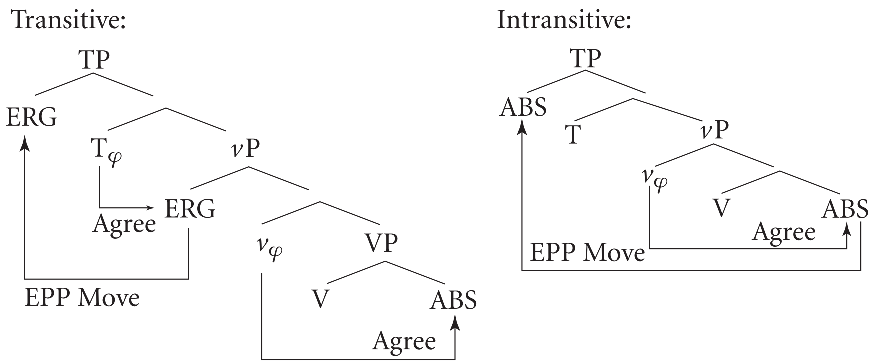

FIGURE 4.2 Agree and EPP in Basque simple transitives and intransitives

and Albizu (2000), Řezáč (2003); see Figure 4.2. The Case/Agree locus of the absolutive is *v*, that of ergative, T. The highest argument obtains subjecthood through moving to the specifier of TP to satisfy the EPP. The Obligatory Case Parameter setting for Basque ensures that *v* is the primary locus of Case/Agree, and T the secondary one; the limited form adopted here accommodates raising-to-ergative discussed below.

(11) Basque syntax

  (i) T: has a φ-probe which assigns ergative to its goal

  (ii) *v*: has a φ-probe which assigns absolutive to its goal

  (iii) *Obligatory Case Parameter*: *v* must have a φ-probe if its V selects an argument that requires structural Case licensing

The *v*-setting of the Obligatory Case Parameter makes unavailable an absolutive/ergative alternation such as the T-setting in accusative languages allows across the active–passive divide, for *v* will always be the internal argument Case/Agree locus whether there is an external argument or not. Nevertheless, it can be demonstrated that ergative and absolutive pattern together as structural Case while the dative is set apart as theta-related.

The strongest evidence for the structural status of ergative and absolutive are raising constructions, as demonstrated by Artiagoitia (2001a,b). A full exposition is out of place here; yet the consequences can be reviewed by walking through examples of the different structures available. (12a) shows raising to absolutive. The matrix *seem* verb selects a small clause complement and a dative experiencer; the subject of the small clause raises to get absolutive case and trigger absolutive-type agreement in the matrix clause. In the remaining examples, a lexically distinct *seem* verb agrees using ergative-type agreement, that is, agreement controlled outside raising contexts only by DPs with ergative case, and if actual raising occurs, the raised DP bears ergative case morphology. (12b) is a close variant of (12a) with these properties.

(12) a. Niri Jon [t_i ergela] iruditzen zai-t$_j$.
me.DAT Jon.ABS fool seeming $\sqrt{1'V}$-1
"Jon seems a fool to me." (Artiagoitia 2001a: ex. 35a)

b. Zuk$_i$ [t_i zintzoa] d-irudi-zu$_i$
you.ERG honest DFLT-$\sqrt{\text{seem}}$-2
"You seem honest". (Artiagoitia 2001a: example 7, partial)

c. *pro*$_i$ [zu$_j$ nekatuta z$_j$-a-u-de$_j$-la] ematen d-u
3SG.ERG you.ABS tired 2-THM-$\sqrt{\text{rest}}$-PL$'$-that seeming DFLT-$\sqrt{2V}$
"It seems that you are tired." (Artiagoitia 2001a: example 48a)

d. ...dantzariek$_i$ [*pro*$_j$ prozesio batean d-a-bil-tza$_j$-la] d-irudi-te$_i$
dancers.ERG 3PL.ABS procession one.in DFLT-THM-$\sqrt{\text{walk}}$-PL-that DFLT-$\sqrt{\text{seem}}$-PL$'$
"The dancers seem like they go in a procession."
(Artiagoitia 2001b: example 60, partial)

The next two examples use finite, agreeing complements. In (12c) no raising or long distance agreement occurs; however, the matrix choice of auxiliary root, $\sqrt{2V}$ *u*, clearly indicates that beside the clausal complement, there must be a 3SG ergative argument, an expletive corresponding to English pro-CP *it*. (12d) is a copy-raising construction. The matrix non-thematic position is filled by an ergative argument that triggers ergative-type agreement in the matrix clause, and is interpreted as the subject of the clausal complement. Numerous diagnostics demonstrate that copy-raising of this type is not a thematic use of *seem* verbs, but rather the linking of a matrix non-thematic position to the embedded subject by a process with the locality properties of φ-Agree; beside Artiagoitia's work on Basque, see Potsdam and Runner (2001) and Řezáč (2004: chapter 3) for overviews.

These constructions show the existence of ergative expletives, and ergative and absolutive assigned to non-thematic positions. By contrast, dative and dative-type agreement are never the target of these processes, so there is no raising to dative, and no dative-type agreement with non-thematic DPs. So the dative, but not the ergative or absolutive, is tied to theta-assignment. It is theta-related; they are structural.

An independent verification of the grouping ergative + absolutive vs. dative is to be found in a phenomenon known as *ergative displacement* (Laka 1993b, Gómez and Sainz 1995, Albizu and Eguren 2000, Fernández and Albizu 2000, Fernández 2001, Řezáč 2003, 2006). In the nonpresent tense, a first/second person ergative controls absolutive-type rather than or in addition to ergative-type person agreement morphology, provided that the absolutive is third person (1/2 > 3 combinations). Most accounts turn on Laka's (1993) proposal that third person is underspecified for the property that allows first/second person to control person agreement, such as being [participant], suggested by the lack of third person agreement morphology for ergatives and absolutives. Remarkably, the dative is completely invisible to this process, although in terms of c-command the dative argument is between the ergative and absolutive (see Section 4.4), and its agreement morphology is identical with and linearly closer to the prefix than the position of the canonical ergative morphology. Yet the ergative must displace over it, (13b), and if there is no first/second person ergative or absolutive, the dative itself cannot control the prefix agreement, (13c).

(13) ERGATIVE DISPLACEMENT IN DITRANSITIVES IGNORES DATIVE

a. Guk$_i$ zuri$_j$ sagarrak$_k$ erosi **d**-i-zki$_k$-zu$_j$-gu$_i$
we.ERG you.DAT apples.ABS bought DFLT-$\sqrt{3V}$-PL-2-1PL
"We have bought you the apples."
(present; no ergative displacement)

b. Guk$_i$ zuri$_j$ sagarrak$_k$ erosi ***g****$_i$*-en-i-zki$_k$-zu$_j$-(gu$_i$)-n
we.ERG you.DAT apples.ABS bought 1PL-THM-$\sqrt{3V}$-PL-2-(1PL)-PST
"We had bought you the apples." (past; ergative displacement)

c. Elodik$_i$ zuri$_j$ sagarrak$_k$ erosi **z**-i-zki$_k$-zu$_j$-n
Elodi.ERG you.DAT apples.ABS bought DFLT-$\sqrt{3V}$-PL-2-PST
"Elodi had bought you the apples."
(past; no goal for ergative displacement)

Ergative displacement has been argued to involve valuation of the person φ-probe of *v* from the ergative when there is no absolutive with person features, and it is this φ-probe that is spelled out by the prefix morphology of the agreement complex (Laka 1993b (arguably, modulo framework change), Fernández 2001, Fernández and Albizu 2000, Řezáč 2003, 2006). The dative is not visible to this φ-probe. It behaves in the manner of theta-related Case, cloaked to φ-probe valuation by Case Opacity, while ergative and absolutive are visible to it, in the manner of structural Case.

4.4 Standard Basque dative agreement: Quirky Case cliticization

The Basque agreement complex includes dative agreement morphology in the suffix field (Lafon 1961). Such agreeing datives are always in the applicative construction, studied by Elordieta (2001). The most relevant property is that the c-command among A-positions in transitive applicatives is *ergative* > *dative* > *absolutive*. The results may be extended to dative-absolutive psych-verbs, though in these the absolutive eventually attains an EPP-related A-position above the dative (Řezáč 2007). The preceding section has shown that the dative is theta-related Case, hence a PP, and one that cannot value a φ-probe, unlike absolutive and ergative, in accordance with Case Opacity. The resulting structure has the dative PP in the specifier of ApplP between *v* and VP, as in Figure 4.3.

This leaves the question of what dative agreement is in Basque. A preliminary indication is that Basque datives show a typical "quirky" Case interference for person φ-Agree known as the Person Case Constraint and discussed in Section 4.8 (Albizu 1997). This suggests an analysis of dative agreement morphology in terms of quirky displacement, as that of Anagnostopoulou for Greek and Romance dative clitics reviewed in Section 4.2. The proposal receives strong support from the following generalization (Řezáč 2004: 84ff.):

(14) DATIVE DEPENDENCY GENERALIZATION
Dative agreement morphology controlled by dative DP is contingent on φ-Agree with an absolutive DP in the same clause.

The correct interpretation of (14), I suggest, is that dative agreement morphology comes about through quirky displacement of a dative X^0 between *v* and the absolutive goal of *v*'s φ-probe, as in Figure 4.3. The φ-probe of *v* enters into a non-valuing relation with the quirky Case dative, displaces a D-like head (alone or part of a larger DP), and then continues to Agree with the next lower DP to which it assigns absolutive. If there is no φ-probe on *v*, nothing will bring dative agreement morphology to *v*. If there is a φ-probe on *v*, there must ordinarily be an absolutive argument to serve as its associate, giving (14). As with quirky displacement, it is the contingency of one type of agreement on another that suggests the same φ-probe is responsible for both, though it is only valued from the DP without theta-related Case.

The dative dependency generalization cannot be investigated on the basis of simple predicates. Basque as many other languages has unergatives with only a dative object, like *jardun* "continue", but these have a (typically) covert theme argument corresponding to the absolutive (Laka 1993b, 2000; cf. Hale and Keyser 1993, Dobrovie-Sorin 1998). However, complex predicate and raising

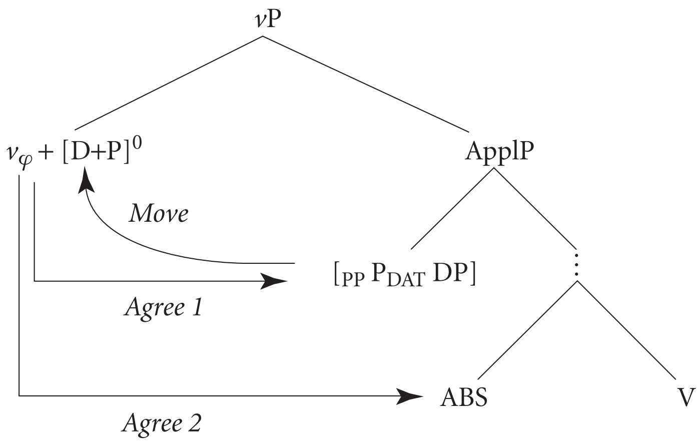

FIGURE 4.3 Standard Basque dative agreement

constructions can be so constructed that no potential goal for *v*'s probe is present. From them, the generalization can be established, on the basis of observation due to Artiagoitia (2001a,b) and Albizu and Fernández (2002). For reasons of space, I must refer the reader to Řezáč (2004: 84ff., 2006) for restructuring constructions, and keep here to the swifter, more pertinent argument from raising.

The constructions in question are those involving the (copy-)raising-to-ergative verbs meaning "seem", already used to illustrate the structural nature of ergative and absolutive (Section 4.3). Here there is no absolutive goal for the *seem* verb, and no φ-probe on *v*; there is only an ergative-assigning T φ-probe that Agrees either with a 3SG.ERG expletive, or with the highest DP in the lower CP. The dative dependency generalization surfaces when a dative experiencer argument is added to the *seem* verb, something that Artiagoitia (2001a,b) demonstrates should be possible thematically, yet is not (15a). The only way to have a dative experiencer with a *seem* verb is to use the related but distinct raising verb, a dative-absolutive psych-verb *iruditu* "seem to (think, consider)", as in (15b), which does have an absolutive DP goal valuing a φ-probe on *v*.

(15) a. *Jon(ek) nekatuta z-e-go-ela iruditu
John(.ERG) tired DFLT-THM-$\sqrt{\text{rest}}$-that seemed
z-i-da$_i$-n *pro$_i$*
DFLT-$\sqrt{1'\text{V}}$-1-PST 1SG.DAT
"John/it seemed to me that he was tired."
(Artiagoitia 2001a, Albizu and Fernández 2002)

b. ...neguak$_i$ uda... iduritzen bait-zai-zki$_i$-gu$_j$ *pro*$_j$
winters.ABS summer.ABS seeming that-$\sqrt{1V}$-PL-1PL 1PL.DAT
"...winters seem to us summer, nights day,..."
(Pedro de Axular, *Gero*, §319)

This pattern is predicted by the dative dependency generalization (14). The dative experiencer of *seem* can control dative agreement just in case the matrix verb also has a φ-probe on v and there is a goal for it (a DP that raises, copy-raises, etc.). A φ-probe cannot be gratuitously present on v with no goal to value it (cf. Lasnik 1999: chapters 4, 6, Bošković 1997: 134, Chomsky 2000: 125–7). If there is no such goal, there is no φ-probe on v, and dative agreement cannot appear either.[5]

The occurrence of the dative dependency generalization in raising construction is particularly telling, for it cannot have its source in any direct, local dependence of the dative on the lower object, as in Pylkkänen's (2003) approach to low applicatives where the applied object is the theme's specifier. It is explained by applying Anagnostopoulou's (2003) approach to dative clitics to Basque dative agreement. A dative cannot itself value a φ-probe, so it does not license a φ-probe on v. Only if another DP is around to do so, and v thus has a φ-probe, can dative morphology arise, through quirky displacement of an X^0 from the dative between v and its goal. It remains to be explored whether the idea can prove useful for restrictions on applicatives and causatives as well, where the same dependence of a dative on a lower DP is found.

So far, Basque datives fit Case Opacity: the Case is not structural but always theta-related, and it cannot value a φ-probe. However, there turn out to be dialects where datives do value φ-Agree.

4.5 Agreeing datives in Basque: Dative displacement

The preceding section has discussed datives as they are in most dialects, including the Unified Basque standard and the literary varieties. However, in

[5] Since there is φ-Agree between the T of the *seem* verb and a lower DP within its CP argument, one might expect this φ-Agree to license the dative experiencer agreement morphology that lies in between by quirky displacement, incorrectly. For independent reasons, I propose in Řezáč (2006) that the CP argument of *seem* verbs is in fact base-generated in the specifier of vP, so the dative experiencer is below it, and not on the T–CP φ-Agree path. Alternatives explored there (and perhaps more palatable) would be a difference in the ability of the φ-probes of T and v to effectuate quirky displacement, or to provide a landing site for the displaced D^0. In fact both turn out to be independently plausible for Basque: e.g., the φ-probe of v but not T shows evidence of separate person and number components (Řezáč 2006).

some dialects first/second person datives behave very differently. They agree in the fashion of the absolutive, as illustrated in (16), controlling the prefix (bold) and plural (small caps) agreement, which spell out the φ-probe of *v*. Remarkably, such datives retain their theta-related dative case. The phenomenon is called *dative displacement* (I abbreviate DL), and it shows the possibility of φ-Agree with a DP that bears theta-related Case morphology.[6] Outside DL contexts, the behavior of absolutives and ergatives, for agreement, ergative displacement, raising, and so on, is the same in these dialects as in those described up to now; for example absolutives control prefix and plural morphology.

(16) *v*-agreement with datives (Hondarribia dialect) [*standard*]

a.
Zuk$_i$ niri$_j$ sagarra$_k$ eman **n**$_j$-a-u-zu$_i$ [**d**-i-da$_j$-zu$_i$]
you.ERG me.DAT apple.ABS given 1-THM-√-2 DFLT-√-1-2
"You gave me the apple." (ditransitive; Fernández 2004: 97)

b.
Zuk$_i$ guri$_j$ sagarra$_k$ eman **g**$_j$-a-TT$_j$-u-zu$_i$ [**d**-i-**gu**$_j$-zu$_i$]
you.ERG us.DAT apple.ABS given 1PL-THM-PL-√-2 DFLT-√-1PL-2
"You gave us the apples." (ditransitive; Fernández 2004: 97)

[6] The name *dative displacement* (*datiboaren lekualdatzea*) is due to Fernández (2001: 147). DL is well known to traditional descriptions since the first comparative work on Basque dialects in the early eighteenth century (Sagarzazu 1994 gives an extensive overview), a staple of brief remarks or interdictions in general and comparative grammars (e.g. Azkue 1924: 539/§770, 576/§810; Lafitte 1979: 296/§577), discussed in recent grammars of particular dialects (e.g. Hualde et al. 1994: 125ff., Fraile and Fraile 1996: 111ff., Agirretxe et al. 1998: 122f.), and the subject of Yrizar's (1981: 359ff.; 1997: 17ff.) lucid overviews. Finally, it has recently been explored in the generative framework by Fernández (2001, 2002, 2004), Fernández and Ezeizabarrena (2001). The theory presented in these works is very different from what will be explored below, for it begins with a view of agreeing datives in DL and non-DL dialects alike as akin to agreeing absolutives and ergatives, so the issue of Case Opacity does not arise. Yet these works are at the same time the source of many of the core generalizations and guidelines for a generative analysis of dative displacement; among which the most salient here is the very fact that the dative controls the φ-probe of *v*, as absolutive canonically, and as ergative under "ergative displacement." My discussion here is derived from Řezáč (2006), which is based empirically on a study of the dialects (about fifty) with some DL, most compiled by Pedro de Yrizar (e.g. in Yrizar 1997). Issues of dative displacement that do not bear directly on Case Opacity are discussed there.

c. Ni-ri$_i$ sagarr-a$_j$ gustatzen **n**$_i$-a-u [Ø-zai-**t**$_i$]
me DAT apple ABS pleasing 1-THM-√ DFLT-√-1
"I like apples." (psych-verb; Fernández 2004: 99)

Dative displacement seems to change φ-probe–controller pairings for *v*, without concomitant change in case morphology (Fernández 2001), applicative structure, or hierarchical relations (see below). However, there is a syntactic effect, and it is one predicted by the dative dependency generalization (14) in Section 4.4. The generalization states that a canonical agreeing dative is contingent on a φ-Agree relationship between *v* and a lower goal, which brings the dative's D(+P)^0 into the agreement complex through quirky displacement. An example was the impossibility of adding a dative experiencer to a raising-to-ergative *seem* verb in (17a), since its *v*'s φ-probe has no goal; the closest lower DP capable of valuing it, *haiek*, Agrees with the matrix T's φ-probe, controlling the PL′ morpheme *te*. Adding a dative experiencer is only possible with another *seem* verb (in this dialect, homophonous) in (17b), a raising-to-absolutive one, where *haiek* Agrees with *v*'s φ-probe, controlling the plural morpheme *zki*. However, the generalization also predicts that the dative in dative displacement, which actually values *v*'s φ-probe like a regular absolutive, has no such dependency on a separate *v*-absolutive relationship, for it is itself the valuing goal of *v*'s φ-probe. This is correct, as (17c) indicates.

(17) a. ?*Haiek$_i$ nekatuta z-e-u-de$_i$-la iruditu
they.ERG tired DFLT-THM-√be-PL-that seemed
z-i-da$_j$-te$_i$-n (neri$_j$)
DFLT-√-1-PL′-PST me.DAT

b. ?Haiek$_i$ nekatuta z-e-u-de$_i$-la iruditu
they.ERG tired DFLT-THM-√be-PL-that seemed
z-itzai-zki$_i$-da$_j$-n (neri$_j$)
DFLT-√-PL-1-PST me.DAT

c. ?Haiek$_i$ nekatuta z-e-u-de$_i$-la iruditu
they.ERG tired DFLT-THM-√be-PL-that seemed
n$_j$-a-u-te$_i$-n (neri$_j$)
1-THM-√-PL′-PST me.DAT
"They seemed to me like they were tired." (Aritz Irurtzun, p.c.)

TABLE 4.3 Past ERG > DAT > 3SG = ERG > ABS paradigm in Sara

DAT	3SG.ERG	3PL.ERG	1SG.ERG	1PL.ERG	2PL.ERG
1SG	**n**-ind-u-en	**n**-ind-u-te-n	–	–	**n**-ind-u-zu-n
1PL	**g**-in-T-u-en	**g**-in-T-u-zte-n	–	–	**g**-in-T-u-tzu-n
2PL	z-in-T-u-en	z-in-T-u-zte-n	z-in-T-u-ta-n	z-in-T-u-u-n	–

Labourdin group, variety Sara: Yrizar (1997: 45ff., s.v. Artola).

The syntax proposed to underlie DL is constrained by the need to resemble non-DL enough so that the DP controlling absolutive-like agreement be interpreted as the applied object and bear dative case. Indeed, there does not seem to be any difference in the clausal architecture for DL and non-DL datives, only in the transparency of the dative to φ-Agree. This is the assumption of Fernández (2001). Positive evidence can be had from the morphology.

In (16), the dative goal controls both prefix and plural agreement morphology, reflecting the φ-probe of *v*, just like an absolutive goal does. Indeed, the agreement complex in, say, (16b) is the same as the one that would be used in that dialect if the dative were replaced by an absolutive with corresponding φ-features (*gu*), *sagarra* "apple" were removed, and a simple transitive verb (participle) like *ikusi* "seen" replaced *eman*, giving *Zuk gu ikusi gattuzu* "you saw us". This ambiguity of the agreement complex is not a necessary concomitant of DL. It is found in dialects like Lekeitio or Sara. The Sara forms given in Table 4.3 are (virtually) the same for simple transitive α ergative > β absolutive combinations, and for α ergative > β dative > 3SG ditransitive combinations. Keeping to the relevant essentials, the structure of the forms is prefix (underlined), controlled by the absolutive canonically and by dative under DL, the theme marker *in(d)* which is not relevant here, plural (small caps) controlled by the same controller as the prefix, after which follow elements again not relevant: the root *u*, the ergative-controlled suffix, and the past tense marker *-n*. Table 4.4 indicates the form of the paradigm in a closely related dialect without DL: the prefix is the past tense default *z*, and the dative controls only suffixal morphology (italicized) as 1SG *ta*, 1PL *ku*, 2PL *tzu*.[7]

Quite different is the relationship of transitive and DL ditransitive paradigms in dialects like Oñate, which has DL for first person datives, not for second person ones (see further Section 4.6). In the transitive paradigm,

[7] Zeros justified by the rest of the paradigm are indicated by Ø. Forms not given are so for practical reasons only, not because they show a different pattern: they would require a digression into "ergative displacement".

TABLE 4.4 Past ERG > DAT > 3SG paradigm in Urdax

DAT	3SG.ERG	3PL.ERG
1SG	z-a-u-*ta*-n	z-a-Ø-*ta*-te-n
1PL	z-a-(u)-*ku*-n	z-a-(u)-*ku*-te-n
2PL	z-a-Ø-*tzu*-n	z-a-Ø-*tzu*-te-n

Labourdin group, variety Sara: Yrizar (1997: 169ff., s.v. Taberna).

Table 4.5, a first/second person absolutive controls the prefix morphology; in this dialect first and second person are never morphologically [plural], but otherwise the paradigm corresponds closely to that of Sara. The ditransitive paradigm (Table 4.6) is very different. Ignoring for the moment the boldface prefix, the rest of the structure consists of the root *o*, reserved for ditransitives, followed by the "dative flag" *s/Ø* (**tz*), which is a sign of applicatives in Basque (perhaps the very head Appl^0, Elordieta 2001: 62), followed by the canonical suffixal agreement (italicized) controlled by the dative, followed by irrelevant ergative-controlled and past morphology. Still ignoring the prefix, these forms are simply the expected forms without DL, with the hallmark morphology of applicative constructions, including suffixal morphology that comes from the dative due to quirky displacement. For second person datives, the story stops here; the prefix is the past default, Ø in this dialect. For first person datives, however, the prefixal morphology is controlled by the dative *in addition to* the canonical suffixal morphology: thence the prefixes *n* and *g*, realizing the φ-probe of *v*. For these datives, dative displacement occurs.

The Oñate paradigm reflects rather straightforwardly the underlying applicative syntax of dative displacement. This yields the distinctive applicative characteristics such as the dative flag and ditransitive root. Labourdin

TABLE 4.5 Past ERG > ABS paradigm in Oñate

ABC	3SG.ERG	3PL.ERG	1SG.ERG	1PL.ERG	2PL.ERG
1SG	**n**-iñd-u-n	**n**-iñd-u-e-n	–	–	**n**-iñd-u-su-n
1PL	**g**-iñd-u-an	**g**-iñd-u-e-n	–	–	**g**-iñd-u-su-n
2PL	**s**-iñd-u-n	**s**-iñd-u-ai-ñ	**s**-iñd-u-a-n	**s**-iñd-u-gu-n	–

Bizkaian group, variety Vergara: Yrizar (1992: 455ff., s.v. Otarola).

TABLE 4.6 Past ERG > DAT > 3SG/PL paradigm in Oñate

DAT	3SG.ERG	3PL.ERG	1SG.ERG	1PL.ERG	2PL.ERG
1SG	**n**-o-s-*ta*-n	n-o-s-*ta*-i-ñ	–	–	**n**-o-s-*ta*-tzu-n
1PL	**g**-o-s-*ku*-n	g-o-s-*ku*-e-n/iñ*	–	–	**g**-o-s-*ku*-tzu-n
2PL	**Ø**-o-Ø-*tzu*-n	**Ø**-o-Ø-*tzu*-e-n	**n**-o-*tzu*-n†	**g**-o-*tzu*-n†	–

Bizkaian group, variety Vergara: Yrizar (1992: 455ff., s.v. Otarola).

* non-DL variant *oskue-n/iñ?*

† Ergative displacement has taken place, so the ergative controls the boldface prefix.

dialects like Sara/Urdax differ in that even when there is no DL, the transitive and ditransitive paradigms are not strongly differentiated in their formation, the root for example being the same *u*.[8]

Oñate also shows the suffixal morphology canonical for the dative, doubling the dative-controlled prefix. Sara-type dialects also can have such morphology (cf. Fernández 2002). The possibility of this doubling is predicted. When DL occurs, the dative values the φ-probe of v under Agree; however, nothing should prevent it from undergoing at the same time X^0-movement to yield suffixal morphology. This is to be compared to other cases where φ-Agree and X^0 (clitic) doubling of a DP combine, such as complementizer φ-agreement + subject clitic doubling in (18) (see Section 4.6).

(18) da-n$_i$-k$_i$ ik$_i$ komm-en
that-1SG-I(clitic) I.NOM come-1SG (West Flemish; Zwart 1997: 138)

To the evidence of morphology may be added that there are datives that require the applicative construction in Basque, even for speakers who can realize datives alternatively using a nonapplicative, nonagreeing dative that corresponds to the prepositional *to* construction in English (cf. Joppen and Wunderlich 1995). Among such datives are experiencers of psych-verbs like *iruditu*, which may undergo dative displacement as already shown in (17c), and agent causees, shown with dative displacement (doubled by dative flag and suffixal morphology) in (19) (for this one example, I use the gloss 2F for second person familiar, cf. note 4).

(19) Eman arazi n-a-u-ta-k
given cause 1-THM-√-1DAT-2F
"You made me give it to him." (Trask 1981: 294)

[8] These have arguably spread both DL and the specific mode of formation to neighboring dialects that do differentiate the transitive and ditransitive root, like Pasaia Donibane in Section 4.7.

Dative displacement clearly shows datives that control absolutive φ-Agree using the same system and producing the same result as absolutives, and yet remain datives. This contrasts directly with quirky datives that are only visible to the φ-Agree system as nonvaluing DPs, though through quirky displacement they control a different kind of agreement morphology. The two sometimes coexist for different datives in the same dialect (cf. Section 4.7), and sometimes they cooccur in the same form, as in Oñate. Case Opacity is incorrect. The pieces are in place now for a theory of theta-related Case, its normal opacity and its marked transparency to φ-Agree, and some of the expected loci of parametric variation.

4.6 Structural and theta-related Case

In this section I will develop a theory of theta-related Case and its interaction with φ-Agree. The foundation lies in understanding theta-related Case as a PP shell around a DP, or more generally, as some XP that contains the DP. PPs are the natural choice adopted in Section 4.1, and they have an independently justified property that is crucial here: they are known to be opaque domains to narrow-syntactic dependencies, such as *wh*-movement. In current parlance, PPs are phases. It follows that a DP within a PP is not visible to φ-Agree outside the PP. Normally, theta-related Case is a barrier to φ-Agree, deriving Case Opacity from the general opacity of PPs.

However, the opacity of an XP depends on its head X, and properties of X can modulate it, for example by permitting successive-cyclic movement. I will take advantage of this to modulate the opacity of PPs to external φ-Agree. Specifically, exploiting the PP–CP parallelism hypothesis, I suggest P may itself have a φ-probe that Agrees with the DP within it, in the same way that C is known to allow a φ-probe that Agrees with a nominative DP in its complement. The result of this P–DP φ-Agree is visible to φ-Agree from the outside; effectively, a φ-probe on P transmits the φ-features of its DP complement to the outside of the opaque PP domain. The presence of a φ-probe on P thus makes the PP seem transparent. However, the transparency is derived, and it is the probe on P and its content that determine what P Agrees for with the DP, and thus how the DP's φ-features are transmitted to the outside world.

The following are the core theoretical elements more explicitly:

(20) a. DPs with structural Case are just DPs, with their interpretable φ-features on D(P)

b. DPs with theta-related Case are contained within PPs, where P is a phase-head

c. The P-head of a PP is susceptible to variation in the presence and content of a φ-probe

The φ-features of bare DPs are visible to φ-Agree from the outside; if they are the arguments of a clause, then to clausal φ-Agree. However, a DP within a PP is in an opaque domain, one that is typically a barrier to the Case/Agree, A-movement, and Ā-movement. Abels (2003), building on van Riemsdijk (1978), proposes that PPs are phases in the sense of Chomsky (2000, 2001):[9]

(21) Phase: ... $[_{XP} \ldots X \boxed{[_{YP} \ldots]}\ ]$ (*boxed domain opaque outside XP*)

A *phase* is an XP, for some X, that constitutes a barrier for narrow-syntactic dependencies between the complement YP of X and the larger context containing X. X and the specifier of XP are not contained within this barrier; they are said to be at the *edge* of the phase. Consequently, properties of X, such as a trigger for movement to the specifier of XP from within the complement of X, can circumvent the barrierhood of XP for YP. If PP is a phase, a DP that is (within) the complement of P is invisible outside the PP. Since theta-related Case is a PP, a DP within it just like a DP within any PP is invisible to an external φ-probe.

Making a PP a phase is a stipulation, since it cannot be said that there is a widely accepted explanatory theory of which domains are phases and why. However, the fact that PPs are opaque domains, though ones that may be selectively unlocked, is solidly grounded (see the references above). The eventual minimalist goal is to understand why this should be so, for example along the lines of Uriagereka (1999a,b), who argues that certain domains are opaque because they are subject to spellout motivated by the requirements of the interface, and after spellout syntax sees them as unstructured terminals. Whatever the explanation will be, PPs are opaque domains, and I mean no more than this when I call them phases.

The "escape hatch" for DP's φ-features is a φ-probe on P. The possibility of a φ-probe on P is expected if PP for nominal predicates parallels the CP for verbal predicates, P corresponding to an element high in the CP system, as proposed for example by Cardinaletti and Starke (1999: 183ff.), Kayne (2000: chapters 14, 15). It is a familiar and parametrically varying property of C that it can agree with the clausal subject, which may independently agree with (T+) the verb. One example is complementizer agreement in West Germanic dialects (recent overviews: Zwart 1997: 136ff., 256ff., Hoekstra and Smits 1998,

[9] Abels establishes a generalization that the extraction of the object of a P is only possible if movement through the edge of the PP phase is possible. That in turn depends on whether there is an extra category between P and the extractee, because the movement of the complement of H to the specifier of H is impossible.

de Vogelaer et al. 2002, Carstens 2003, van Koppen 2005), such as *n* on *da* in (22).

(22) Kpeinzen [da-**n**$_i$-k$_i$ ik$_i$ morgen goa-n$_i$]
think.1SG that-1SG-I(clitic) I.NOM tomorrow go-1SG
"I think that I will go tomorrow."
(Lapscheure (West Flanders); de Vogelaer et al. 2002)

It has been proposed that the complementizer agreement morphology, in (22) *n* distinct from the subject doubling clitic *k*, is the result of φ-Agree by C (Carstens 2003). This is effectively demonstrated by van Koppen (2005). She shows that nominative subjects which do not uniquely determine the value of a φ-probe, such as conjoined DPs, may control different agreement values on T and C. In (23), C agreement is with the left conjunct, while T agreement must be with the whole conjunct; the dichotomy is an instance of the commonplace left-conjunct agreement option for following conjuncts versus full-conjunct agreement requirement for preceding conjuncts. Two independent φ-probes Agreeing with the nominative, one on C and one on T, correctly predict this, while a single φ-probe and feature-sharing between T and C (Zwart 1997, 2001) does not.

(23) ...daß-sd$_i$/ds$_j$ [du$_i$ und d'Maria]$_j$ an Hauptpreis gwunna
that-2SG/PL you(SG) and the Maria the first prize won
hab-ds$_j$
have-2PL
"That Maria and you have won the first prize."
(Bavarian; van Koppen 2005: 43)

Extending a φ-probe to the P head of PPs is expected under PP–CP parallelism (cf. agreeing Ps in Section 4.9). Together with the phasehood of PPs, it designs the picture in (24). PP and CP are opaque domains, and the complement of P and C can only be rendered visible to external processes through P/C φ-Agree, or through movement to the specifier of PP/CP. I discuss C-Agree as a mechanism to render visible the φ-features of the nominative subject to φ-Agree in a higher clause in Řezáč (2004: chapter 3); from now on I will keep to PPs.

(24) a. $[_{\text{PP}}$ ___ $[\text{P}_{(\varphi=i)}\ \boxed{(\ldots)\ \text{DP}_i}_{\,phase}]]$

b. $[_{\text{CP}}$ ___ $[\text{C}_{(\varphi=i)}\ \boxed{(\ldots)\ [_{\text{TP}}\ \text{DP}_i\ \text{T}_{(\varphi=i)}\ \ldots t_i \ldots\ ]}_{\,phase}]]$

Case Opacity of theta-related Case arises in the unmarked situation, when P lacks a φ-probe. If P has a φ-probe, it is valued from the DP through Agree.

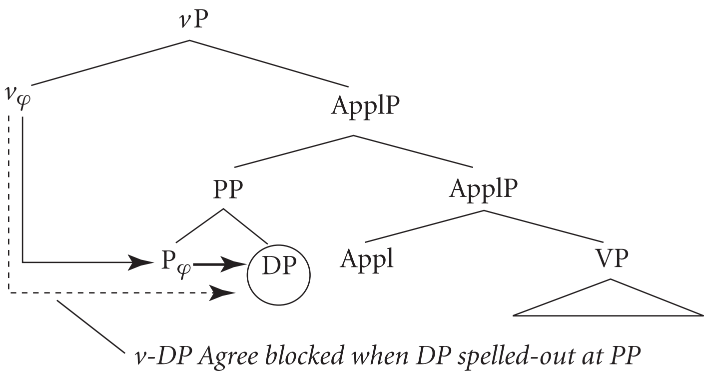

FIGURE 4.4 φ-Agree with a dative PP

This is the option that leads to agreeing datives in Basque dative displacement. If there is a φ-probe, P Agrees with DP, and *v* can Agree with P. In order for this to follow, a higher clausal φ-probe, in Basque that of *v*, must be able to Agree with the Agree-valued φ-probe of the phase-head P. This is expected. Within phase theory, P belongs to the next higher phase, that of *v*, and deletion of its Agree-valued φ-probe has not yet taken place (see further Řezáč 2004: 199ff., Legate 2003; cf. Sigurðsson 1993).

This is the basic mechanism that implements both the normal invisibility of the φ-features of a DP with theta-related Case to external φ-Agree (the opacity of the PP shell), and their manifestly possible but rarer visibility (a φ-probe on the P head). The latter is summarized in Figure 4.4. Agree occurs between *v* and P, and between P and DP. Direct Agree between *v* and the DP is impossible, for by the time *v* would attempt to Agree, the DP is within the (circled) portion of the PP phase that is spelled out upon the completion of the PP.

This derivative status of *v*–DP Agree going through P has as consequence that properties of P should be able to modulate the transparency of the PP. One possibility, parametrization of the "richness" of the φ-probe of P, I will consider in the next section. Here I will end with another: variation among different Ps in a language in the presence versus absence of a φ-probe. Nepali may be an example. Ergative subjects control the same verbal agreement as nominative subjects, but dative subjects do not (Bickel and Yādava 2000, Deo and Sharma 2002):[10]

[10] Brought to my attention by Bobaljik (this volume). See Bickel and Yādava (2000) for identification of the dative and ergative here as analogous to dative and ergative subjects of Hindi-Urdu (Mohanan 1994), that is, subjects with theta-related Case. They argue that in both languages ergative

(25) a. ma yas pasal-mā patrikā kin-ch-u
1SG.NOM DEM.OBL store-LOC newspaper.NOM buy-NPST-1SG
"I buy the newspaper at this store."

b. maile yas pasal-mā patrikā kin-ẽ / *kin-yo
1SG.ERG DEM.OBL store-LOC newspaper.NOM buy-PST.1SG buy-PST.3SG.MASC
"I bought the newspaper at this store."

c. malāī timī man par-ch-au /*par-ch-u
1SG.DAT 2HON.NOM liking occur-NPST-2HON occur-NPST-1SG
"I like you." (Nepali; Bickel and Yādava 2000: 348)

Under the assumption that both ergative and dative subjects, unlike nominative subjects, bear theta-related Case in Nepali, two different Ps are involved, P_{erg} and P_{dat}, selected by *v* and Appl respectively. P_{erg} is transparent to φ-Agree, for it is the ergative external argument, not the nominative (unmarked) internal argument, that in (25b) controls the same verbal agreement as the nominative in (25a). The dative subject in (25c) fails to do so, so P_{dat} creates a PP opaque to external φ-Agree; here it is the nominative internal argument that controls verbal agreement.

4.7 The φ-probe of P

The visibility of the φ-features of a DP within a PP occurs through φ-Agree by the intervening P. One way in which properties of P may modulate the transparency of a PP is through the quality or richness of P's φ-probe. The content of a φ-probe is an independently known point of parametric variation. A typical example is the limitations of agreement on participles in many languages to number and gender, lacking person, in systems where person is available to clausal agreement. Translated to properties of P's φ-probe, it leads to a selective or partial transparency of a PP to external φ-Agree: an external φ-probe will be able to Agree only for what the P has itself Agreed for with the DP. In this manner, one may account for variation in PP transparency based on φ-features, something that does occur in Basque dative displacement.

Section 4.5 has discussed two dialects, those of Sara and Oñate. For neither were third person datives mentioned: indeed, in no Basque dialect do third person datives obviously undergo DL (perhaps they do non-obviously;

and nominative external arguments pass subjecthood diagnostics that the dative experiencer does not, such as being PRO; see Davison (2004) for one explanation.

Table 4.7 DL of 1SG dative–ERG > DAT > 3SG.ABS present in Pasaia Donibane

DAT	3SG.ERG	3PL.ERG	1SG.ERG	1PL.ERG	2PL.ERG
3SG	(di)yo	diote/yote	yot	(di)yo(g)u	(di)yosu
3PL	(di)yote	(di)yote	(di)yotet/di(ot)et	(di)yogu	(di)yosu
1SG	dit, **nau**	**naute**	–	–	diasu, **nasu**
1PL	digu	digute	–	–	digusu
2PL	disu	disute	disut	disugu	–

Gipuzkoan group, variety Hernáni: Agirretxe, Lersundi and Olaetxea (1998: 116f.).

see below). The two dialects also differ in the extent of DL among the remaining datives: all first/second person datives undergo it in Sara, but only first person datives do in Oñate. First persons are particularly favored by DL, with the Oñate pattern recurring in distant dialects whose DL is very different in mode of formation, such as Lekeitio (Hualde et al. 1994: 125–7). Subsets of first person datives also may undergo DL alone: 1SG only in Pasaia Donibane (Table 4.7), and 1PL only in Bacáicoa-Iturmendi (Table 4.8). Table 4.9 illustrates a more heterogeneous situation, where all 1SG and some 2PL datives undergo DL, in the dialect of Arcangues. I do not analyze the agreement complexes in these tables, for the point relevant here is only whether DL occurs or not. This can be read off directly by looking at the initial consonant, the prefix. Either it is the present tense default *d* (sometimes elided), in which case there is no first/second person controller, or it is one of 1SG *n*, 1PL *g*, 2PL *z/s*, in which case the prefix has a dative controller under DL. Such forms are in bold.[11] There are no dialects where a second person dative undergoes DL without a first person dative also doing so.

Some of these tables show a common phenomenon in Basque agreement, not restricted to dative displacement: the existence of gaps to a particular mode of formation, such as DL or non-DL, for a feature combination that is to all appearances fully arbitrary. More familiar analogs are the missing past participle of *stride* in English or the first/second person plural of *frire* “fry” in French. In the ensemble of DL dialects in Řezáč (2006), it turns out that the occurrence of DL depends systematically on the φ-features of the dative,

[11] I keep here to the present of transitives with third person singular rather than plural absolutive object. In none of these dialects do other datives than those given undergo DL, though tense and transitivity play a systematic role in whether they undergo DL in other paradigms in the same dialect (Řezáč 2006).

TABLE 4.8 DL of 1PL dative–ERG > DAT > 3SG.ABS present in Bacáicoa-Iturmendi

DAT	3SG.ERG	3PL.ERG	1SG.ERG	1PL.ERG	2PL.ERG
3SG	da	dai	dat	dau	dazu
3PL	daube	daubei	daubet	daubegu	daubezu
1SG	da	dai	–	–	dazu
1PL	**geru**	**gerubai**	–	–	**geruzu**
2PL	dezu	dezai	dezut	dezû	–

Gipuzkoan group, variety Burunda: Yrizar (1991: 347ff., s.v. Inza).

such as first person in Oñate. On the other hand, the φ-features of other arguments, such as the ergative, never give rise to DL patterns as do those of datives, for example DL (of first/second person datives) for all and only first person ergative. In other words, the φ-features of the dative are unique in conditioning dative displacement *systematically*.

This calls for a mechanism that parametrically modulates a dative's ability to undergo DL, namely its transparency to φ-Agree, based locally on its φ-features, and distinct from the arbitrary gap mechanism which may take into account any properties of the agreement complex. In the remainder of this section, I will suggest that the parametrization mechanism is the portion of the φ-feature geometry of a language that makes up the φ-probe of P. The mechanics depend on specific assumptions about the structure of φ-features and their interaction with the Agree. This should not obscure the more basic conclusions: the transparency of a PP to φ-Agree is systematically decided on the basis of the φ-features of the DP it contains, thus locally to the PP, and if transparency is modeled through the φ-probe of P, then variation of this kind

TABLE 4.9 DL of 1SG + 2SG dative–ERG > DAT > 3SG.ABS present in Arcangues

DAT	3SG.ERG	3PL.ERG	1SG.ERG	1PL.ERG	2PL.ERG
3SG	dio	diote	diot	diou	diozu
3PL	diote	diote	diotet	dioteu	diozute
1SG	daut, **nau**	**naute**	–	–	**nauzu**
1PL	dauku	daukute	–	–	daukuzu
2PL	datzu, **zaitu**	datzute	dautzut, **zaitut**	datzuu	–

Labourdin group, variety Arcangues: Yrizar (1997: 453ff., s.v. Bonaparte).

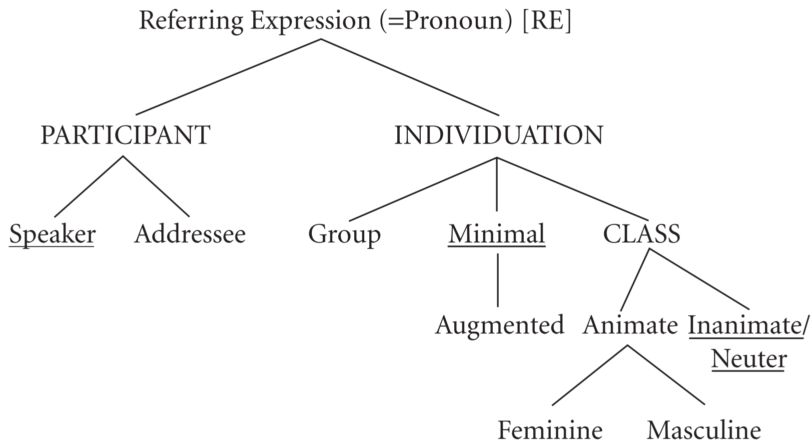

FIGURE 4.5 Universal feature-geometry of Harley and Ritter (2002: 486)
Note: Underlining indicates defaults.

resides most likely in interaction between this φ-probe and the φ-features of the DP that value it.

Béjar (2003) presents a persuasive crosslinguistic argument that not all φ-probes are equal. They vary in their specification, which leads to different sensitivities to potential goals, and thus to differences among φ-probes as to what counts as a valuing goal and/or an intervener. She argues further that constraints on possible φ-probes are partially determined by φ-feature geometry: a φ-probe must be a subtree of the φ-geometry of a language, which is constructed from the universal feature geometry, such as proposed by Harley and Ritter (2002) in Figure 4.5, through choice of active φ-features and default interpretation of underspecified nodes.

One type of φ-probes that Béjar explores using the geometric conceptualization of φ-features are those where the nodes logically dominating a probe in the geometry seem to be truly irrelevant. She proposes (2003: 53) that probe subtrees of the geometry need not be rooted at RE; there are probes such as P = [participant] or P′ = [addressee] that do not contain their dominating nodes. This allows for a probe that looks for [individuation] alone, as participles typically do, or even just for [addressee], and does not see at all DPs that do not have the corresponding node, despite having nodes dominating it like [RE].

Turning concretely to Basque dative displacement, I will assume the φ-specifications in Figure 4.6, giving just the "person" side of things; all third person DPs are further differentiated for number under [individuation], and

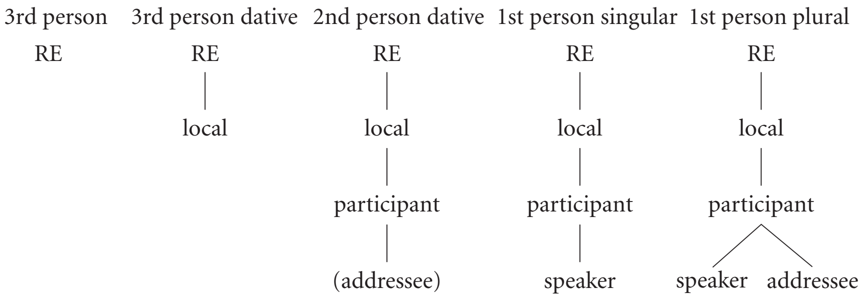

FIGURE 4.6 Basque person specifications

in most dialects first/second person DPs are as well. The first/second versus third person split is given by the presence of the [participant] node, and it is particularly clear in Basque, since only [participants] are capable of valuing the prefixal morphology of the agreement complex, and only [participants] undergo "ergative displacement" (see references in Section 4.3). [participant] does not include third person datives, yet third person datives must be distinguished as "persons" from third person non-datives. In Basque datives are unique in controlling overt third person morphology, while absolutive and ergative arguments never do, and the same kind of split occurs in Itelmen (Bobaljik and Wurmbrand 2001; see ex. (27) here) and Georgian (Anagnostopoulou 2003: 271). I encode this three-way split by introducing the feature [local], one of the options considered by Anagnostopoulou (2003: 271); it corresponds to the [point-of-view] of Boeckx (1999: 366) and [participant] of Adger and Harbour (2007), contrasting for all these authors with a feature grouping first/second person alone, here [participant].

Operating on these feature structures, probes can isolate individual persons by the root node of their feature-geometric subtree. A probe rooted at [speaker] alone will see only first person singular and plural, for example. Under Agree, the copied value of the matched [speaker] is the entire φ-geometry. Thus as in Béjar (2003: 55ff.), Béjar and Řezáč (2004), the specification of a probe performs a sorting among goals into those that match/satisfy it and those that do not, but for those that do, the full φ-value rooted at [RE] is copied in the valuation of the probe. A [speaker] probe will keep the distinction between first person singular and plural in Figure 4.6, and also copy the [individuation] node that is not shown. The underlying reason for this is that on the goal, [speaker] is indeed contained in larger geometry, rooted at [RE]; this geometry is a part of the interpretation of [speaker], each node contributing its own meaning. This point is not relevant to uninterpretable probes, which can accordingly be [speaker] alone.

Probes that pick out other datives can be read off Figure 4.5. Picking out a 1SG dative alone would mean that a probe can be a conjunction such as ([speaker], [minimal]), requiring as match a DP that has both members of the conjunction, rather than either. I find this conceptually suspect; nor does the data inspire confidence in its necessity. Among the DL systems present in Basque, those that pick out all first person datives are common, but picking out 1SG datives alone seems to be a transitory stage towards picking out all first persons and it may be due rather to an incomplete grammaticalization of DL, implemented by whatever mechanism implements arbitrary gaps anyway.

On the other hand, the absence of DL for second person without DL of first person seems robust. It would follow if second persons are not in fact specified for [addressee] but the default interpretation of [participant], a possibility made available by the feature geometry (cf. Harley and Ritter 2002: 502, Béjar 2003: 45). In that case there can be no [addressee] probe; the minimal probe that includes second person is a [participant] probe, for which first person is a match as well. Finally, picking out 1PL alone may also have internal reality, in that there are dialect groups that do so without a tendency to generalize to 1SG; an [addressee] probe would do the job.

A probe rooted at [local] would pick out third person datives as well. This seems to be absent in Basque (Fernández 2001), though I will suggest below that this absence might be a mirage. I have already mentioned that Itelmen appears to have a close analog of Basque dative displacement: first/second person datives optionally control the suffixal morphology canonically reserved to first/second person objects. This is illustrated in (26), where the first example has DL and the dative controls the suffix morphology (boldface), while the second has the direct object control the suffix, not the dative (the dative either does not undergo DL, and/or it is not in the applicative construction at all but below the theme). If this is correct, then Itelmen has dative displacement of third person datives as well, indicating a φ-probe on P rooted at [local], for these third person datives control the suffixal morphology in the same way as first/second persons do, but unlike third person direct objects (Bobaljik and Wurmbrand 2001). This is shown in (27): in the first example the person features of the direct object do not play a role in conditioning the suffix, indicated by the gloss 1 > 3PL to show that it is the person features of the agent that do instead. Bobaljik and Wurmbrand (2001) establish a generalization that the agent's person features condition the suffix realization only if the object has no person features (as in Basque ergative displacement). In the second example the dative, despite being third person, does behave as if it had a person feature that conditioned the suffix, and there is no sensitivity to the agent.

(26) a. isx-enk n-zəl-ał-**um** kza kəma-nk?
father-LOC IMPRS-give-FUT-1SG.OBJ you me-DAT
"Will father give you **to me**?"
(Bobaljik and Wurmbrand 2001: ex. 14b)

b. isx-enk n-zəl-ał-**in** kza kəma-nk?
father-LOC IMPRS-give-FUT-2SG.OBJ you me-DAT
"Will father give **you** to me?"
(Bobaljik and Wurmbrand 2001: ex. 15)

(27) a. kma tχe-ank t-łintłi-**čeʔn** pexal-eʔn
I them-DAT 1SG-put-1 > 3PL hat-PL
"I put **hats** on them." (Bobaljik and Wurmbrand 2001: ex. 16a)

b. kma tχe-ank t-łintłi-**peʔnen** pexal-eʔn
I them-DAT 1SG-put-3PL.OBL hat-PL
"I put hats on **them**." (Bobaljik and Wurmbrand 2001: ex. 16b)

In Basque, the morphology (the prefix) and the syntax (ergative displacement) of *v* is sensitive only to the [participant]-bearers on the "person" side of the feature geometry. Consequently, dative displacement of third person, [RE → local], would not be visible if it took place. Nevertheless, it can be affirmed that their [individuation] node does not undergo DL, unlike those of first/second person plural; for it is clear that the [plural] feature of 1/2PL but not 3PL datives controls plural agreement morphology under DL. The dialect of Arcangues, whose ditransitive paradigm has been given in Table 4.9, illustrates this: the DL 3SG.ERG > 2PL.DAT > 3SG.ABS = 3SG.ERG > 3PL.ABS form is *z-a-**it**-u*, where *it* is plural morphology controlled by the dative under DL, and this *it* is controlled by 3PL absolutive in 3SG.ERG > 2PL.ABS *d-**it**-u*; however, *ditu* is not a possible form for 3SG.ERG > 3PL.DAT > 3SG.ABS (*diote*).

In other words, if third person datives in Basque did undergo DL, they would have to do so in such a way that the probe on P that permits this, [local], does not copy the [individuation] node upon valuation from a third person, though it does so upon valuation from a first/second person. This is not an isolated instance of such an asymmetry. There are systems that have plural agreement contingent on first/second person agreement, for example Fiorentino and Trentino agreement with postverbal subjects (Brandi and Cordin 1989: 138 note 10), modern Georgian object agreement (Harris 1981: 214), and number agreement in Person Case Constraint contexts (Section 4.8, for example Sigurðsson 1996 on Icelandic). The mechanism needed to do this would limit not only what a φ-probe can be, but also what portion of the φ-feature geometry of a DP it can copy when valued. This seems to be independently required by partial probes in participial agreement for example, for it is not only that a participle (in the relevant languages) is insensitive to person values, it also does not copy them along with gender/class and number, as far as can be seen. It seems that a probe can not only specify what subtree of the feature geometry it is, but also how much of the feature geometry it can copy upon valuation. If Basque third person datives do not copy the [individuation] node, their DL will never be detectable.

I have not raised this merely to indicate the theoretical possibility of dative displacement of third person DPs in Basque. Rather, this mechanism provides a further means to parametrize the φ-probe of P, one that proves useful in encoding the properties of DPs with theta-related Case that is quirky. From a Basque-centric perspective, quirky theta-related Case seems to be a PP that is transparent for just the feature [local], and this is the basic idea I will take up in the following, penultimate section. Third person datives in Basque, always quirky, would in fact always undergo a minimal dative displacement.

4.8 Quirky Case

Section 4.1 alluded to a familiar distinction among DPs with theta-related Case, quirkiness. Some DPs with theta-related Case are completely invisible to the Case/Agree and A-movement system, like the oblique experiencer of *seem* in English and Czech; others, quirky, like the oblique experiencer of *seem* in Icelandic, do pass all the diagnostics of being visible for A-movement (see Sigurðsson 2002 for an overview), though the DP still cannot value a φ-probe. The distinction produces minimal contrasts such as that in (28) between English and Icelandic for the experiencer of *seem*, where in Icelandic the experiencer *mér* intervenes for A-movement of *Harald*, but the starred translation with *to me* is in fact fine in English.

(28) Jón telur [Harald$_i$ virðast (***mér**) [t_i hafa gert
Jon believes Harald.ACC to.seem me.DAT to have done
þetta vel]]
this.ACC well
"John believes Harald to seem (*to me) to have done this well."
(McGinnis 1998a: 82)

Following Belletti and Rizzi (1988), Chomsky (2000: 127) proposes that quirky Case is theta-related Case with additional structural Case. The theory of theta-related Case developed here provides a straightforward means of implementing quirky Case with the correct properties, which likewise situates it between structural and theta-related Case. Quirky Case is theta-related, so it is a PP whose DP complement is inside a phase. However, it is visible to a clausal φ-probe, as its visibility to A-movement indicates, and perhaps more specifically such properties as the binding subject-oriented anaphora (cf. Reuland 2001 for relationship to φ-Agree), the ability to be PRO (cf. Landau 2000), and the definiteness effect (cf. Chomsky 2000: 149, notes 90, 93; for quirky dative in Icelandic and the definiteness effect, see McGinnis 1998a: 51). In terms of the analysis developed here, the PP is in some way transparent for the φ-features of the DP. Evidently, it is not fully transparent, for quirky theta-related Case does not allow the φ-features of the DP to value external φ-probes.

It seems that quirky DPs Agree as if they were pure third person, with no value for number. Evidence for this featural composition comes from the *Person Case Constraint* (PCC; Bonet 1991, Taraldsen 1995, Sigurðsson 1996, Boeckx 1999, Adger and Harbour 2007, Anagnostopoulou 2003: chapter 5, Béjar and Řezáč 2003). In PCC a quirky DP, like *henni* in (29) (in its original position, t_j), intervening between a φ-probe and a DP with structural Case, blocks person agreement, (29b), but not number agreement, (29a), with the latter.

(29) PCC IN ICELANDIC DATIVE-NOMINATIVE AND ACCUSATIVE-NOMINATIVE CONSTRUCTIONS

a. Henni$_j$ hafði / höfðu$_i$ t_j fundist [þær$_i$] vera [duglegar]
her.DAT had.3SG/3PL found they(PL).NOM to.be industrious

b. Henni$_j$ hafði / *höfðuð$_i$ t_j fundist [þið$_i$ vera duglegar]
her.DAT had.3SG/*2PL found you(PL).NOM to.be industrious

(Sigurðsson 1996: 39; my annotations)

In Section 4.1 I have noted the existence of quirky ergatives, and it is expected that these would behave in the same way. The relevant pattern is observed by Magier (1983) for Gujarati, who has a very lucid discussion of related facts in neighboring languages (cf. also Comrie 1984, Bhatt 2006: 801). In Gujarati, the participle and auxiliary follow a regular absolutive pattern of agreement with the unaccusative subject and transitive object; however, first/second person transitive objects cannot agree. The phenomenon has not yet been brought into connection with the Person Case Constraint, and the reduction to it is tentative.[12]

(30) PCC WITH ERGATIVE SUBJECTS AND NOMINATIVE OBJECTS IN GUJARATI

a. tɛhme$_i$ aw-ā$_i$ cho$_i$
you.PL come-PF.MASC.PL be.PRES.2PL
"You have come." (Bhatt 2006: 801)
(*Intransitive subject controls agreement*)

b. mɛṃ tehmari behɛn-one$_i$ bolawi$_i$
I-ERG your sisters-ACC invited.FEM
"I invited your sisters." (Bhatt 2006: 774, citing Cardona 1965: 75)
(*Transitive third person object controls agreement*)

c. mā̃ĩ$_i$ tam-ne$_j$ mār-yā che
I you(PL)-ACC struck(MASC.PL) be(3)
"I have struck you." (Magier 1983: 251)
(*Transitive first/second person object does not agree*)

This behavior raises the following questions: (i) why does quirky Case intervene for person-Agree but does not control the person probe; (ii) why does it not control number-Agree while a DP with structural Case that matched a person probe would; (iii) why is it person-Agree rather than number-Agree with a farther DP that is blocked.

Many recent approaches to the PCC begin with the ideas (i) that a φ-probe can be decomposed into a [person] and a [number] probe, capable of Agree separately, and (ii) that while as with other theta-related Case something renders the φ-features of the quirky DP inaccessible to external φ-Agree, the invisibility is not complete (e.g., Taraldsen 1995, Boeckx 1999, Anagnostopoulou 2003, Béjar and Řezáč 2003). Taraldsen (1995: 310ff.) and Anagnostopoulou (2003: 269) propose that the dative DP's [person] features are actually visible and its [number] features are not, and since the latter do not make interpretive sense without the former for first/second person, valuation of an incoming [person] probe to third person ensues. The [number] probe sees nothing on the dative, and passes by it. The invisibility of the [number] features of the dative remains a mysterious property, a *defectiveness* on its part.

The notion of defectiveness is an obscure addition to the theory that needs to be derived. The dative displacement phenomenon seems to provide

[12] In the examples, glosses have been changed to match the usage of this volume. *mā̃ĩ* in (30c) should almost certainly be glossed ERG = *mEN* (*meṃ*) in (30b) (cf. Deo and Sharma 2002; the absolutive is *hū̃*); but regardless of its overt case morphology, the agreement alignment is absolutive and ignores transitive subjects.

precisely the right empirical and theoretical guide. Empirically, dative displacement clearly renders the φ-features of a DP with theta-related Case visible to external φ-Agree, and the visibility can be modulated according to the φ-features of the DP: first person datives, first/second person datives, etc. To deal with this theoretically, I have proposed that the normal opacity of a PP to external Agree is obviated by putting a φ-probe on P, and modulating the content of its φ-probe allows it to select (match) only certain DPs for Agree.

The extension that is required to deal with quirky theta-related Case is for the φ-probe on P to selectively transmit the φ-features of DPs in such a way that they all end up looking like a particular type of third person DP. The necessary type may be seen from empirical considerations. Quirky Case DPs do not seem to interfere with remote number agreement across them; they block person agreement across them; but they do not themselves behave as if they were [participant] in languages like Basque, where they fail to provide a value to the [participant] (prefix) morphology, and do not interfere with its valuation from the external argument under "ergative displacement" (Section 4.3). These properties follow if the P of their PP shell has a probe that cannot be valued for more than [RE → local]. If a probe can be parametrized for the φ-features that it can copy under valuation, as suggested at the end of the last section, then such a probe will copy only the [RE → local] portion of the feature geometry of a DP, omitting for example [individuation] and [participant]. This will give to the PP containing the DP the properties of a person-bearing but non-participant DP that has no number specification, that is, of quirky theta-related Case:

(31) Quirky Theta-Related Case
A PP that has [3 → local] φ-specification on its P head, from restricted φ-Agree of P with its DP complement.

The necessity of deriving defectiveness in understanding the Person Case Constraint is emphasized by Richards (2004: 156ff.). He comes to the conclusion that quirky theta-related Case is theta-related Case + third person expletive, which is what makes it visible to clausal φ-Agree and makes it behave like third person. It seems to me that Basque dative displacement, and its variation according to the φ-features of the dative DP, provide exactly the right empirical analog to draw upon in eliminating defectiveness. This difference should not obscure the shared conceptual agreement, already implicit in the Taraldsen–Anagnostopoulou proposal. For their proposal is that a quirky dative does enter into regular φ-Agree, just in a reduced way; the natural development is to effectuate the reduction through tools that the theory needs independently. There is no special primitive of defective Agree invoked.

4.9 Conclusion

Taking stock of the proposals made here, the most important are:

(i) Case Opacity holds because theta-related Case is a PP, normally an opaque domain.
(ii) Case Opacity is not absolute, and this can be modeled in the familiar terms of selective "unlocking" of an opaque domain through properties of its head.
(iii) The specific mechanism can be thought of as φ-Agree between a P-head and a DP in its c-command domain.
(iv) Properties of P and their interaction with properties of DP can parametrize what Ps are transparent for what DPs.
(v) Quirky Case is just one of the varieties of such partially transparent PPs, one that is transparent for the minimal person specification only.

Through this, certain special properties are brought into the fold of more familiar ones with broader scope. Neither Case Opacity, nor quirkiness, nor defectiveness, are primitives. Case Opacity comes down to opacity, to phasehood, of a domain independently known to be opaque. Quirkiness and defectiveness come down to one point on a scale of variation in selective transparency of such opaque domains that must be captured in some way, given dative displacement. The specific mechanisms that establish selective transparency are more internal to a group of less widely shared proposals about the interaction of Agree and φ-feature structures. Here dark creatures still lurk in odd corners, but the approach shows promise.

More ought to be said about PP–CP parallelism, and the difference between DPs "with" structural Case, that is bare DPs, and those with theta-related Case, that is a PP shell. The guiding intuition is that the defining property of DPs with structural Case is the absence of potential functional architecture above a certain point; pushing the PP–CP parallelism, they are like ECM TPs. This makes them transparent because they are incomplete, to φ-Agree for example, while CPs/PPs are opaque and complete. Another way of capitalizing on the difference is to derive the Case Filter from the structural deficiency of bare DPs. This is the proposal of Cardinaletti and Starke (1999), and with a different mechanism, Řezáč (2003).

PPs are complete and their DPs need no external licensing. I have dealt with PPs in the specifier of ApplP mainly and somewhat with those in the specifier of *v*P, but their canonical distribution also includes the arguments of simply V, typically below a theme/patient DP with structural Case if there is one. Such PPs would not be reachable by clausal φ-Agree at all, but their P also might have a φ-probe. For them, and for PPs in general, one would expect to find Ps that overtly manifest their φ-Agree with their DP complement: agreeing adpositions, like agreeing complementizers. These occur, but caution is in order (see Jouitteau and Řezáč 2006). Arguments comparable to van Koppen's argument that West Germanic complementizer agreement is φ-Agree have not been presented for adpositional agreement.

I will end on an example of agreeing adpositions of general interest for the study of the relationship among adpositions, agreement, and DPs: Abaza (O'Herin 2002). Abaza has agreeing postpositions, like *wara wəqaz* "for you" in (32a). O'Herin argues that the agreeing postposition in (32a) is the source of verbal agreement with an applicative object, as *r-z* in (32b). Specifically, the independent agreeing postposition can incorporate into the agreement complex, where it is spelled out as an applicative morpheme (*z*) + agreement with its DP complement (*r*). There are a number of advantages to his analysis: it explains why in Abaza diagnostics indicate that even in applicative constructions the c-command relations are *theme* > *applied object*, a traditional stumbling block for reducing applicatives to adpositional constructions elsewhere, and why multiple applicatives as in (32b) are possible.[13]

(32) a. sara bilet wara$_i$ wə$_i$-qaz y-ʕa-s-aw-d
I ticket you 2SG.MASC-for 3SG.I-PREV-1SG-find-DYN
"I found the ticket for you." (Abaza, O'Herin 2002: 219)

b. y-[lə-cə]$_A$-[r-z]$_B$-[a-la]$_C$-ħ-č̌ʲpa-t′
3SG.I-3SG.FEM-COMIT-3PL-BEN-3SG.I-INSTR-1PL-do-DYN
"We did it [with her]$_A$ [for them]$_B$ [with it]$_C$."
(Abaza, O'Herin 2002: 229; my annotations)

Abaza, on this analysis, has clausal agreement that is perhaps the result of φ-Agree, but that at any rate has nothing to do with any agreement or Case-licensing relation between the main predicate's functional architecture and the agreement controllers. It is salubrious to see. It is also well within the range of the analysis proposed here. It makes one wonder whether somewhere there might not be a transparent spellout of an agreeing dative of the Basque dative displacement type, as agreeing adposition + clausal φ-Agree with it: an anonymous reviewer and me alike. I have not found one yet.

[13] Glosses have been adapted. The annotations are mine.

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5

Conditions on Phi-Agree

SUSANA BÉJAR

5.1 Introduction

This paper examines conditions on agreement, more specifically, restrictions on the φ-feature structures that enter into verb–argument agreement relations. Agreement restrictions are typically inferred on the basis of contexts where agreement seems to fail. The cases investigated here involve failure of particular φ-feature values to agree, precisely in the context where others succeed: for example, third person objects that fail to agree in languages that clearly have object person agreement when the object is something other than third person; or singular arguments that fail to agree, though the language clearly has number agreement when the same argument is plural. Curiously, an argument that fails to agree for one portion of its φ-set may yet agree for another portion, thus giving rise to *partial agreement*, instances of subject or object agreement for person, but not number, and vice versa.

An illustration of partial agreement is given in the following fragment of a transitive paradigm from Erzya Mordvinian, a Uralic language. Agreement morphology is set in bold type. On the right of each example I schematize the φ-features of the subject and object, in the format Subject > Object, and here boxed bold type is used to indicate which features of which argument are tracked by the agreement morphology.

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(1) Erzya Mordvinian (*sodams* "to know")

a. soda-s-**y-ńek** $\boxed{1\textbf{PL}} > 3\,\text{SG}$
know-TNS-**PL**-1
"We know him."

b. soda-s-**y-ń** $\boxed{1}\,\text{SG} > 3\,\boxed{\textbf{PL}}$
know-TNS-**PL**-1
"I know them."

c. soda-s-**am-iź** $3\boxed{\textbf{PL}} > \boxed{1}\,\text{SG}$
know-TNS-1-**PL**
"They know me."

d. soda-s-**am-iź** $3\text{SG} > \boxed{1\textbf{PL}}$
know-TNS-1-**PL**
"He knows us."

In (1) we see that Erzya Mordvinian has agreement for both person and number, and this agreement can be controlled by either the subject (1a), or the object (1d), or both (1b,c). The latter (1b,c) are of particular interest: agreement morphology incompletely tracks the φ-features of each NP, agreeing with the person of one argument, and the number of the other. In these cases, the φ-bundles of both the subject and the object clearly enter into an agreement relation with the verb, but only a subset of the argument's φ-features enter into the agreement relation. This despite the fact that complete φ-agreement is clearly a possibility for both subjects (1a) and objects (1d).

The first question raised by partial agreement systems is what restriction(s) lead(s) to failure of agreement with certain φ-features but not others? Other known agreement restrictions rule out agreement across the board. For example, structural Case assignment is known to block subsequent agreement in many, though not all, languages (the *activity condition* of Chomsky 2001, cf. case freezing in earlier work); likewise, and arguably for the same reasons, oblique NPs are often unable to control agreement. What is unusual about partial agreement is that it results from a restriction, not on syntactic position or argument-structural function, but on φ-feature content. Thus, some NPs are subject to the restriction, while others are not.[1]

1 In this respect, partial agreement is reminiscent of person/animacy restrictions on NPs in certain contexts (e.g., Perlmutter's 1971 *me-lui* constraint, Bonet's 1991 Person-Case Constraint, Ormazabal & Romero's 2002 animacy restrictions).

A second question arises because partial agreement presents a prima facie counterexample to the widely shared conjecture that agreement is an all-or-nothing (AON) operation: agreement with the φ-bundle of an NP should be exhaustive, or not at all (henceforth the AON condition). This position is articulated in the various incarnations of the theory of agreement proposed by Chomsky in the past decade (Chomsky 1995, 2000, 2001). In other frameworks it may not be explicitly stated, but as far as I can tell it is tacitly assumed. However, if a target can agree with the person features of one argument and the number features of another, then the AON requirement is improperly stated.

What I will argue below is that the AON condition is essentially correct, but that its domain of application must be refined: it applies only to features in an entailment network. (A feature F entails another feature G if every category that contains F also necessarily contains G.) For reasons to be elaborated below, in partial agreement languages the φ-bundle as a whole does not define an entailment network, but rather sub-φ sets do (e.g., just person features or just number features). Thus, partial agreement is not an AON violation and the AON applies within sub-φ domains, making separate person and number agreement possible. The restriction of the AON condition to entailment networks is itself a consequence of an *Entailment Condition on Probes* (ECP): if a probe consists of more than one feature, then the features must be related by entailment. The ECP is what enforces the AON condition on coherent subsets of φ-features: namely, person as a whole, and number as a whole. If probes are restricted by entailment, then it follows necessarily that the AON condition must be as well, given its status as a condition on the valuation of probes.

The ECP sets the stage for a straightforward answer to the first question. I will show that, given the ECP, the failure of agreement with certain φ-features can in fact be modeled as an AON effect. This will follow automatically from the feature system adopted here, which assumes privativity and logical underspecification. Subcategories of person and number differ with respect to their degree of feature structure, a property which will be exploited in the implementation of the AON condition.

A final note: under classical assumptions about syntactic agreement, the partial agreement cases to be seen here are paradoxical: agreement is sometimes with the subject, sometimes with the object, sometimes with both. If the locus of the agreement relation is structural, and if the identification of the controller is determined by standard locality conditions, then subject agreement should occur when the locus is high as in (2), and object agreement should occur when the locus is low as in (3):

(2) … Probe … Subject … Object …

(3) … Subject … Probe … Object …

It would seem that in languages like Mordvinian the distribution of agreement heads is rather mercurial. Specifically, it seems that agreement must be high as in (2) for (1a), but low as in (3) for (1d) and *both* high and low for (1b) and (1c). This locality paradox receives a derivational solution in Řezáč 2003, and is also addressed in Béjar 2000a,b, 2003, and Béjar and Řezáč 2004. It will not be addressed here, except in passing.

The chapter is structured as follows. Section 5.2 discusses the nature of the syntactic relation *Agree* and restrictions on it. Section 5.3 provides a more thorough introduction to the phenomenon of partial agreement and demonstrates that it is, at core, a syntactic, and not a morphological, phenomenon. Section 5.4 focuses on the ECP, the theory of φ-features that it presupposes, and explains the nature and typology of φ-probes. This formal account predicts the existence of partial agreement. Section 5.5 verifies the account by examining two different languages in detail, Mordvinian and Karok.

5.2 Agreement and Agree

The proposals to be discussed here (previously introduced in Béjar 2003) emerged in the context of the small explosion of interest in agreement of recent years amongst researchers working in the minimalist framework. Partial agreement is just as much a challenge to other approaches and I suspect the solutions presented here could be outfitted to suit these. I will attempt to keep the discussion as general as possible, but the exposition here will make reference to minimalist terminology and mechanics. In particular, I will refer to Agree, a syntactic operation (as opposed to agreement, the surface phenomenon), in the sense of Chomsky 2000, 2001. A basic overview of the Agree framework is given in the next section for readers who may not be familiar with it.

5.2.1 *Agree*

The operation Agree defines agreement as a relation between two elements within a syntactic domain: a *probe* and a *goal*. (In other commonly used terminology, the probe is the *target* of the agreement relation, and the goal is the *controller*). The metaphor of a search aptly describes the relation between them, with the probe as seeker and the goal as object. The probe itself is modeled as an unvalued set of φ-features on a functional head, which is uninterpretable as such and must receive a value from some other syntactic constituent. The unvalued probe has three functions: (i) it triggers the search for a goal; (ii) it defines the search criteria (φ probes φ, *wh* probes *wh*; in principle any unvalued uninterpretable feature F can be a probe, and will define a search for interpretable F); (iii) it defines the search domain: a goal must be the nearest matching element contained in the sister of the probe. The goal of a probe is identified by a matching operation (*Match*) which halts the search. If no restrictions are violated by the probe–goal pair, the unvalued φ-set of the probe takes on the values of the φ-set of the goal.

5.2.2 *Restrictions on Agree*

In this framework, restrictions on agreement are restrictions on either the matching operation or on Agree itself. Match is restricted at the very least by a locality condition which requires the goal to be the closest XP with φ-features in the search domain of the probe.[2] Since Match defines the set of possible controllers (in order to Agree, an XP must Match), any restriction on Match functions transitively as a restriction on Agree. While Match is necessary for Agree, it is not sufficient. Not all matching goals successfully Agree. Thus, there exists a class of restrictions on Agree, proper.[3]

The AON condition, introduced in the previous section, prohibits incomplete agreement. In other words it prohibits Agree if the operation would only partially value the uninterpretable φ-bundle (Chomsky 2000: 123–4, n. 72, n. 75; 2001: 6–8, 15–19, n. 30). The AON has never been included in the formal statements defining Agree, however Chomsky has articulated it in various contexts, for example:

> We take deletion [Agree] to be a "one fell swoop" operation, dealing with the φ-set as a unit. Its features cannot selectively delete: either all delete, or none. The φ-features of T do not agree with different NPs, for example. (Chomsky 2000: 124)

[2] Béjar 2003 proposes a further restriction on Match, also formulated in terms of entailment relations between features, but it is not relevant to the cases discussed here.

[3] Perhaps the most intensely scrutinized of these is the so-called activity condition (already alluded to in the introduction), which requires that a goal be "active", where an active goal is one that has not yet been Case-licensed. Since, in the Agree framework, Case licensing reduces to φ-feature Agree, an active goal is one that has not yet functioned as the goal in a probe–goal relation. This restriction on agreement will not enter into the discussion of partial agreement here, though it is relevant, since a goal that undergoes partial agreement raises technical and empirical questions with respect to the activity condition, namely what is the status (active or inactive) of a goal that has partially agreed. Given the analysis of Mordvinian, the only position consistent with the current work is that it remains active.

Thus, if local (P, G) [P a probe, G a goal] match and are active, their uninterpretable features must be eliminated at once, as fully as possible; partial elimination of features under Match, followed by elimination of the residue under more remote Match, is not an option. (Chomsky 2001: 15)

The AON condition is, at least at face value, incompatible with partial agreement as I've construed it. In (1), there is agreement for person but not for number, or vice versa, with each of the arguments, so the φ-bundle of the probe as it is standardly conceived is only partly valued by either goal, with the residue valued by something akin to "more remote Match".

Whereas the AON condition prohibits partial agreement with a (complete) φ-set, another closely related condition, *Defectivity*, prohibits (full) Agree with an incomplete φ-set. Defectivity says Agree fails if a φ-set is "defective" in the sense that it is incomplete. The assumption that φ-features travel in bundles and that the elements in the bundle can be independently judged complete or incomplete is widely held (though it will be challenged here in due course). The Defectivity condition is highly reminiscent of the AON condition, but one does not reduce to the other. Defectivity says that an incomplete φ-set cannot Agree, while the AON condition says that a complete φ-set cannot Agree incompletely. To clarify, consider the range of possible scenarios in (4) to (6) for a feature bundle [F G H] where it is independently determined that absence of any of the three features in this bundle constitutes incompleteness ("***u***" before the features on the probe indicates that they are unvalued).

(4) probe goal
[***u***F ***u***G ***u***H] [F G H]

(5) probe goal
[***u***F ***u***G] [F G H]

(6) probe goal
[***u***F ***u***G ***u***H] [F G]

All else being equal, the probe–goal pair in (4) is licit because all features of the probe find a counterpart on the goal, neither is incomplete. Were the goal to value only features [***u***F ***u***G] of the probe, this would constitute an AON violation. In (5) the probe is defective and will thus restrict Agree, while in (6) the goal is defective and will restrict Agree. If (6) were to Agree, it would constitute an AON violation, as the probe would only be partially valued.[4]

[4] This discussion deliberately abstracts away from an added dimension of the theory of Agree, which is that feature valuation in a probe–goal relation is thought to be symmetric: the goal also has

The AON Condition coupled with Defectivity, along with the assumption that φ-features generally cluster in bundles and can be typed as "complete" or "incomplete", make the strong prediction that partial agreement systems should be impossible. Given strong empirical evidence suggesting that partial agreement *is* attested, the status of these restrictions requires re-examination.

5.3 Partial agreement: syntax, not morphology

In this section, I present a closer look at partial agreement, though narrow discussion of the data is deferred to Section 5.5. The main point to be made is that partial agreement is syntactically partial, rather than syntactically complete but subject to partial exponence (i.e., syntactically complete but morphologically partial). A morphological account would not precipitate revision of the AON Condition and Defectivity. However, there are robust patterns in partial agreement languages that a morphological account, even though it can capture them, cannot explain. This sets the scene for the syntactic account of the subsequent sections.

The sample of Mordvinian agreement—

(7) Erzya Mordvinian (*sodams* "to know")

a. soda-s-**y-ńek** $\boxed{\text{1PL}} > \text{3SG}$
know-TNS-**PL**-1
"We know him."

b. soda-s-**y-ń** $\boxed{1}\text{SG} > 3\boxed{\text{PL}}$
know-TNS-**PL**-1
"I know them."

c. soda-s-**am-iź** $3\boxed{\text{PL}} > \boxed{1}\text{SG}$
know-TNS-1-**PL**
"They know me."

d. soda-s-**am-iź** $\text{3SG} > \boxed{\text{1PL}}$
know-TNS-1-**PL**
"He knows us."

—is clearly distinct from defective agreement, for the following reasons:

uninterpretable features that require valuation by the probe. Technically, the restriction on agreement in cases where the probe is φ-incomplete/defective is a restriction on the probe's ability to value the goal, not vice versa. Thus, a φ-incomplete probe can itself be valued (Chomsky 2001). An empirical case that is thought to correspond to this is verbal agreement in nonfinite contexts, where nonfiniteness is modeled in part by an incomplete φ-set on T. Note that modeling nonfiniteness in this way is a theory-internal maneuver. It is not clear what Chomsky would say about an incomplete φ-set on a finite probe. Cases of this kind are not considered in Chomsky 2000, 2001.

(8) a. That a subset of each argument's features controls agreement tells us that both arguments are in a licit agreement configuration at some point in the derivation.

b. That both NPs are able, in the right configuration, to enter into both person and number agreement tells us that there is no third factor block agreement for these subcategories. (This situation is to be contrasted with Romance participle agreement, say, where there is no configuration in which person agreement may emerge.)

c. That both person agreement and number agreement are ultimately successful tells us that there is no issue of probe defectivity. (Again, this contrasts with, say, Romance participles, which are defective for person.)

Points (a)–(c) are, as far as I can see, uncontentious, and the upshot is that the agreement pattern in (7) cannot be said to be defective in any meaningful sense, despite being partial.

A divisive issue in the conceptualization, and hence, treatment, of partial agreement phenomena arises with regard to the residue of features that fail to agree. I have been referring to partial agreement with the understanding that this residue, in fact, does *not* agree with the initial goal (though it may agree with a subsequent one). However, there is a class of analyses that would treat the partial agreement pattern as a morphological effect (e.g., Halle and Marantz 1993). Under this approach, the agreement process itself is assumed to be complete (full agreement with both arguments), but its exponence is rendered partial as a result of morphological rules or conditions.[5] Most such analyses evoke a model of competition between potential controllers of a single agreement slot or vocabulary items available for insertion at a particular site; in both cases, the winner is chosen on the basis of a hierarchy of preferences. This essentially reduces the problem to morphological gaps of one sort or another and has the advantage of avoiding any challenge to the AON restriction.

The morphological gap analyses have no difficulty capturing the partial agreement pattern. In fact, it is their excessive latitude that is their greatest failing. Specifically, they do not capture the most striking fact about these systems: a bleeding–feeding pattern that reveals a clear preference for one argument over the other (Béjar 2000a, 2003, Řezáč 2003, Béjar and Řezáč

[5] This issue is independent of where in the grammar one regards agreement relations as being established (on which, see Bobaljik, this volume): irrespective of the module in which these relations are formed, the possibility remains that, initially, all features of each agreeing argument agree, and only later is this agreement disrupted so as to create the appearance of partialness.

Table 5.1 Object vs. subject agreement: Mordvinian

object controller		subject controller	
VERB-d-**ad**-yź VERB-TNS-2-PL	I VERB **you**.PL	VERB-s-y-**t́** VERB-TNS-PL-2	**You** VERB them
VERB-s-**am**-iź VERB-TNS-1-PL	You VERB **us**		
VERB-s-**am**-iź VERB-TNS-1-PL	He VERBS **us**	VERB-s-y-**ń** VERB-TNS-PL-1	**I** VERB them

Source: Abondolo 1982.

2004), only when agreement with the preferred argument fails is it possible for an agreement relation to be established with the other. This pattern is robust, recurring across languages with partial agreement. It is illustrated in Tables 5.1–5.4 (duplicated from Béjar and Řezáč 2004) for person agreement in Mordvinian, Karok, Basque, and Georgian. Each of the tables is organized with object agreement on the left and subject agreement on the right. The verb forms here are schematized to make salient the relevant agreement slot; it is boldfaced in addition. Object agreement consistently occurs if the object is first or second person, in which case subject agreement does not. Subject agreement consistently occurs if the object is third person, in which case object agreement does not.

The choice between subject and object as controller is clearly conditioned by their π-specification, since all other variables remain constant. What we see is that the object always controls agreement *if it can do so* (i.e., when it is not third person); and when the object controls agreement, it *bleeds* subject agreement. It is just in the context of a non-agreeing object that a subject can be the controller. (If both subject and object are third person,

Table 5.2 Object vs. subject agreement: Karok

object controller		subject controller	
ki-VERB-**ap** 2PL-VERB-2PL	I VERB **you**.PL	**'i**-VERB 2-VERB	**You** VERB them
kin-VERB 1PL-VERB	You VERB **us**		
kin-VERB 1PL-VERB	He VERBS **us**	**ni**-VERB 1-VERB	**I** VERB them

Source: Bright 1957.

Table 5.3 Object vs. subject agreement: Basque

object controller		subject controller	
z-VERB 2-VERB	I VERB **you**	**z**-VERB 2-VERB	**You** VERB him
n-VERB 1-VERB	You VERB **me**		
n-VERB 1-VERB	He VERBS **me**	**n**-VERB 1-VERB	**I** VERB him

Source: Béjar and Řezáč 2004.

default agreement emerges. See Harbour 2006 for an implemention of Agree that yields default agreement when valuation is impossible.) In other words, failure of object agreement *feeds* subject agreement. The reverse does not hold: whereas the availability of subject agreement is contingent on the φ-features of the object, the availability of object agreement is wholly independent of the φ-features of the subject.

This bleeding pattern is unexpected if full agreement relations are initially established with both subject and object but are later disrupted to produce partial agreement patterns: it is merely as plausible and possible as any other morphological distortion of the underlying agreement relation. This leaves the crosslinguistic recurrence unexplained. However, if the agreement relation itself is initially partial, and targets a preferred controller prior to resorting to a second, then the bleeding pattern is the natural, near inevitable, outcome.

5.4 Entailment Condition on Probes

We have arrived at the following situation. Empirically, it is clear that the phenomenon of partial agreement is real. Moreover, it shows robust biases

Table 5.4 Object vs. subject agreement: Georgian

object controller		subject controller	
g-VERB 2-VERB	I VERB **you**	**Ø**-VERB 2-VERB	**You** VERB him
m-VERB 1-VERB	You VERB **me**		
m-VERB-S 1-VERB-SUFFIX	He VERBS **me**	**v**-VERB 1-VERB	**I** VERB him

Source: Harris 1981, Hewitt 1995, Nash 1995.

with respect to preferred controllers of agreement. These biases cannot be captured by positing initially complete agreement relations subject to later impoverishment. However, if the computation restricts which Agree relations are established to begin with, then partial agreement follows naturally. Thus, Agree must be able to establish relations between sub-φ probes and sub-φ goals. Theoretically, this is problematic, as the AON condition constrains Agree to deal in whole φ-sets. Nonetheless, this does not necessarily mean that the AON condition is wrong, as there are two ways in which sub-φ Agree relations could be established: either every feature probes on its own (violating the AON condition), or coherent sub-φ sets of features probe together (respecting a sub-φ version of the AON condition). I will show that Mordvinian and Karok can be straightforwardly analyzed if we adopt the latter position.[6] This is presented in the next section. The current section deals with the requisite preliminary of feature inventory and feature structure. My principal proposals will be that features in an entailment relation must probe simultaneously, and that probing features must be subsets of goal features. The operation of these constraints is illustrated when we turn to actual analysis.

5.4.1 *Phi-features*

In this section, I present a theory of φ-features in which different persons/numbers are represented by different sizes of feature bundles (Béjar 2003, following aspects of Harley and Ritter 2002). This arises by adopting privative features, which induces logical underspecification of feature representations. I exploit variation in feature bundle size to account for the differential outcome of Agree seen in cases of partial agreement.

The feature inventory I adopt is {[π], [participant], [speaker], [ω], [plural]}. These features are privative, which means that absence is interpreted as negation. Let us consider person, first. The three basic persons are represented as follows:

(9) First person, Second person, Third person

$$\begin{bmatrix} \pi \\ \text{participant} \\ \text{speaker} \end{bmatrix} \quad \begin{bmatrix} \pi \\ \text{participant} \end{bmatrix} \quad [\,\pi\,]$$

The semantic justification for these representations is straightforward. As all are persons, all are [π]. As only first and second are speech act participants, they are also [participant]. And, lastly, [speaker] differentiates first from second person. These features are in a series of entailment relations

[6] This is in keeping with the approach taken in Béjar 2003. See Béjar and Řezáč 2004 for an attempt to work out the former position. It is entirely possible that the two approaches will ultimately reduce to notational variants of one another, depending on various ontological commitments.

therefore: anything that is specified for [participant] is specified for [π], and anything that is [speaker] is specified for [participant]. Feature specifications obligatorily reflect these entailment relations. So, for example, first person is always fully specified as [π participant speaker], and never as [π speaker] or [speaker], say.

(10) Entailment Relations Between Person Features
[speaker] $\models$ [participant] $\models$ [π]

Number is similar but simpler. Singular is [ω] and plural, [ω plural].[7] The entailment relations below hold:

(11) Entailment Relations Between Number Features
[plural] $\models$ [ω]

(See Harley and Ritter 2002 on the representation of φ-categories, such as the inclusive, or dual, not discussed here.)

5.4.2 *Phi-probes*

I propose that φ-probes share the same feature inventory and structure as their interpretable counterparts. Two important points must be clarified: what can constitute a φ-probe and what can value a φ-probe. Once we have done so, a typology of possible probe–goal relations emerges, with partial agreement falling out as one of the possibilities.

The feature structure of the probe had been given little consideration prior to Béjar 2003 (but see Starke 2001, and since then Béjar and Řezáč 2004, and Nevins forthcoming). The φ-probe is generally thought of as an unstructured bundle of φ-feature subcategories (e.g., person, number) with no value specified. Béjar 2003 proposes that uninterpretable φ-probes have the same representations as their interpretable counterparts, and are thus structured bundles, whose subparts are related by an entailment hierarchy. This raises a number of questions, first and foremost, which of the feature representations in (9) is the analog of the unvalued person feature in the conventional φ-bundle of a probe? The answer that I propose is that any of them can be probes—this is a language-specific choice and reduces to more general questions about how the functional inventory of a language is selected/parameterized. In other words, the representation of a probe for person, say, is selected from the representations in (9). The choice of probe structure has far-reaching consequences for the class of agreement system that emerges in a grammar, as I will show momentarily.

[7] These are not the number features proposed by Harley and Ritter 2002. They use the labels [individuation] and [group] to specify singular and plural (count) nouns. See Harbour 2007 for a semantically sophisticated approach to number feature subcategories.

If any of the features in (9) can be probes, then the definition of a probe as an unvalued feature is called into question. Unlike conventional feature models, in a privative system, there is no distinction to be made between a feature's label (e.g., [participant]) and its value (e.g., [+] or [–]). Thus, the received view of a probe as an unvalued feature bundle is incoherent in the approach being outlined here. Instead, I assume, following Pesetsky and Torrego (2001), that a probe is defined as such by virtue of being uninterpretable, and that interpretability is a function of context (e.g., nominal features are interpretable on nominal heads, but uninterpretable elsewhere; φ-features are uninterpretable on a functional projection like tense).

This change of view raises the question of how to define Agree if it is not an operation of feature valuing. In actuality, this is more a technical problem than a substantive one. The notion of valuing is not intrinsic to the definition of Agree, and the operation, or its equivalent in other frameworks, has been defined in various ways (e.g., as feature-checking in early Minimalism; feature unification in LFG, HPSG, CG). For present purposes, I assume that agreement is in effect a copy/match operation (independently available under the copy theory of movement): features of the goal are matched with, and, if needed, copied from the goal onto the probe (cf. Béjar and Řezáč 2004). As far as I can tell this does not introduce any insurmountable complication into the theory of Agree. I assume that Agree involves matching the features of the probe with interpretable counterparts; only features paired in this way are visible at the interface and capable of feeding agreement (Harbour 2006).

There are three possible probe–goal relations that Agree could contend with: (a) the features of the probe and goal are identical, (b) the probe features are a subset of the goal, or (c) the goal features are a subset of the probe. I assume that feature bundles in an Agree relation must be identical. If (a), the Agree relation is straightforward. If (b), then Agree is still possible, as the extra interpretable features of the goal can be copied onto the probe. However, if (c), some of the probe's features find no interpretable counterpart: were the probe features to be copied onto the goal, the interpretation of the goal itself would be altered (consider the effect of adding [speaker] to [π participant]).

This is precisely where the AON condition re-emerges in sub-φ form. Suppose the probe consists of [F G] and the goal, only of [G]. One might imagine either that no feature of the probe is valued in this case (total failure), or that just [G] is (semi-failure). My proposal is that, if [F] and [G] are in an entailment relation, then incomplete matching is impossible; conversely, if [F] and [G] are not in an entailment relation then incomplete matching is possible. This is, of course, a relativized AON condition: it affects person and number separately. Person features form an entailment network, so all person features of a probe must be matched with a single goal (likewise for number). If number and person are separate probes on a single head, they may be valued by distinct goals, as there is no entailment relation between person and number: one may occur without the other. This requirement constitutes:

(12) Entailment Condition on Probes
If [F] and [G] are probe features on a single head and if [F] $\models$ [G], then [F G] probe together and may not be valued by different goals.

(Though I do not explore the relevant issues here, it is worth noting that the ECP could be divided into two conditions, the first affecting probes alone—probe features in an entailment relation must probe together—and the second affecting Agree relations alone—features in an entailment relation must be valued by a single goal. This last condition is equivalent to claiming that Agree fails when the feature structure of the goal is less specified that that of the probe.)

The ECP shapes the probe structure of a language. A partial agreement language is thus one in which the ECP dissects the φ-bundle into separate entailment networks. (This is to be contrasted with another typological possibility where person and number constitute a single φ-probe. In a complete φ-structure, [φ π ω], both person and number entail the root φ-node: $\pi \models \varphi$, and $\omega \models \varphi$. Consequently, a single φ-probe can only be valued by a single goal. Partial agreement is predicted to be impossible in such a language.)

5.4.3 *Typology of probe–goal pairs*

With this revised theoretical stance, let us now consider the set of possible person agreement configurations for the feature inventory assumed above. There

Table 5.5a Typology of probe–goal pairs (person features)

Probes	Goals		
	[π]	[π participant]	[π participant speaker]
[$u\pi$]	P⊆G and P⊇G	P⊆G	P⊆G
[$u\pi$ *u*participant]	P⊇G	P⊆G and P⊇G	P⊆G
[$u\pi$ *u*participant *u*speaker]	P⊇G	P⊇G	P⊆G and P⊇G

Table 5.5b Success or failure of Agree with probe–goal pairs (person features)

Probes	Goals		
	$[\pi]$	$\begin{bmatrix}\pi \\ \text{participant}\end{bmatrix}$	$\begin{bmatrix}\pi \\ \text{participant} \\ \text{speaker}\end{bmatrix}$
$[u\pi]$	Agree succeeds	Agree succeeds	Agree succeeds
$\begin{bmatrix}u\pi \\ u\text{participant}\end{bmatrix}$	Agree fails	Agree succeeds	Agree succeeds
$\begin{bmatrix}u\pi \\ u\text{participant} \\ u\text{speaker}\end{bmatrix}$	Agree fails	Agree fails	Agree succeeds

are three possible probes and three possible goals, yielding nine potential probe–goal pairs. Given (12), not all of these pairs are licit. For certain probe–goal pairs, Agree will fail, and this is the basis for partial agreement paradigms. The possibilities are schematized in Table 5.5a. The pairings where the probe is *not* a subset of the goal are shaded. In these pairings, the goal is, in a sense, "incomplete" with respect to the probe, and, given (12), Agree fails here (Table 5.5b).

We now have an answer to the question initially posed at the beginning of this chapter: what restriction(s) lead(s) to failure of agreement with certain φ-features but not others? The answer is that the entailment condition restricts the implementation of Agree, such that certain φ-subcategories successfully agree where others do not. The structured probes in Tables 5.5a,b define a typology of agreement systems. The more structure the probe has, the more restrictive Agree is. The class of agreement system defined by the top row in Tables 5.5a,b corresponds to the familiar agreement systems where there is no partial agreement. The class of languages defined by the bottom row I argue in Béjar 2003 to correspond to languages with robust person hierarchies, like the Algonquian family (see also Béjar and Řezáč 2004).[8] I'll say no more about these here. Of particular relevance to the present discussion is the class of languages represented by the middle row, where first and second person goals may enter into Agree, whereas third persons do not. This exactly characterizes the pattern illustrated in Tables 5.1–5.4. In the next section, I examine more closely several cases of this type.

[8] See McGinnis, this volume, for arguments that at least some languages in the (c) class are fundamentally distinct from the (b) class in ways that do not reduce to feature structure as presented here; rather the related phenomena arise in different modules.

TABLE 5.6a Typology of probe–goal pairs (number features)

Probes	Goals	
	[ω]	$\begin{bmatrix}\omega \\ \text{plural}\end{bmatrix}$
[$u\omega$]	P⊆G and P⊇G	P⊆G
$\begin{bmatrix}u\omega \\ u\text{plural}\end{bmatrix}$	P⊇G	P⊆G and P⊇G

Exactly parallel considerations apply to number. Given (11), probes may be either [$u\omega$] or [$u\omega$ $u$plural], as may goals. There are four possible probe–goal pairings, as shown in Table 5.6a. As before, Agree fails only when the goal is a subset of the probe but not conversely (Table 5.6b). The behavior of number probes is illustrated in the next section.

It is worth noting that the position we have arrived at is not too far either from the AON condition or from Defectivity. On the one hand, the Entailment Condition on Probes resembles the AON condition in that it does not permit Agree relations to leave residue (though the nature of the residue is different for what is normally asserted for the AON condition). On the other hand, it resembles Defectivity in that Agree fails when the goal is incomplete with respect to the probe. This suggests that partial agreement phenomena do not undermine past accounts, but fine-tune them, as there is substantial similarity in the kinds of restrictions they posit.

5.4.4 *Dispreferred agreement controllers*

So far, we have discussed what makes Agree impossible between a probe and the first goal it encounters. Here, I will briefly note what enables Agree to be established with a different goal.

TABLE 5.6b Success or failure of Agree with probe–goal pairs (number features)

Probes	Goals	
	[ω]	$\begin{bmatrix}\omega \\ \text{plural}\end{bmatrix}$
[$u\omega$]	Agree succeeds	Agree succeeds
$\begin{bmatrix}u\omega \\ u\text{plural}\end{bmatrix}$	Agree fails	Agree succeeds

If the first argument that the probe encounters is a subject, then the probe simply continues its search downwards to the object. In this case, the probe is higher than the subject.

(13)	…	Probe	…	Subject	…	Object	…
				preferred agreement controller		(secondary controller)	

This is the familiar case in Agree relations.[9]

If the preferred controller is the object, then the probe must be between subject and object.

(14)	…	Subject	…	Probe	…	Object	…
		(secondary controller)				**preferred agreement controller**	

In this configuration, the question naturally arises as to how the probe can search upwards. Most simply, this can be supposed to follow from head movement of the locus of the probe to a position above the subject. A more sophisticated approach is that of Řezáč 2003 (see also Béjar and Řezáč 2004): if the probe is on v^0 and the subject is in the specifier of vP, then the projection of v^0 brings the probe into a position in which it dominates, and, so, can enter into an Agree relation with the subject. I do not explore which of these approaches is to be preferred. Either is sufficient for current purposes.

5.5 Verification of the account

I now turn to the analysis of two of the partial agreement languages illustrated above, Mordvinian and Karok. Despite the complexity of the patterns, I show that they readily yield to an analysis on which person and number are separate probes, subject to the ECP. This ensures that all person features, or all number features, probe as a whole (rather than piecemeal) and that valuation occurs only when all probing features are shared with the goal. Note that the following are not morphological analyses per se. Detailed analysis of the vocabulary items is not pursued. Rather, the concern is to account for the features that are made available to the morphology as a result of agreement operations.

5.5.1 *Mordvinian*

Mordvinian, like other Uralic languages, has a bifurcated agreement system, with one pattern for transitive verbs with definite objects, and another pattern

[9] Note, though, that this discussion abstracts away from the problem of the higher NP functioning as a defective intervenor for the object NP. The intervention effect can be avoided by displacement of the higher NP to subject position (see Chomsky 2000, 2001 for discussion).

Table 5.7 The nonpast transitive paradigm of Erzya Mordvinian

	1sgO	2sgO	3sgO	1plO	2plO	3plO
1sgS		-d-an -tns-2	-s-a -tns-1		-d-ad-yź -tns-2-pl	-s-y-ń -tns-pl-1
2sgS	-s-am-ak -tns-1-2		-s-ak -tns-2	-s-am-iź -tns-1-pl		-s-y-ť -tns-pl-2
3sgS	-s-am-am -tns-1-1	-d-anz-at -tns-3?-2	-s-y -tns-dflt	-s-am-iź -tns-1-pl	-d-ad-yź -tns-2-pl	-s-y-ńźe -tns-pl-3
1plS		-d-ad-yź -tns-2-pl	-s-y-ńek -tns-pl-1		-d-ad-y-ź -tns-2-pl	-s-y-ńek -tns-pl-1
2plS	-s-am-iź -tns-1-pl		-s-y-ŋk -tns-pl-2	-s-am-iź -tns-1-pl		-s-y-ŋk -tns-pl-2
3plS	-s-am-iź -tns-1-pl	-d-ad-yź -tns-2-pl	-s-yź-ø -tns-pl-3	-s-am-iź -tns-1-pl	-d-ad-yź -tns-2-pl	-s-yź-ø -tns-pl-3

Source: Abondolo 1982.
NB: I have parsed the plural differently from Abondolo, who separates *-i-ź/-y-ź*. I do not see what the basis for this is, and a simpler set of glosses is possible under my alternative. Even if I am wrong on this count, it should not really affect the substance of my claims here.

for intransitives and transitives with indefinite objects. Here we will examine the definite transitive conjugation, as it alone exhibits agreement with multiple arguments. It presents two paradigms, nonpast and past; however, as the structure of the paradigms is identical, I will illustrate the analysis using the nonpast forms only (Table 5.7). The shading in the top-left quadrant identifies forms that are idiosyncratic and so excluded from the analysis.

We saw above that person agreement is always with the object, unless the object is third person, in which case there is person agreement with the subject. A cursory inspection of the full paradigm (excluding the shaded cells) confirms this: when the object is first person, the agreement suffix *-am* always appears; when the object is second person, the suffix *-ad* always appears; and when the object is third person, the person marker co-varies with the subject.[10] In Béjar 2003, this is modeled as follows. Example (15) represents a case in which the object controls person agreement. The important detail is that ECP is satisfied (the probe features are a subset of the goal features), thus permitting an Agree relation.

[10] Note that the order of number and person markers is reversed when the subject controls person agreement. Béjar 2004 argues that this is an indirect consequence of person agreement occurring on different syntactic cycles of Agree in 3rd person contexts (see also Béjar in prep).

(15) Person agreement in first/second person object contexts

$$\begin{array}{llllllll} \ldots & \text{Subject} & \ldots & \text{Probe} & & \ldots & \text{Object} & \ldots \\ & \begin{bmatrix} \pi \\ \text{(participant)} \\ \text{(speaker)} \end{bmatrix} & & \begin{bmatrix} u\pi \\ u\text{participant} \end{bmatrix} & \subseteq & & \begin{bmatrix} \pi \\ \text{participant} \\ \text{(speaker)} \end{bmatrix} & \end{array}$$

Example (16) represents a case in which the subject controls person agreement. The important details are (a) that ECP is not satisfied between the probe and the direct object (the former person features are not a subset of the latter). Therefore, the probe remains active when the subject is merged and so the subject becomes the new goal (Section 5.4.4). If (b) the probe person features are a subset of those of the subject, then an Agree relation is established. If, however, (b′) the probe features are more contentful than those of the subject, then Agree fails. This arises when both subject and object are third person. Descriptively, what emerges in such cases is mere default agreement.

(16) Person agreement in third person object contexts

$$\begin{array}{lllllllll} \text{a.} & \ldots & \text{Subject} & & \ldots\ \text{Probe} & & \ldots\ \text{Object} & \ldots \\ & & \begin{bmatrix} \pi \\ \text{participant} \\ \text{(speaker)} \end{bmatrix} & & \begin{bmatrix} u\pi \\ u\text{participant} \end{bmatrix} & \not\subseteq & [\,\pi\,] & \end{array}$$

$$\begin{array}{lllllll} \text{b.} & \text{Subject} & & \ldots\ \text{Probe} & & \ldots\ \text{Object} & \ldots \\ & \begin{bmatrix} \pi \\ \text{participant} \\ \text{(speaker)} \end{bmatrix} & \supseteq & \begin{bmatrix} u\pi \\ u\text{participant} \end{bmatrix} & \not\subseteq & [\,\pi\,] & \end{array}$$

$$\begin{array}{lllllll} \text{b}'. & \text{Subject} & & \ldots\ \text{Probe} & & \ldots\ \text{Object} & \ldots \\ & [\,\pi\,] & \not\supseteq & \begin{bmatrix} u\pi \\ u\text{participant} \end{bmatrix} & \not\subseteq & [\,\pi\,] & \end{array}$$

Let us now consider Mordvinian number agreement, which is, in a particular sense, the converse of the person agreement pattern. Descriptively, the person pattern is this: when the object is a participant, agreement is not sensitive to the subject; when the object is third person, agreement is sensitive to the features of the subject. In other words, the object is the preferred controller of person agreement. The converse pattern, therefore, is for the subject to be the preferred controller, with the object becoming relevant only if the subject fails to Agree. I will now show that this is precisely what we see with respect to number agreement in the paradigm and that it follows simply from the current account.

The precise generalizations governing number agreement are these: when the subject is plural, number agreement is not sensitive to the object; when the subject is singular, agreement is sensitive to the object. To see this, observe that, in rows where the subject is plural, number marking tracks the subject and is invariant to the plurality of the object (*iź∼yź∼y*); however, in rows where the subject is singular, number marking covaries with the object (emerging as *iź∼yź∼y* if, and only if, the direct object is plural).

The fact that subject number agreement bleeds object number agreement is captured by positing a high structural locus for the number probe. This entails that the subject is the closest NP in the Agree domain. The details of the crucial cases are as follows. If the subject is plural, as in (17), then the probe features are a subset of the goal features and so an Agree relation is established. The search terminates, thus making the number specification of the object irrelevant. (As person features and probes are not immediately relevant, the examples explicating number exclude them.)

(17)
$$\begin{array}{lllll} \ldots\ \text{Probe} & & \ldots\ \text{Subject} & \ldots\ \text{Object} & \ldots \\ \begin{bmatrix} u\omega \\ u\text{plural} \end{bmatrix} & \subseteq & \begin{bmatrix} \omega \\ \text{plural} \end{bmatrix} & \begin{bmatrix} \omega \\ (\text{plural}) \end{bmatrix} & \end{array}$$

If, however, (a) the subject is singular, as in (18), the probe is not a subset of the subject, and so the search continues. If (b) the object is plural, then the probe is a subset of it, and an Agree relation is established. If (b′) the object is singular, then, again, the probe is not a subset and no Agree relation is possible. The result is plural agreement in the former case and default agreement in the latter.

(18) a.
$$\begin{array}{llllll} \ldots\ \text{Probe} & & \ldots\ \text{Subject} & \ldots & \text{Object} & \ldots \\ \begin{bmatrix} u\omega \\ u\text{plural} \end{bmatrix} & \subseteq & \begin{bmatrix} \omega \\ \text{plural} \end{bmatrix} & & \begin{bmatrix} \omega \\ (\text{plural}) \end{bmatrix} & \end{array}$$

b.
$$\begin{array}{llllll} \ldots\ \text{Probe} & & \ldots\ \text{Subject} & \ldots & \text{Object} & \ldots \\ \begin{bmatrix} u\omega \\ u\text{plural} \end{bmatrix} & \not\subseteq & [\,\omega\,] & \subseteq & \begin{bmatrix} \omega \\ \text{plural} \end{bmatrix} & \end{array}$$

b′.
$$\begin{array}{llllll} \ldots\ \text{Probe} & & \ldots\ \text{Subject} & \ldots & \text{Object} & \ldots \\ \begin{bmatrix} u\omega \\ u\text{plural} \end{bmatrix} & \not\subseteq & [\,\omega\,] & \not\subseteq & [\,\omega\,] & \end{array}$$

We thus see that the complexities of Mordvinian agreement yield straightforwardly to an analysis that respects the AON condition, but regards it as applying to person and number features as distinct probes, rather than to all φ-features as a whole. This demonstrates that sub-φ entities are legitimate

TABLE 5.8 Karok positive series pronominal agreement affixes

	1sgO	2sgO	3sgO	1plO	2plO	3plO
1sgS		nu- 2	ni- 1		ki-___-ap 2pl	ni- 1
2sgS	na- 1		'i- 2	kin- 1pl		'i- 2
3sgS	na- 1	'i-___-ap 2pl	'u- 3	kin- 1pl	ki-___-ap 2pl	'u- 3
1plS		nu- 2	nu- 1pl		ki-___-ap 2pl	nu- 1pl
2plS	ka-na- pl-1		ku- 2pl	kin- 1pl		ku- 2pl
3plS	ka-na- pl-1	'i-___-ap 2pl	kun- 3pl	kin- 1pl	ki-___-ap 2pl	kin- 3pl

Sources: Bright 1957, Macaulay 1992. Idiosyncratic forms are set aside (shaded). See Macaulay 1992 for a detailed analysis of the paradigm, with particular attention to these forms.

probes, and, moreover, that sub-φ probes may be independently active. Now, given the nature of Mordvinian agreement, the second point is somewhat trivialized: given that the person and number probes are on different heads, their independence is inevitable. A stronger test of the current proposal arises in a language in which both sub-φ probes are independent despite collocation on a single head. In this light, we turn to Karok.

5.5.2 *Karok*

Descriptively, Karok (a Hokan Language) differs from Mordvinian in one major regard: whereas Mordvinian has different preferred controllers for person agreement (the subject) and number agreement (the object), in Karok, the preferred controller is always the object. This means that both probes must be located between subject and object. Furthermore, if we assume that v is the only head available to person and number probes in this region of the clause, then it follows that they are collocated. Nevertheless, they do dissociate: the person and number probes can Agree with different arguments, resulting in partial agreement for both. Further evidence for their collocation comes from the specific form and linear order that agreement takes. Therefore, Karok supports the position that sub-φ probes act independently even when hosted by the same head.

Let us begin with person agreement. Descriptively, the generalization is the same as for Mordvinian: when the object is a participant, agreement is not sensitive to the subject; when the object is third person, agreement is sensitive to the features of the subject. Observe that, in Table 5.8, person is invariant in the first and second person columns, irrespective of variation in the subject. The derivation is exactly as for Mordvinian.

Number, in Karok, and unlike Mordvinian, follows the same pattern as person *mutatis mutandis*: when the object is plural, agreement is not sensitive to the subject; when the object is singular, agreement is sensitive to the features of the subject. This is evident when one compares quadrants in Table 5.8. For instance, first plural objects trigger *kin-* whether the subject is singular or plural; however, when the object is first singular, the form of agreement co-varies with plurality of the subject: *ka-na-* when there is a plural subject, plain *na-* otherwise. More generally, the quadrants are invariant for number when the object is plural. (Note that third plural objects also control number agreement: compare 3PLS>3SGO = *kun-* with 3PLS>3PLO = *kin-*. For all other subjects, however, there is no morphological exponent of the object agreement.)

The derivation proceeds as follows. If the object is plural, the probe is a subset of it, so an Agree relation can be established, leading to agreement with the object.

(19) $\ldots$ Subject $\ldots$ Probe $\ldots$ Object $\ldots$

$$\begin{bmatrix} \omega \\ \text{(plural)} \end{bmatrix} \quad \begin{bmatrix} u\omega \\ u\text{plural} \end{bmatrix} \subseteq \begin{bmatrix} \omega \\ \text{plural} \end{bmatrix}$$

Example (20) represents a case in which the subject controls number agreement. The ECP is not satisfied between the probe and the direct object (the latter number features are not a subset of the former). Therefore, the subject becomes the new goal when merged. If (b) the probe number features are a subset of those of the subject, then an Agree relation is established. If, however, (b′) the probe features are more contentful than those of the subject, the Agree fails. This arises when both subject and object are singular, and the result is default agreement.

(20) a. $\ldots$ Subject $\ldots$ Probe $\ldots$ Object $\ldots$

$$\begin{bmatrix} \omega \\ \text{(plural)} \end{bmatrix} \quad \begin{bmatrix} u\omega \\ u\text{plural} \end{bmatrix} \not\subseteq [\omega]$$

b. $\ldots$ Subject $\ldots$ Probe $\ldots$ Object $\ldots$

$$\begin{bmatrix} \omega \\ \text{plural} \end{bmatrix} \supseteq \begin{bmatrix} u\omega \\ u\text{plural} \end{bmatrix} \not\subseteq [\omega]$$

b′. … Subject … Probe … Object …

$$[\omega] \quad \not\supseteq \quad \begin{bmatrix} u\omega \\ u\text{plural} \end{bmatrix} \quad \not\subseteq \quad [\omega]$$

A variety of morphological evidence further supports the view that Karok exhibits independent person and number probes, but locates them on the same, rather than different, heads. Note that the exponents of person and number are sometimes fused and sometimes split (e.g., 3sgS>1plO = *kin-* vs. 3plS>1sgO = *ka-na-*). If person and number probes were on separate heads, the default expectation would be split exponence throughout the paradigm. Béjar (2003, 2004, in prep) demonstrates that split forms occur only when person and number fail to Agree with the same argument, which is precisely when the probe would reproject (either through head movement or projection itself; see Section 5.4.4) making multiple vocabulary insertion sites available to the morphology. Moreover, Harbour (this volume) examines cases of discontinuous versus fused agreement, and his analysis goes even further towards accounting for the distribution of person and number exponents. His principle claim is that whole φ-sets can be realized in two ways: as a single vocabulary item or as multiple vocabulary items. In the latter case, and only in that case, the two vocabulary items flank the verb. Instances in which one argument values both probes conform exactly to this pattern: either there is a single fused morpheme for both person and number (e.g., 1plO = *kin-*) or there are two morphemes that flank the verb (e.g., 2plO = *ki-…-ap*). Note that to apply Harbour's theory here, we must assume that the valued person and number probes form a single φ-set. This is reasonable as matching both simultaneously is tantamount to matching the whole φ-set of the goal. Where they are valued by separate goals, the two probes do not form a single φ-set, and, so, even if there are two morphemes, they will not flank the verb as they correspond, essentially, to two different heads. Indeed, if we assume that they are spelled out in the positions in which they are valued, then we correctly predict the order of prefixes. For instance, for 2plS > 1sgO (*ka-na-*), person is valued by the object and, so, is lower and nearer the verb (*-na-*), number is valued by the subject and, so, is higher and further from the verb (*ka-*). The ease with which the variety of these linearization facts falls out strongly supports the claim that the person and number probes, though independent, are indeed on the one head.

We therefore have stronger evidence for the claim that the AON condition may apply to sub-φ structures, independently of one another. Indeed, Karok shows that the probes may act independently, even though on the same head.

5.6 Conclusion

The Entailment Condition on Probes offers a formal solution to partial agreement that emerges naturally from the architecture of agreement without having to relegate partial agreement languages to a special class, subject to idiosyncratic rules or mechanics. The precise formulation of the condition shares features of earlier formulations of restrictions on Agree. It shares with the AON condition the idea that coherent sets of features must probe as wholes, not as individual features; and it shares with Defectivity the idea that Agree cannot be established between a probe–goal pair in which the goal is underspecified with respect to (is a proper subset of) the probe. This is important: partial agreement is prima facie a complete falsification of standard assumptions about Agree. However, it yields to an analysis that constitutes close conceptual kin to previous work. This strongly suggests that the Agree framework is, at heart, correct. The foregoing reformulations hopefully make it more so.

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6

Phi-Feature Competition in Morphology and Syntax

MARTHA McGINNIS

6.1 Dependent agreement

A long-standing problem in morphosyntax concerns the analysis of what I will call *dependent agreement*. Dependent agreement arises when a single position can show agreement with either of two arguments, depending on their relative properties.[1] Such cases can be divided into two classes. In *position-based dependent agreement*, the choice of which argument triggers agreement depends primarily on the relative syntactic positions of the arguments. This type of agreement is illustrated in the Yucatec Mayan perfect (1).[2] A suffix on the main verb preferentially indexes the internal argument, while the external argument triggers agreement on an aspectual auxiliary (1a). However, if there is no internal argument, the verb suffix instead indexes the external argument (1b–c), which in turn triggers no agreement on the auxiliary.

(1) a. t-**a** w-il-ah-**en**.
PF.TR-2SG PART-see-CPL-1SG
"You (SG) saw **me**."

b. h meyahn-ah-**en**.
PF.INTR work-CPL-1SG
"**I** worked."

c. h meyahn-ah-**etʃ**.
PF.INTR work-CPL-2SG
"**You** worked." (Wunderlich and Krämer 1999)

[1] The term *dependent agreement* is loosely based on Marantz's (1991) conception of *dependent case*, in which the morphological case of one argument depends on that of another.

[2] Morphological analysis and glosses have been simplified slightly.

In *feature-based dependent agreement*, by contrast, the choice of which argument triggers agreement depends primarily on the arguments' relative specifications for φ-features, such as animacy, person, or number. This type of agreement is seen in Algonquian personal prefixes, as illustrated in (2), from Ojibwa (Rhodes 1976). Here, the prefix on the verb preferentially indexes a second person (or inclusive) argument (*g*-) (2a,b). If there is no such argument, the prefix can index a first person argument (*n*-), if one is present (2c). Otherwise, the prefix can index a proximate third person argument (*w*-) (2d).

(2)	a.	g-biin-i[3] "You bring me."	g-biin-ini "I bring you."
	b.	g-biin-aa "You.SG bring him."	g-biin-igw "He brings you.SG."
	c.	n-biin-aa "I bring him."	n-biin-igw "He brings me."
	d.	w-biin-aa "He brings him.OBV."	w-biin-igw "He.OBV brings him."

The two types of dependent agreement have commonly been analyzed in the same way. Recent proposals give essentially the same analysis to feature-based dependent agreement in Algonquian person prefixes and position-based dependent agreement in Georgian person prefixes (Anderson 1992; Béjar 2003; Halle and Marantz 1993). However, I will argue that the two cases should be separated: position-based dependent agreement arises from competition for agreement in the syntax, while feature-based dependent agreement arises from morphological competition. Under this proposal, φ-feature competition can give rise to dependent agreement both in syntax and in morphology, but in crucially different ways.

The chapter is organized as follows. Section 6.2 introduces the theoretical accounts of syntactic and morphological φ-feature competition. Section 6.3 argues that Béjar's (2003) syntactic analysis of position-based dependent agreement in Georgian captures the correct generalizations, by contrast with a morphological analysis. Section 6.4 reviews Halle and Marantz's (1993) morphological analysis of feature-based dependent agreement in Algonquian prefixes, and argues that it is more successful than a syntactic analysis of these facts.

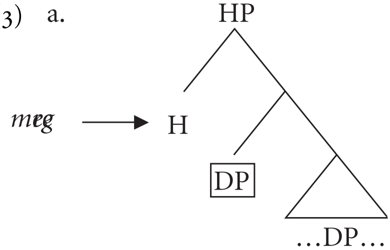
6.2 Syntactic and morphological φ-feature competition

Recent work within the Minimalist framework relates two distinctive characteristics of natural language, agreement and displacement, by attributing both to the presence of uninterpretable features on syntactic heads (Chomsky

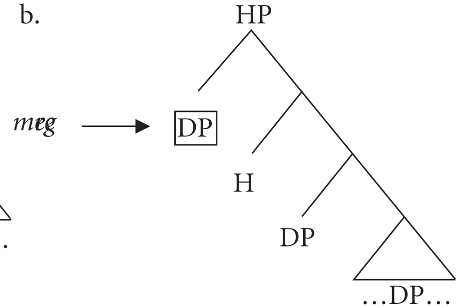
[3] Ojibwa data reflect Rhodes's (1976) morphological analysis.

1995). A head with uninterpretable features must enter a local relation with an appropriate phrase in order for the derivation to receive a complete interpretation. For example, a head with uninterpretable φ-features targets a DP with interpretable φ-features; a head with an uninterpretable EPP feature targets an XP that can move to its specifier. This approach incorporates a Shortest Move version of locality, by which a head targets the closest constituent with an appropriate set of features. Assuming that the derivation is constructed from the bottom up, the closest constituent to a head just merged into the structure will be the highest constituent c-commanded by the head (3a). There is also some evidence that once an element has merged as the specifier of a head, the head can probe this element (3b) as well (Řezáč 2003).

(3) a.



b.



Chomsky (2001) proposes that the uninterpretable φ-features generated on a syntactic head are generalized categories, such as person or number. When a head targets a DP, this Agree operation *values* (specifies) the φ-features of the head to match those of the DP—for example, a generalized number category may be valued as plural, or a generalized person category may be valued as first person. Béjar (2003) makes the intriguing proposal that syntactic heads can also be *generated* with fully or partly specified uninterpretable features. She argues that such pre-specified features give rise to dependent agreement.

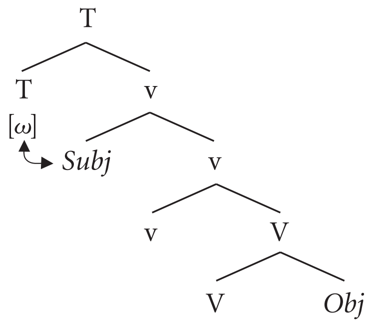
For example, suppose that a head H is generated with an uninterpretable feature F. If F is a generalized feature, it probes the closest constituent with interpretable F. For example, English verb agreement works like this: only the highest DP, which becomes the subject, can trigger person agreement on the tense morpheme.

(4) a. He like-s her/them.

b. They like(*-s) him.

This is expected if the highest argument below T both triggers agreement (5), and moves to the subject position.

(5)



Specified agreement has a broader scope: if the closest argument does not match the uninterpretable feature specifications of a head, the head can probe a second time. Georgian plural agreement works like this (6). T begins by probing the closest argument, just as in (5). If this argument is plural, T agrees with it (6a). If not, however, T can probe a second time. If the object is plural, T can agree with it (6b).[4] Otherwise, singular agreement is used (6c). Suffixal agreement with both arguments is impossible, so "They saw you (pl)" is *g-nax-es*, not **g-nax-es-t*.

(6) a. g-nax-**es**
2.DAT-see-AOR.3PL[5]
"**They** saw you (SG/PL)."

b. g-nax-a-t
2.DAT-see-AOR-PL
"(S)he saw **you (PL)**."

c. g-nax-a
2.DAT-see-AOR
"(S)he saw you (SG)."

In short, if uninterpretable features on heads play a role in syntactic movement and agreement, this raises the possibility of syntactic φ-feature competition. Under the approach outlined above, arguments compete to agree with a single φ-feature specification, with the most local argument winning the competition only in some cases.

[4] Matters are somewhat more complex than described here: an object can trigger plural agreement only if it is first or second person.

[5] Accusative and dative marking are morphologically identical in Georgian, so both will be called dative here. The main basis for distinguishing between them is their different alternations in the different tense/aspect series. For example, "accusative" datives become absolutive (i.e., nominative) in the aorist and optative tense/aspect series, while true datives remain dative.

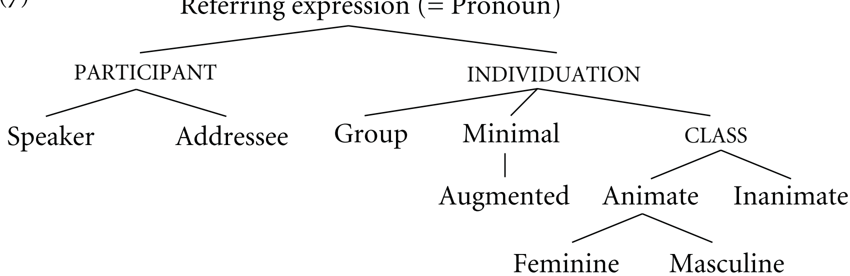
A more familiar notion of φ-feature competition can be found in late insertion theories of morphology, including Distributed Morphology (Halle and Marantz 1993). In this model, the terminal nodes of a syntactic structure are generated with fully specified syntactic/semantic features. When a syntactic derivation is transferred to the phonological component, underspecified vocabulary items compete for insertion into syntactic terminal nodes. Each vocabulary item consists of an array of morphosyntactic features associated with a phonological exponent. Items are ranked by the richness of their morphosyntactic feature specifications—where possible, according to the Subset Principle. The competition for insertion is won by the most highly ranked vocabulary item whose features are a subset of the features of the terminal node. In this context, then, φ-feature competition involves vocabulary items competing to discharge φ-features phonologically.

Halle and Marantz (1993) account for dependent agreement in Georgian and Algonquian by means of such morphological competition. Crucially, certain morphological operations can precede vocabulary insertion. For example, Halle and Marantz argue that subject and object pronouns undergo a Fusion operation, which fuses them into a single node, into which only one vocabulary item can be inserted. The choice of which argument triggers overt morphology then depends purely on the competition among vocabulary items.

I will argue below that both approaches to dependent agreement are empirically supported, but in different cases. Syntactic competition for agreement gives rise to position-based dependent agreement, while competition among vocabulary items gives rise to feature-based dependent agreement.

For the sake of concreteness in the following discussion, let me briefly outline a set of theoretical assumptions regarding the representation of φ-features. I assume that φ-features are represented according to a universal geometry like the one below (Harley and Ritter 2002):

(7)



I assume that agreement nodes can consist of partial geometries, such as Person (π) with a dependent [participant] feature, or Number (ω) with

TABLE 6.1 Person system with inclusive/exclusive distinction

	Person node	Semantic denotation	Example: Ojibwa pl. pronouns
a.	π | PART SPKR ADDR	All sets containing a speaker and an addressee	*kiinawint* "we (IN)"
b.	π | PART | SPKR	All other sets containing a speaker	*niinawint* "we (EX)"
c.	π | PART | ADDR	All other sets containing an addressee	*kiinawaa* "you (PL)"
d.	π	All other sets	*wiinawaa* "they"

dependent [group] and/or [minimal] features. A person system with an inclusive "you and I" category is shown in Table 6.1: a dually specified inclusive category, a first person (exclusive) category, a second person category, and a third-person category.[6]

Phi-features are specified contrastively: if a morphosyntactic contrast is missing from a language, the corresponding feature is absent. I will assume that in a three-person system, the [addressee] feature is absent, so that first person is most specified and third person least (McGinnis 2005). However, nothing in the discussion below hinges crucially on this assumption.

6.3 Position-based dependent agreement

Béjar's (2003) syntactic theory of φ-feature competition is uniquely well designed to account for position-based dependent agreement. For example, person-marking on Georgian verbs preferentially indexes an internal argument:

[6] This discussion of person features focuses on plural pronouns because this is where the Algonquian inclusive/exclusive distinction arises. To save space, only person specifications are shown in Tables 6.1 and 6.2, but I assume that plural pronouns in both Ojibwa and English also have a [group] specification under the Number node.

TABLE 6.2 Person system without inclusive/exclusive distinction

	Person node	Semantic denotation	Example English pl. pronouns
a.	π | PART | SPKR	All sets containing a speaker	*we*
b.	π | PART	All other sets containing an addressee	*you*
c.	π	All other sets	*they*

(8) a. **m**-xedav "You see **me**."
b. **m**-xedav-s "S/he sees **me**."
c. **g**-xedav "I see **you**."
d. **g**-xedav-s "S/he sees **you**."

If no internal argument is available, person-marking can index the external argument instead:

(9) a. **v**-mušaob "**I** work."
b. **Ø**-mušaob "**You** work."

It is impossible for both arguments to trigger an agreement prefix, so "I see you" is *g-xedav*, not **g-v-xedav*. Like the cases of number agreement discussed above, this pattern of person agreement is clearly sensitive to syntactic locality. Here, however, it is the internal argument, not the external argument, that is preferentially targeted by Agree. Béjar argues that in such cases, the locus of agreement is *v*, rather than T.

The person-marking prefix in Georgian is sensitive not only to locality, but also to featural properties of the arguments involved. The prefix registers agreement only with first or second person arguments—those with a [participant] feature:[7] If the internal argument is third person, the prefix shows agreement with the external argument:[8]

[7] A third person indirect object (true dative) can also be associated with the prefixes *u-* or *s-/h-* (Aronson 1990: 173–4), but these prefixes are clearly not in the same position as the Participant prefix, since they can combine with it: note *ga-v̲-u̲-gzavni* "I will send it to him," *mi-v̲-s̲-c'er* "I shall write him," *v̲-h̲-k'itxav* "I shall ask him."

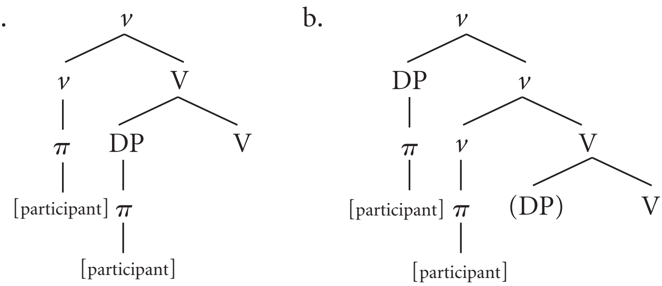
[8] If there are two internal arguments, matters are slightly more complex. An appropriate indirect object can trigger the Participant prefix. However, if the indirect object is third person, a direct object

(10) a. **v**-xedav-s “**I** see him/her.”
b. **Ø**-xedav-s “**You** see him/her.”

Béjar proposes that the person-marking prefix reflects agreement with an uninterpretable person category specified for the feature [Participant].

The *v* head begins by probing downward for a Participant argument. If there is a local Participant, it triggers agreement on *v* (11a). Otherwise, *v* can probe again, on the next step of the derivation—in this case, the merging of the external argument. If the external argument is a Participant, then it triggers person agreement (11b). Otherwise, null default agreement is inserted.

(11) a. b.



According to this analysis, only one argument can trigger a Participant prefix because there is only one person feature on *v*. Its specifications will be determined by those of the highest internal argument, if it is a Participant, and otherwise by those of the external argument. The choice of which argument will trigger agreement is determined syntactically, by locality. Of course, the pronunciation of this agreement depends on other factors as well. For example, the prefixes *m*- “1SG”, *gv*- “1PL” and *g*- “2” are associated with dative arguments, while *v*- “1” and Ø- “2” are associated with nominative arguments.

can trigger the Participant prefix only in some cases (Léa Nash, personal communication). If the applicative morpheme is *a*-, the result is fine (i) (pace Harris 1981), but if it is *u*-, the result is a **me-lui* effect (ii) (Bonet 1991). In this case, a Participant direct object can be expressed using a reflexive form (e.g., *šeni tavi* “yourself”), which is formally third person; the same applies when both internal arguments are Participants.

(i) vano-m šen givi-s se-g-a-dara
Vano-ERG you Givi-DAT PREV-2DAT-APPL-compare.AOR
“Vano compared you to Givi.”

(ii) *vano-m šen g-u-ko direkt’or-s
Vano-ERG you 2.DAT-APPL-praise.AOR principal-DAT
“Vano praised you to the principal’

I assume that these choices depend on the competition among vocabulary items.[9]

By contrast, Halle and Marantz (1993) argue that vocabulary competition determines not only how agreement is pronounced, but also which argument is indexed by agreement. They propose that Participant arguments fuse morphologically into a single syntactic node that comprises features of both arguments.[10] The vocabulary items in (12) then compete for insertion. The dative items happen to be more specified than their nominative counterparts, so agreement preferentially reflects the features of the dative argument, if one is present:

(12)	a.	[+1 +dative +plural]	⇔	/gv-/
	b.	[+1 +dative]	⇔	/m-/
	c.	[+2 +dative]	⇔	/g-/
	d.	[+1]	⇔	/v-/
	e.	[+2]	⇔	/Ø-/

While this analysis correctly captures the facts, it fails to capture the generalization that the first three items correspond to the Participant argument that is structurally closest to *v* when two Participant arguments are in principle eligible for agreement. There is nothing to rule out an alternative such as the one in (13), by which a dative argument would trigger the prefix only (i) if it were first person plural, or (ii) if there were no nominative Participant argument in the clause; otherwise, a nominative argument would trigger the prefix.

(13)	a.	[+1 +dative +plural]	⇔	/gv-/
	b.	[+1 +nominative]	⇔	/v-/
	c.	[+2 +nominative]	⇔	/Ø-/
	d.	[+1]	⇔	/m-/
	e.	[+2]	⇔	/g-/

[9] Béjar argues that the pronunciation of agreement derives from cyclicity: the "dative" clitics reflect Agree on the first probe, while the "nominative" set reflects Agree on the second probe. A challenge for this view is that while an unaccusative clause may have a single dative argument (Aronson 1990: 344), as predicted, it more commonly has a single nominative argument. I leave the matter for further research.

[10] The fused features must nevertheless remain in separate bundles, given that the [+plural] feature of a nominative argument cannot combine with the [+1] and [dative] features of a first person singular dative argument to allow the insertion of *gv-* (12a). This requirement could follow from the assumption that a vocabulary item is a single subtree of the feature geometry of the node it spells out (Bonet 1991). I leave a fuller exploration of this approach for further research.

According to Béjar's analysis, syntactic locality determines which argument is indexed by agreement. Thus it is no coincidence that the closest Participant argument preferentially triggers person agreement on *v*. Under this approach, a vocabulary list like the one in (13) would yield exactly the same results as the one in (12); as long as the dative clitics block each other, and the nominative clitics block each other, the order of dative clitics relative to nominative clitics is not crucial.[11]

6.3.1 *Evidence for the syntactic competition analysis*

A methodological advantage of the syntactic approach is that it makes structural predictions that can be tested against a broader range of evidence than is possible for the vocabulary competition approach. If these predictions are correct, they provide further support for the syntactic analysis.

For example, if we take seriously the view that *v* preferentially agrees with the closest Participant argument, this makes predictions concerning the structure of Georgian clauses with a dative subject. These clauses fall into two main classes: clauses with an Experiencer subject, and clauses in the perfect or pluperfect tense/aspect series. In both cases, person agreement preferentially targets the dative argument. Consider first the Experiencer-subject case. In this case, if there are two Participant arguments, the subject triggers agreement, rather than the object (14). This is also the case if there is only a lone Experiencer argument.

(14) a. **m**-i-q'var-xar
1DAT-APPL.PART-love-2
"**I** love you."

b. **m**-i-q'var-s
1DAT-APPL.PART-love-3
"**I** love him/her/them."

c. **g**-i-q'var-var
2DAT-APPL.PART-love-1
"**You** love me."

[11] Note that the ordering of dative items above nominative items cannot be derived from a claim that nominative arguments lack case, since nominative case is morphologically marked on Georgian nouns (*-i*). At first glance, the fact that "nominative" prefixes are also used for ergative subjects in the aorist tense/aspect series suggests that these vocabulary items have no case specification. However, two points should be noted in this context. First, there is in fact no morphological distinction between nominative and ergative in the Participant forms; indeed, Nash (1995) argues that only third person arguments are ergative. Second, third person plural agreement with a nominative *or ergative* argument blocks dative plural agreement on verbs (see (6a) above). This suggests that nominative and ergative case share some feature F, which logically could be deployed in the personal prefixes as well.

d. **g**-i-q'var-s
2DAT-APPL.PART-love-3
"**You** love him/her/them."

On the other hand, if the Experiencer is a third person argument, a Participant object can trigger prefixal agreement:

(15) a. **v**-u-q'var-var
1NOM-APPL-love-1
"S/he loves **me**./They love **me**."

b. Ø-u-q'var-xar
2NOM-APPL-love-2
"S/he loves **you**./They love **you**."

If case alone determined which argument triggered agreement, the only conclusion that could be drawn is that Experiencer subjects have dative case, which is manifestly correct. However, if locality determines which argument triggers agreement, the facts above predict that an Experiencer subject is generated lower than an agentive subject. Specifically, if agentive subjects are generated in the specifier of *v* P, Experiencer subjects must be generated below *v*.

According to the Uniformity of Thematic Alignment Hypothesis (Baker 1988), arguments with the same thematic role are always generated in the same syntactic positions. This hypothesis implies that arguments with different thematic roles are generated in different syntactic positions. A similar hypothesis is that thematic roles are determined configurationally, by the position an argument occupies relative to other syntactic categories (Hale and Keyser 1993, 2002). However, the notion of "position" is somewhat flexible: both of these hypotheses leave open the possibility, for example, that different types of *v* can license different types of external argument specifiers. Indeed, Arad (1999) argues that stative *v* licenses an Experiencer, while eventive *v* licenses an Agent. However, if the line of argument pursued above is correct, Georgian prefix agreement predicts that Experiencer subjects are generated below *v*.

As it turns out, this prediction is supported by both crosslinguistic and language-internal evidence. One type of crosslinguistic evidence is the familiar observation that an Experiencer can act as a subject (*X likes/hates/fears Y*) or as an object (*Z pleases/disgusts/frightens X*). Pesetsky (1995) argues that this possibility arises because the other argument (Y or Z) has distinct thematic roles in the two cases: a Target or Subject Matter role in subject-Experiencer clauses, and a Causer role in object-Experiencer clauses. If the Causer role is assigned to the specifier of *v*P, then the Experiencer role must be assigned below the specifier of *v*P, assuming that there is only one *v* per (simple) clause.

Further crosslinguistic evidence that a dative Experiencer is not an external argument comes from Kannada reflexive morphology. In a transitive clause with a nominative subject, a binding relation between the external and internal arguments is obligatorily indicated by reflexive morphology (*-koḷḷ*/*-koṇḍ*)[12] on the verb, and optionally by the appearance of an independent anaphoric argument (16a). The morpheme *-koḷḷ* has a non-reflexive use that arises in some unaccusative clauses, but in its reflexive use *-koḷḷ* is always associated with an external argument. A binding relation between two internal arguments can be indicated only by an anaphoric argument (16b), and reflexive *-koḷḷ* cannot appear in an unaccusative clause, which lacks an external argument (see Lidz 1996 and references therein). Interestingly, *-koḷḷ* also cannot be used in a clause with a dative subject: in (16c), as in (16b), the binding relation must be indicated by an anaphoric argument.[13] This suggests that the dative subject is not an external argument, and that, like the dative object in (16b), it is projected below *v*.

(16) a. avan-u (tann-annu)
he-NOM self-ACC
*hoḍe-da/hoḍe-du-koṇḍ-a.
beat-PST3SG.MASC/beat-PPL-REFL.PST-3SG.MASC
"He beat himself." (Amritavalli 2000: 53)

b. naan-u siite-ge avaḷ-ann-ee tooriside.
I-NOM Sita-DAT she-ACC-EMPH show.PST1SG
"I showed Sita to herself." (Amritavalli 2000: 56)

c. rashmi-ge taan-u
Rashmi-DAT self-NOM
ishta-aad-a/*ishta-aad-du-koḷḷ-utt-aaḷe.[14]
like-INCH-NPST3SG.MASC/like-INCH-PPL-REFL.NPST-3SG.FEM
"Rashmi likes herself." (Lidz 2001: 335)

Georgian verbal morphology provides independent language-internal evidence that Experiencer subjects are generated below *v*. Experiencer subjects are associated with an applicative morpheme *i-/u-*, seen in (14) and (15) above. This morpheme is also associated with indirect objects, as shown below.[15]

[12] The *koṇḍ-* form is used in the past tense, while *koḷḷ-* is used in non-past contexts.

[13] Lidz does not discuss gender in (16c). I assume that the verb does not (fully) agree with a dative subject, hence the masculine agreement.

[14] The glosses have been somewhat simplified.

[15] Aronson (1990) treats the applicative *i-/u-* morpheme purely as dative agreement, but this is somewhat misleading, as it cooccurs with the dative agreement prefix in first and second person. It is

(17) a. da-malav-s
PREV-hide-3
"S/he is hiding it."

b. da-**u**-malav-s
PREV-APPL-hide-3
"S/he is hiding it from him/her."

c. da-m-**i**-malav-s
PREV-1DAT-APPL.PART-hide-3
"S/he is hiding it from me."

The indirect object is clearly generated below the external argument: the external argument can bind a reflexive indirect object (18a). This binding relation cannot be reversed (18b).

(18) a. nino tavisi tav-s simartle-s u-ġiar-s.
Nino.NOM self.GEN self-DAT truth-ACC APPL-reveal-3
"Nino revealed the truth to herself."

b. *nino-s tavisi tav-i simartle-s u-ġiar-s.
Nino-DAT self.GEN self-NOM truth-ACC APPL-reveal-3
("Herself revealed the truth to Nino.")

The fact that Experiencer subjects and indirect objects are associated with the same applicative morpheme suggests that they are generated in the same position: in the specifier of an applicative head (Marantz 1989). If so, then the Experiencer, like an indirect object, is generated lower in the structure than an Agent in the specifier of *v*P. This evidence again supports the claim that the person-marking prefix in Georgian preferentially targets the highest argument below *v*—in this case, the Experiencer subject.

The subject is also preferentially targeted in the perfect and pluperfect tense/aspect series, as illustrated in the perfect forms below:

(19) a. **m**-i-naxav-xar
1DAT-APPL.PART-see-2
"**I** have seen you."

b. **m**-i-naxav-s
1DAT-APPL.PART-see-3
"**I** have seen him/her/them."

also notably absent in some verbs that select lexical datives; for example, "S/he will give it to me" is *mo-m-cems*, not *mo-m-i-cems* (Léa Nash, personal communication).

c. **g**-i-naxav-var
2DAT-APPL.PART-see-1
"**You** have seen me."

d. **g**-i-naxav-s
2DAT-APPL.PART-see-3
"**You** have seen him/her/them." (Carmack 1997: 331)

If the dative subject is third person, a Participant object can trigger prefixal agreement:

(20) a. **v**-u-naxav-var
1NOM-APPL-see-1
"S/he has seen **me**./They have seen **me**."

b. **Ø**-u-naxav-xar
2NOM-APPL-see-2
"S/he has seen **you**./They have seen **you**."

It is interesting to note that the dative subject of a perfect or pluperfect in Georgian is also associated with the applicative morpheme *i-/u-*. Under the analysis sketched above, this predicts that such a subject is generated below *v*, just like an Experiencer subject or an indirect object. At first glance, the prediction seems unlikely to be correct: the thematic role of the subject is generally assumed to be identical, regardless of the tense/aspect properties of the clause. If the thematic roles of the arguments are the same in all tense/aspect series, surely their syntactic positions are identical: an argument generated in the specifier of *v*P in the present tense must also be generated in the same place in the perfect.

In fact, this conclusion does not necessarily follow. There is considerable evidence that the same thematic role can be assigned in different configurations. For example, a *by*-phrase in a passive clause has the same thematic role as the external argument of the corresponding active, yet binding evidence shows that the *by*-phrase, unlike the external argument, is c-commanded by VP-internal PPs (Pesetsky 1995). According to Marantz (1997), derived nominalizations constitute a similar case. The external argument of a verb (21a) can receive the same interpretation as the possessor of the corresponding derived nominalization (21b). In the first case, the argument is generated in a specifier of the verbal functional head *v*. In the second case, Marantz argues, there is no *v*: *destruction* is a noun, not a verb.[16]

[16] However, see Fu et al. (2001) and Alexiadou (2001) for arguments that derived nominalizations do contain a verbal projection.

(21) a. **The army** destroyed the city.

b. **the army's** destruction of the city

According to Marantz, *destroy* and *destruction* share a category-neutral root $\sqrt{destr}$, merged in the syntax (see also Pesetsky 1995). *Destroy* is a verb because the root combines with *v*, while *destruction* is a noun because the root combines with D (or *n*). The agentive interpretation of *the army* in (21b) is licensed not by an agentive *v*, but by the root itself, which implies an external cause or agent. By contrast, an agentive interpretation for the external argument of a root denoting an internally caused change of state, such as *grow*, can be licensed only by means of an agentive *v*; the root itself does not license an agentive interpretation for a possessor (Chomsky 1970):[17]

(22) a. **John** grew tomatoes.

b. ***John's** growth of tomatoes

If this proposal is correct, then it is logically possible that the interpretation of the dative external argument in the Georgian perfect is also licensed by the verb root itself, rather than by an agentive *v*. The issue, then, is whether there is any independent evidence to support this view.

Massey (1991) provides evidence from Albanian that agentive subjects of perfect and non-perfect clauses are generated in different positions. This argument relies in part on the observation that Albanian, like English, uses the same participle for perfect and passive clauses. In the active perfect, the participle combines with the auxiliary *kam* "have" (23a). In the passive, this participle combines with the auxiliary *jam* "be" (23b). In addition to the analytic passive, Albanian also has a synthetic passive (23c). This nonactive form also allows a reflexive interpretation. The analytic passive, however, never allows a reflexive interpretation.[18]

(23) a. Drita ka goditur Agimin.
Drita.NOM have.3SG.PRES hit.PPL Agim.ACC
"Drita has hit Agim."

b. Drita është goditur.
Drita.NOM be.3SG.PRES hit.PPL
"Drita was/has been hit."

[17] A similar approach, noted by a reviewer, is that causative *grow* is derived from inchoative *grow* by affixing a phonologically null suffix, which prevents affixation of the *-th* nominalization morphology.

[18] Similar facts can be observed in Georgian, which also has synthetic and analytic passives, with the synthetic form also used for reflexives (Nash 1995).

c. Agimi lahet.
Agim.NOM wash.3SG.PRES.NACT
"Agim is/has been washed." / "Agim washes/is washing himself."

Massey observes that the availability of the reflexive and passive interpretations is crucially related to aspectual properties of the clause: a passive interpretation is always perfect, and a perfect interpretation is never reflexive. Thus, the reflexive interpretation is ruled out, not only by the analytic form, which is inherently perfect, but also by the synthetic form, when it receives a perfect interpretation. Massey suggests that this incompatibility arises because a perfect stem itself cannot project an external argument in the syntax, except as a *by*-phrase (*prej*-phrase, in Albanian): if the *by*-phrase is omitted, the external argument is implicit, not syntactically projected (see also Embick 1997). However, the reflexive interpretation crucially requires a verb phrase that projects an external argument; clitic/affixal reflexives are incompatible with unaccusatives and passives, even those with two internal arguments that could form a referential dependency (McGinnis 2004; Pesetsky 1995; Rizzi 1986).[19] It follows that a perfect stem, with no external argument, will disallow the reflexive interpretation, which requires an external argument.[20] The analytic passive contains an inherently perfect stem, so it never permits the reflexive interpretation. On the other hand, the synthetic nonactive is structurally ambiguous: one structure has a perfect stem, and disallows the reflexive interpretation (24a), while the other has a non-perfect stem, and requires this interpretation (24b).[21]

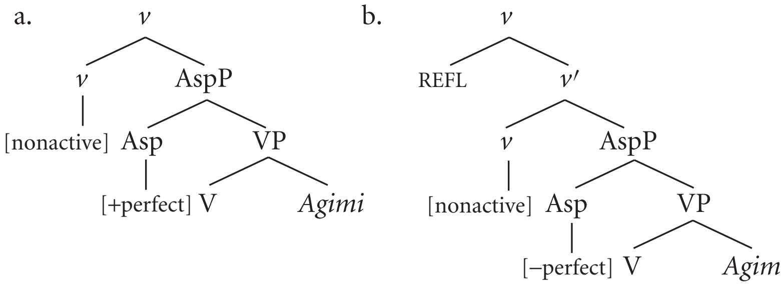
What prevents the perfect from projecting an external argument? For the participial forms, one possibility is that perfect participles do not contain *v*. This view is supported by Iatridou et al.'s (2001) arguments that perfect participles are dominated by a nominal projection, which is in turn dominated by a projection of the auxiliary verb *be*. A simplified version of Iatridou et al.'s representation is given in (25).

[19] See Arad (1999) for an analysis of an intriguing exception to this generalization—apparently unaccusative verbs like *piacere* "please/like" in Italian, which can combine with reflexive *si*.

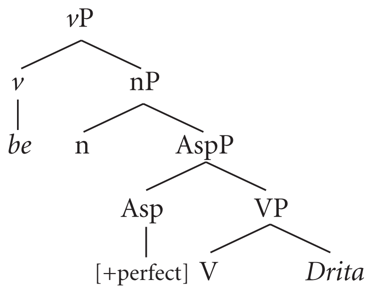
[20] A potential problem for this analysis is that it predicts that clauses with an Experiencer subject cannot be reflexive, since it is argued above that Experiencer subjects are not true external arguments. This prediction is not completely confirmed. For example, in Italian, verbs with a nominative experiencer subject like *temere* "fear" can be reflexivized (*Gianni si teme* "John fears himself"). One possibility is that these nominative experiencers, unlike dative experiencers, are generated in the specifier of *v*P. Nominative experiencer subjects in Georgian (e.g., with *naxav* "see") also behave morphosyntactically like nominative agentive subjects.

[21] I have modified Massey's structures to reflect a more contemporary phrase-structure theory.

(24)



(25)



If the nominal head incorporates into *be*, it forms the auxiliary *have* (Kayne 1993). Iatridou et al. argue that this incorporation also prevents the participle from forming a reduced relative clause, on the assumption that reduced relatives must be nominal. Their analysis captures the generalization that perfects formed with *be* can form reduced relatives, while those formed with *have* cannot. For example, in Bulgarian, active perfects are formed with *be*, so they can form reduced relatives:

(26) Zapoznah se sûs ženata [napisala knigata].
met.1SG REFL with the woman written.ACT.PPL.FEM.SG the book
"I met the woman (who has) written the book."

In English, active perfects are formed with *have*, so the English version of (26), **I met the woman written the book*, is impossible. A passive interpretation is possible, as in *I met the woman (who was) written a letter*; here, however, the auxiliary is *be*.

Suppose, then, that a perfect participle is dominated by a nominal projection, rather than by the *v* projection that would thematically license an external argument. Where, then, does the external argument of the active perfect originate? One possibility is that it is generated in the specifier of the auxiliary *v* (Cowper 1989; Hoekstra 1984; Roberts 1986). This approach is most plausible in languages like Dutch and Italian, where one auxiliary ("have") is used for perfects with an external argument, and another ("be") for the perfects without one; however, the approach is more difficult to maintain in languages like English or Spanish, where all active perfects use "have", or like Bulgarian, where all perfects use "be".

Another possibility is that even active perfects never project an external argument. One piece of evidence for this view is that a perfect clause cannot be passivized (27a). According to Iatridou et al. (2001), there are no known counterexamples to this generalization. Given that clauses with a derived subject generally cannot be passivized, the impossibility of (27a) suggests that an active perfect like *The police have arrested John* has a derived subject, not an external argument. On the other hand, a perfect participle can easily be formed from a verb phrase that lacks an external argument, so there is no problem with basing a perfect on a passive (27b).

(27) a. *John was had arrested

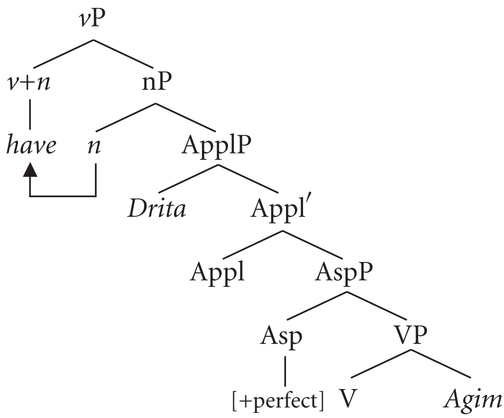
b. John has been arrested.

If this line of argument is correct, then what appears to be an external argument in the perfect is actually generated as an internal argument. As noted above, a Georgian perfect has the same applicative prefix *i-/u-* that appears in clauses with an indirect object. This suggests that the subject of an active perfect is projected as the specifier of an applicative head, as in (28). This head relates the dative argument to the state described by the perfect participle; the argument should then be interpreted as the possessor or Experiencer of this state. To the extent that the subject of a perfect clause receives the same interpretation as the external argument of its non-perfect counterpart, this can be attributed to the inherent meaning of the lexical root of the perfect participle.

The dative Experiencer subject, then, would not be an external argument; instead, it would simply be the argument closest to the syntactic subject position (say, specifier of TP). This conclusion supports the claim that prefixal agreement in Georgian preferentially targets the highest argument below *v*.

The above discussion lays out several types of evidence for the proposed syntactic competition analysis of the Georgian Participant prefix. While many issues remain to be investigated, this analysis clearly makes a number of correct empirical predictions that are not associated with the vocabulary competition analysis, where all that matters for prefixal agreement is the case of the arguments involved, not their syntactic positions. Given that the syntactic competition analysis is supported by both crosslinguistic and language-internal evidence, it is to be preferred.

(28)



6.4 Feature-based dependent agreement in Algonquian

Dependent agreement is also seen in Algonquian languages, where a verbal prefix can index the person features of either the subject or the object, but not both. Here, however, the prefix shows no positional preference for the subject or the object. The choice as to which argument will trigger prefixal agreement depends primarily on the person features of the two arguments. For example, in Ojibwa, if either the subject or the object is inclusive or second person, the prefix *g-* is used (29a–d) (data from Rhodes 1976). Otherwise, if either the subject or object is first person, the prefix *n-* is used (29e,f). If the clause has two third person arguments, the prefix *w-* is used (29g,h). Note that two prefixes cannot be combined, so "I bring you" is *g-biin-ini*, not **g-n-biin-ini*.

(29)

a.	**g**-biin-i	"**You** bring me."	b.	**g**-biin-ini	"I bring **you**."
c.	**g**-biin-aa	"**You** bring him."	d.	**g**-biin-igw	"He brings **you**."
e.	**n**-biin-aa	"**I** bring him."	f.	**n**-biin-igw	"He brings **me**."
g.	**w**-biin-aa	"**He** brings him.OBV."	h.	**w**-biin-igw	"He.OBV brings **him**."

Halle and Marantz (1993) propose that this pattern of agreement arises from competition among vocabulary items inserted into a single syntactic node bearing the features of proximate subject and object pronouns. For Halle and Marantz, proximate arguments include first and second person arguments, as well as third person proximates—that is, non-obviative third person arguments with a third person obviative clausemate argument. Bruening (2001) provides binding evidence from Passamaquoddy that proximate arguments undergo A-movement to a position high in the clause. According to Halle and Marantz, proximate subject and object pronouns raise out of *v*P and fuse morphologically to form a single node. This fused node is subject to insertion of a single vocabulary item. The choice of which item is inserted depends entirely on the features of the fused node, and the ranking of vocabulary items according to their featural specifications. For example, the items in (30) yield the desired result: if the clause contains an inclusive or second person argument, the fused node will have the feature [addressee]. If not, but the clause contains a first person argument, the fused node will have the feature [participant]. If not, the node will be spelled out with the default proximate item *w*-. Note that the feature for *n*- is given as [participant] rather than [speaker] because this allows the items to be ranked without additional stipulation, by Pāṇinian disjunctivity. Since all syntactic representations with an [addressee] feature have a [participant] feature, but not vice versa, [addressee] is more specific than [participant], and thus more highly ranked.

(30) Person Clitic (Ojibwa)
/g-/ ⇔ [addressee]
/n-/ ⇔ [participant]
/w-/⇔ elsewhere

Under this approach, it makes no difference whether a proximate pronoun is a subject or an object. Whether it is overtly realized or not depends purely on its person features and those of the other argument.

Number agreement with proximate arguments in Algonquian is also feature-based, rather than position-based. In most Algonquian languages, number agreement preferentially indexes a first person or inclusive plural argument, regardless of whether it is the subject or the object. If the clause contains no such argument, then number agreement can index a second person plural argument—but, again, it cannot index both, so "You (pl) bring us" is *g-biin-i-min*, not **g-biin-i-min-mw*.

(31)	a.	g-biin-i-**min**	"You (sg/pl) bring **us** (**ex**)."
	b.	g-biin-ini-**min**	"**We** (**ex**) bring you (sg/pl)."
	c.	g-biin-ini-**mw**	"I bring **you** (**pl**)."
	d.	g-biin-i-**mw**	"**You** (**pl**) bring me."
	e.	g-biin-i	"You (sg) bring me."

The pattern can be captured if this number agreement node agrees in person and number with the fused proximate arguments (Halle and Marantz, 1993).[22] Vocabulary items then compete for insertion into this position. The agreement facts in Ojibwa can be captured with the following vocabulary items, where the first person items are higher than the second person items.

(32) PERSON/NUMBER ITEMS (OJIBWA)[23]

/min/ ⇔ [group, speaker]
/mw/ ⇔ [group]
Ø ⇔ elsewhere

Not all Algonquian languages show a preference for first person plurals. In Swampy Cree, the number agreement suffix preferentially indexes a second person plural argument (33a,b) (Déchaine 1999; Ellis 1983). First person plural agreement can appear only in the absence of second person plural (33c,d). In such a language, the highest-ranked plural suffix would be specified with [addressee], not with [speaker].

(33) a. ki-waapam-iti-**naawaaw** "I/we see **you (PL)**."
b. ki-waapam-i-**naawaaw** "**You (PL)** see me/us (EX)."
c. ki-waapam-i-**naan** "You (SG) see **us (EX)**."
d. ki-waapam-iti-**naan** "**We (EX)** see you (SG)."

By this account, there is no competition between the subject and object for syntactic agreement: the features of both proximate arguments are present in the fused clitic node, and both arguments trigger syntactic person and number agreement on the verbal suffix. The choice of which argument is indexed by the vocabulary items is determined purely morphologically.

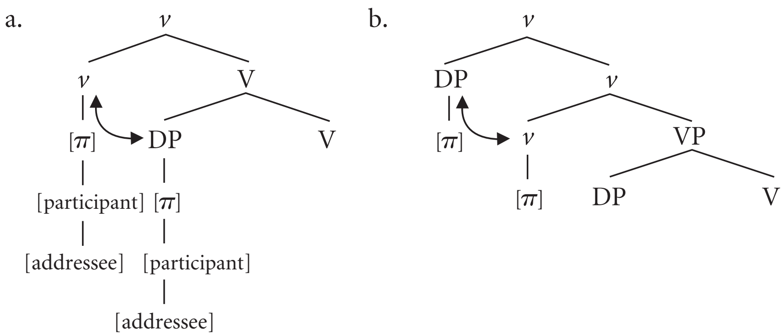
This account can be contrasted with the view that the choice of person and number agreement morphemes in Algonquian is determined by competition for agreement in the syntax, as argued above for person marking in Georgian. Béjar (2003) argues that Ojibwa person prefixes reflect agreement with a *v* node specified with the uninterpretable feature complex [π [participant [addressee]]]. If the highest argument below *v* is an Addressee, the Agree operation will succeed (34a). Otherwise, the [participant [addressee]]

[22] As noted by a reviewer, it has been proposed that certain argument combinations can be blocked when a single head agrees with two arguments, yielding person-hierarchy effects (Anagnostopoulou 2003; Nichols 2001). One such effect is described below for the Algonquian language Nishnaabemwin (see (46)).

[23] This is only a partial list. The reader is referred to Halle and Marantz (1993) and McGinnis (1995) for more extensive discussion of vocabulary competition in Algonquian languages.

specifications will delete, and *v* will Agree with the external argument when it merges into the structure (34b).

(34)



This analysis predicts that if the object is second person, the personal prefix will reflect its features (35a–b); otherwise, it will reflect the features of the external argument (35c–e).

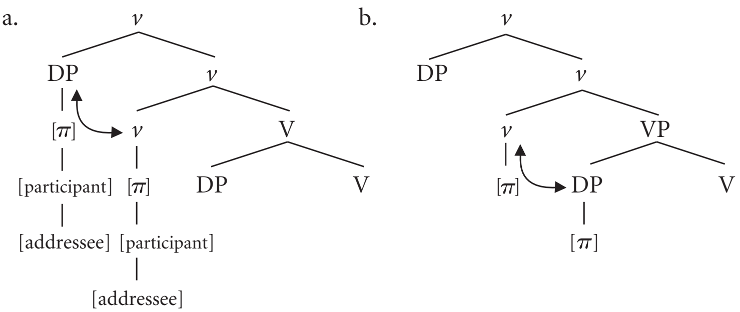
(35)	a.	**g**-biin-ini	"I bring **you**."
	b.	**g**-biin-igw	"He brings **you**."
	c.	**g**-biin-i	"**You** bring me."
	d.	**g**-biin-aa	"**You** bring him."
	e.	**n**-biin-aa	"**I** bring him."

An apparent counterexample to this prediction is seen in (36a), where the object is not an addressee, yet the personal prefix reflects its features. Béjar proposes that third person arguments have no π feature at all. As a result, the uninterpretable [π] feature on *v* can target only the first person internal argument in (36a). In (36b–c), no arguments can trigger Agree, so default person agreement appears.

(36)	a.	**n**-biin-igw	"He brings **me**."
	b.	**w**-biin-igw	"He.OBV brings **him**."
	c.	**w**-biin-aa	"He brings him.OBV."

One curious property of the Algonquian facts, on this analysis, is that the cyclicity effect is completely reversible. Suppose, for the sake of argument, we run the Agree procedure backwards: if the external argument is second person, it will trigger Agree on *v* (37a); otherwise, *v* will agree with an internal argument, if any (37b).

(37)



This analysis predicts that if the subject is second person, the personal prefix will reflect its features (38a–b); otherwise, it can reflect the features of the internal argument (38c–e). Again, (38f) would be permitted under the assumption that third person arguments cannot trigger Agree on *v*.

(38)	a.	**g**-biin-i	"**You** bring me."
	b.	**g**-biin-aa	"**You** bring him."
	c.	**g**-biin-ini	"I bring **you**."
	d.	**g**-biin-igw	"He brings **you**."
	e.	**n**-biin-igw	"He brings **me**."
	f.	**n**-biin-aa	"**I** bring him."

In short, the analysis by which cyclicity proceeds from internal to external arguments makes exactly the same predictions as the analysis by which cyclicity proceeds from external to internal arguments. Clearly, then, there is no empirical reason to treat dependent person agreement in Algonquian as position-based; if it were, then the status of an argument as internal or external should play a crucial role in determining whether it has its features spelled out morphologically. Instead, the choice of which argument's features are spelled out morphologically is determined entirely by the person features of the arguments. No locality generalization is missed if the choice is determined by vocabulary competition.

Moreover, Halle and Marantz's vocabulary competition analysis captures certain generalizations that are not captured by the syntactic competition analysis. One concerns inclusive ("you and me") arguments. As we have seen in (35a,c) and (38a,c), the Addressee prefix, *g*-, is generally preferred over the first person prefix, *n*-, when the prefix items compete for insertion into the fused features of a first person Speaker argument and a second person

Addressee argument, regardless of which argument is internal and which is external. The Addressee prefix is generally also preferred over the first person prefix to spell out the features of a single inclusive argument, whose feature geometry includes both a Speaker feature and an Addressee feature:[24]

(39) a. **g**-biin-igw-(i)naani "He brings **us** (IN)."
b. **g**-biin-aa-naani "**We** (IN) bring him."

The syntactic competition analysis correctly predicts that the inclusive argument will trigger agreement in (39), since it has an [addressee] feature, but this analysis makes no predictions about the morphological form of the agreement (*g*- or *n*-). Nevertheless, the generalization is a robust one: I am aware of no Algonquian language where the inclusive is spelled out as first person *n*-, or where the prefix preferentially indexes a first person (exclusive) argument rather than a second person one in transitive clauses. The generalization follows if both facts are derived by ranking the Addressee vocabulary item *g*- over a more general Participant item *n*-.

Béjar proposes that the inclusive argument lacks a [speaker] feature, which accounts for its realization via the Addressee prefix *g*-. However, this proposal cannot be correct in all cases, since in many languages the inclusive triggers plural Speaker agreement. Note the similarity in Ojibwa between the inclusive forms in (39) and the first person exclusive plural forms in (40a,b). A different agreement suffix is associated with second person (40c) and third person (40d) plurals.

(40) a. n-biin-igw-(i)**naani** "He brings **us** (EX)."
b. n-biin-aa-**naani** "**We** (EX) bring him."
c. g-biin-aa-**waa** "**You** (PL) bring him."
d. w-biin-aa-**waa**-an "**They** bring him (OBV)."

Thus, it appears that inclusive arguments have both a [speaker] feature and an [addressee] feature. The choice of the Addressee item *g*- over *n*- is determined purely by the ranking of vocabulary items.

Plural marking also figures in a second generalization that the vocabulary competition analyis captures more successfully than the syntactic competition analysis. In general, the class of arguments that is eligible for indexing by the prefix is identical to the class of arguments that is eligible for indexing by a certain number-marking suffix. In many Algonquian languages, both positions can register agreement with first person, second person, and inclusive

[24] Déchaine (1999) notes that Blackfoot has a special inclusive prefix in the independent order.

arguments, as well as with third person proximates (in clauses with an obviative argument). However, there are exceptions that strikingly illustrate the prefix/suffix correspondence. The examples below show Menominee nominal inflection (data from Bloomfield 1962). When the possessed noun is proximate, its number alternations are indicated by a final suffix, which registers obviation as well (41a–c). On the other hand, a third person proximate possessor is indexed by the personal prefix (41d,e), and its number alternations are indicated on a separate node, preceding the obviative suffix.

(41)	a.	ne-pɛːsekokasyam	"my horse (PROX)"
	b.	ne-pɛːsekokasyam-**ak**	"my horse**s** (PROX)"
	c.	ne-pɛːsekokasyam-**an**	"my horse(s) (**OBV**)"
	d.	**o**-pɛːsekokasyam-an	**"his (PROX)** horse(s) (OBV)"
	e.	**o**-pɛːsekokasyam-**owaw**-an	**"their (PROX)** horse(s) (OBV)"

The same affixes are used for verbal inflection. In the independent order, third person arguments are not indexed by the person prefix, and their number alternations are indicated by the final suffix (42a,b). However, third person arguments are indexed by the person prefix in the negative order, where their number alternations are indicated by the medial suffix (42c,d). Note that this position also registers Participant number alternations—even using exactly the same suffix, in the case of second person plurals (42e,f).[25]

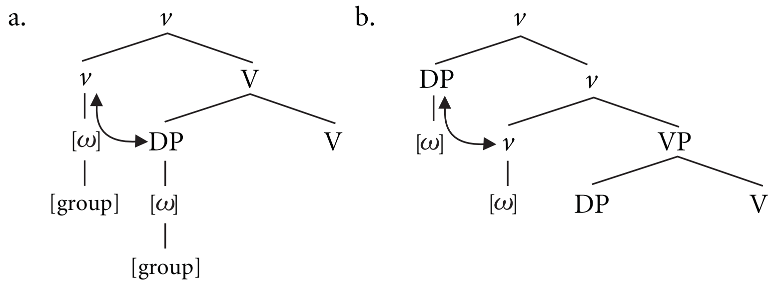
(42)	a.	naːnɛːw	"He (PROX) fetches him/them (OBV)."
	b.	naːnɛːw-**ak**	"**They (PROX)** fetch him/them (OBV)."
	c.	kan **o**-nɛːwaːn-an	"**He (PROX)** does not see him/them (OBV)."
	d.	kan **o**-nɛːwaːn-**owaw**-an	"**They (PROX)** do not see him/them (OBV)."
	e.	kan **ke**-nɛːwaːn-an	"**You (SG)** do not see him."
	f.	kan **ke**-nɛːwaːn-**owaw**-an	"**You (PL)** do not see him/them."

For Halle and Marantz, the correspondence between the prefix and medial suffix positions arises because there is an agreement relation between the fused pronominal clitic and a node that agrees with the person and number features of both arguments. A syntactic competition analysis predicts no such correspondence: person and number agreement have different feature specifications, so there is no reason why they should track the same arguments.

[25] All third person arguments are indexed by the prefix and medial plural suffix in the Menominee negative order, so (42f) can also mean "You (SG) do not see them". Plural agreement for third person possessors is presumably also in the same position as for Participant possessors, but Bloomfield (1962) does not give the relevant examples.

There are also straightforward empirical difficulties with the syntactic competition analysis of number agreement. Béjar proposes that number agreement in Algonquian reflects an Agree relation with an uninterpretable number feature on *v*, specified as [*ω* [group]]. This approach predicts that if the object is plural, the number suffix will reflect its features (43a); otherwise, it will reflect those of the external argument (43b).

(43)



The results below illustrate the predictions. If the object is plural, *v* agrees with it (44a). If not, *v* agrees with the external argument (44b). (44c) is consistent with the claim that *v* agrees with the external argument—though it is also consistent with the claim that *v* agrees with the internal argument, or that it fails to agree.

(44) a. g-biin-ini-**mw** "I bring **you** (PL)."
b. g-biin-i-**mw** "**You** (PL) bring me."
c. g-biin-i "**You** (SG) bring me."

However, the predictions of the syntactic competition analysis are not borne out if both arguments are plural. Under this analysis, the number suffix is predicted to agree with object. This prediction is correct in (45a), but not in (45b), which can only mean "I bring you (PL)".

(45) a. g-biin-i-**min** "You (SG/PL) bring **us** (EX)."
b. g-biin-ini-**mw** *"We (EX) bring **you** (PL)."

Béjar focuses on the Nishnaabemwin dialect of Ojibwa, which systematically lacks ordinary forms with a first person plural subject and a second person object. Instead, indefinite-subject *-igw* forms are used (46a,b).[26] As with other indefinite-subject forms (46c,d), these show number agreement with the logical object:

[26] The use of indefinite forms with a first person plural meaning is also seen in other languages, for example in French *on* "one" for *nous* "we".

(46) a. g-biin-igw-i "We bring you (SG)/You (SG) are brought."
b. g-biin-igw-i-**mw** "We bring **you** (**PL**)/**You** (**PL**) are brought."
c. g-biin-igw-i-**min** "**We** (**IN**) are brought."
d. n-biin-igw-i-**min** "**We** (**EX**) are brought."

Thus, this dialect does not provide strong evidence against the syntactic competition analysis.

However, most Algonquian languages have ordinary forms with a first person plural subject and a second person object. In the eastern dialects of Ojibwa, the plural suffix prefers to agree with a first person plural argument, regardless of whether it is an object (47a) or a subject (47b). The facts do not correspond to the predictions of the syntactic competition account, by which a plural object should always trigger agreement.

(47) a. g-biin-i-**min** "You (SG/PL) bring **us** (**EX**)."
b. g-biin-ini-**min** "**We** (**EX**) bring you (SG/PL)."
c. g-biin-ini-**mw** *"We (EX) bring **you** (**PL**)."

The same is true in Passamaquoddy, Plains Cree, and Potawatomi. A different pattern of number agreement arises in Swampy Cree, as seen in (33) above. However, this pattern is also incompatible with the predictions of syntactic competition. The number agreement suffix again shows no preference for an internal argument: instead, it preferentially reflects the features of a second person plural argument, whether it is an object (48a) or a subject (48b).

(48) a. ki-waapam-iti-**naawaaw** "I/we see **you** (**PL**)."
b. ki-waapam-i-**naawaaw** "**You** (**PL**) see me/us (EX)."

Evidently, fusion and vocabulary competition gives a better account of Algonquian person and number agreement than syntactic competition does.

6.5 Conclusion

I have argued for a distinction between *position-based* dependent agreement, as seen in Georgian personal prefixes, and *feature-based* dependent agreement, as seen in Algonquian person and number agreement. Position-based dependent agreement arises from syntactic competition to agree with a single set of uninterpretable features. The Agree operation targets the closest appropriate argument, giving rise to positional preferences. Feature-based dependent agreement arises from morphological competition. This competition ranks vocabulary items according to their morphosyntactic feature specifications, giving rise to feature-based preferences. If the features of two arguments occupy the same node, vocabulary competition alone will determine which argument's features will be realized. It was argued above that, unlike the morphological competition analysis, the syntactic competition analysis captures the generalization that the highest argument below *v* preferentially triggers agreement on the Georgian personal prefix, and makes intriguing new predictions about the syntactic structure of subject-Experiencer and perfect clauses. On the other hand, the morphological competition analysis correctly captures the absence of position-based preferences in Algonquian person and number agreement, as well as other properties of this agreement, such as the fact that second person and inclusive trigger the same prefix, while (exclusive) first person and inclusive can trigger the same plural suffix. This analysis also captures the correlation between the classes of arguments that trigger agreement in two separate positions. It appears, then, that dependent agreement is not a unitary phenomenon: like other forms of agreement, it arises from a systematic interaction of syntactic and morphological processes.

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7

Discontinuous Agreement and the Syntax–Morphology Interface

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7.1 Introduction

Discontinuous agreement, that is, agreement with a single argument by distinct parts of the verb, is a genetically and geographically diverse phenomenon:[1]

(1) a. **v**-c'er- **t**
1-write-PL
"We write" (Georgian; Hewitt 1995: 200)

b. **yi**-zrq- **uu**
3- throw-PL
"They all will throw" (Hebrew; Halle 1997: 432)

c. ma- **rna**-n-**panya**
AUX-1EX-2- PL
"We [verb] you" (Walmatjari; Hudson 1978: 74)

d. ta- **pu**-nan-tpul-c- **ak**
NEG-3- 2PL-hit- PF-SG
"You all didn't hit him" (Yimas; Foley 1991: 256)

e. Suek Bostonea **s**-ixus-**e**- n
you.PL to Boston 2-go- PL-PST
"You all are going to Boston" (Basque; Arregi 1999: 249)

f. ñoqa-yku-ta qam maylla-**wa**-rqa- nki-**ku**
1- 1PL-ACC you wash- 1O-PAST-2S- PL
"You washed us" (Cuzco Quechua; van de Kerke 1996: 124)

[1] Except where noted below, the distinction between clitics and agreement is irrelevant; the latter is used as a cover term for both. Agreement is said to be discontinuous if it has multiple discrete exponents. These, however, may be linearly adjacent. Consequently, "discontinuous" should not be confused with "discontiguous".

Interestingly, in every sentence in (1), the left boldfaced morpheme gives the person of the agreeing argument and the right, number only.

That discontinuous agreement obeys a "person left, number right" generalization is not a new observation (Trommer 2002 and references therein).[2] However, what has not been previously noted is that, when two arguments simultaneously trigger discontinuous agreement, they flank: **person**-*person*-*number*-**number**.

(2) a. ta- **pu**-*nan*-ŋa- r- *ŋkan*-**um**
NEG-3- 2PL- give-PF-PC- PL
"You few didn't give (it) to them" (Yimas; Foley 1991: 260)

b. nyurra-warnti ma- **rna**-*n*-*ta*- **lu** nyany-a nganampa-rlu
you- PL(.NOM) AUX-1- 2-SG-PL see- PST we- ERG
"We all [exclusive] saw you" (Walmatjari; Hudson 1978: 60)

This study concerns three questions that such strings raise.

(3) a. Why is agreement sometimes discontinuous?
b. Why, when agreement is discontinuous, is person left, number right?
c. Why do double discontinuities flank?

I argue that the answers must acknowledge a division of labor between the syntactic and postsyntactic (morphological) modules of the linguistic computational system. As such, I depart both from purely morphological (Noyer 1992, Halle 1997) and purely syntactic (Shlonsky 1989, Banksira 2000, Benmamoun 2000, Julien 2002, Nevins 2002, Tourabi 2002) accounts of the phenomenon; furthermore, flanking forces one to depart also from Trommer's (2002) analysis, which, like that proposed here, is morphosyntactic.

The answers given to (3) build on previous work and, so, are, to a large extent, independently motivable. As a general framework, I adopt Distributed Morphology (Halle and Marantz 1993, 1994), according to which phonological content (*vocabulary items*) is introduced (*vocabularization*) to syntactic structures only once syntactic computation has ceased. However, I refine Distributed Morphology in two ways.

[2] If a language has independent person and number probes, with the latter above the former, then the opposite order, number–person, can result. Such cases are systematically different from those considered here in that they permit dissociation; that is, their syntactic independence permits them to Agree with different arguments. See Béjar (this volume) on such cases. The terminology "discontinuous" applies only to the cases in this paper; Béjar's are termed "partial".

First, I assume that φ-features have internal structure. However, I reject the notion of an extra-syntactic feature geometry (Harley and Ritter 2002 and references therein), and, for reasons made clear below, propose, instead, the syntactic structure:

(4)
$$\begin{array}{c} \varphi \\ | \\ \pi \\ | \\ \omega \end{array}$$

Here, φ is just a category label, used for expositional clarity (so that it is obvious where in the structure the φ-features are). The real syntactic positions are $\boldsymbol{\pi}$ (*person*) and $\boldsymbol{\omega}$ (*number*).

Second, I assume that vocabularization occurs cyclicly, root out (Bobaljik 2000, Adger et al. 2003); that is, if X and Y are syntactic entities such that Y dominates X, phonological content is inserted into X before it is inserted into Y.

One of the main purposes of the postsyntactic modules is to transform the hierarchical relations that syntax constructs and semantics interprets into the adjacency relations of the linear objects that our articulators pronounce. Key to answering (3) is the claim that the φ-structure and the syntax constrain linear order. Syntax orders whole φ-sets with respect to other syntactic material. When the φ-set is vocabularized by a single phonological string, X, then the syntactic structure [φ [Y]] is linearized straightforwardly as [X→Y]. Notationally, this is represented by the removal of the brackets separating Y from X and insertion of an arrow between them. (The arrow is borrowed from Raimy's (2000) important formalization of linear precedence and adjacency.)

However, in cases of multiple sub-φ exponence, that is, when subparts of (4) are vocabularized independently, by X and Z, say, the result—

(5)
$$\begin{array}{l} X\rightarrow Y \\ | \\ Z \end{array}$$

—is not a pure (left-to-right) linear string. As argued below, discontinuous agreement responds to the need to linearize such structures whilst preserving ordering and adjacency relations imposed by the syntax and the φ-structure.

So, the answers proposed to (3) are:

(6) a. Agreement is discontinuous when there is multiple sub-φ exponence.
b. The order person-left number-right arises from the internal syntax of the φ-set.
c. Cyclic root-out vocabularization forces flanking.

The initial part of the chapter, Section 7.2, explains the proposal in more depth, discusses some past proposals, and motivates the somewhat novel φ-structure. Sections 7.3 and 7.4 examine the flanking languages Yimas and Walmatjari in detail, comparing the current proposal with purely syntactic alternatives, and showing them to be problematic. (There is no deep reason why Yimas and Walmatjari are the foci below; other languages would have served equally well, though double discontinuities, and, hence, flanking, are not abundantly common. The two provide more versus less straightforward applications of the current proposal.)

7.2 Proposal

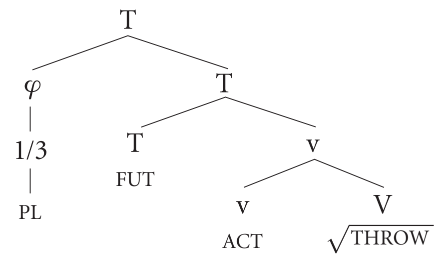
This section illustrates more fully the account sketched above (7.2.1) and compares it with past morphological, syntactic, and morphosyntactic proposals (7.2.2). Section 7.2.3 explains the somewhat novel view of feature organization.

7.2.1 *Proposal in action*

The account of discontinuous agreement phenomena offered here is modular: syntax deals in whole φ-structures and determines their position with respect to other syntactic material; postsyntactically, vocabularization may deal in sub-φ-structures and determines the positions of different pieces of inflection with respect to other phonological material. So, the descriptive terms "discontinuous" and "partial" agreement correspond to different syntactic realities: sub-φ-structures are independently active in the syntax of languages with partial agreement, but not in those with discontinuous agreement.

To illustrate, consider first a single instance of discontinuous agreement. We will consider two forms, the discontinuous (1b) and the simplex *ni-zroq* "we will throw" (1PL-throw). In both cases, the verb raises to T (Shlonsky 1989 for the modern language, Harbour 2007b for the classical), so that the output of syntax is the complex head:

(7)



Vocabularization proceeds root out, beginning, in the current case, at the verb root, V, and reaching φ–1/3–PL last. Leaving aside the complexities of Hebrew verb morphology, let us note that the φ's sister is realized as *zroq*. So, we have the structure:

(8) [φ [**zroq**]]
|
1/3
|
PL

Consider, now, first, the first person plural. When φ is targeted for vocabularization, the syntactic sisterhood relation is immediately transformed into one of linear adjacency.

(9) [φ→**zroq**]
|
1
|
PL

The φ-set, φ–1–PL, has a single exponent, /ni/. Its insertion into (9) results in *ni-zroq*, which is clearly a perfect linear string.

Matters are not so straightforward with the third person plural, however. Again, sisterhood is immediately transformed into linear adjacency, into which two vocabulary items, [φ–3] ⇔ /yi/ and [PL] ⇔ /uu/, are inserted:

[φ→**zroq**] ⇒ [**yi**→**zroq**]
| |
3 **uu**
|
PL

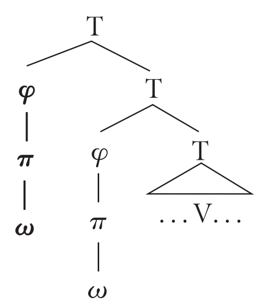
The result of vocabularization is, this time, not a linear, but a frayed, string.

Nonetheless, (9) can be satisfactorily linearized. Since *yi* dominates *uu* hierarchically, it must precede it linearly (cf. the Linear Correspondence Axiom; Kayne 1994). So, this rules out the order *uu-yi-zroq* (number-person-verb). Nor can *uu* intervene between *yi-zroq* without disrupting their linear adjacency. However, the order *yi-zroq-uu* respects both the dominance/linear precedence of *yi* over *uu* and the previously established adjacency. Regular phonology yields the surface form, *yi-zrq-uu*.

The foregoing derives a number of facts. First, discontiguous agreement arises when multiple sub-φ exponence creates a frayed string. Discontiguities permit linearization of bifurcating structures in a manner compatible with the φ-internal dominance relations and adjacency relations previously established by the postsyntactic component. Consequently, it is the internal structure of the φ-set that gives the order person-left number-right. These are the answers to questions (3a) and (3b). The latter naturally raises the subsidiary question of why the features should be so organized, on which, see Section 7.2.3.[3] We turn now to answering (3c).

The reasons for flanking follow from the devices already called on above. Consider an abstract case:

(10)



Since vocabularization proceeds cyclically root-out, it will start at V and finish at the higher φ-set. Momentarily disregarding the latter, the structure to be linearized is identical to the Hebrew tree (7). Consequently, vocabularization and linearization of the higher φ's sister yield:

[3] The former answer raises the question of what mechanisms the postsyntactic component employs to move vocabulary items about. One might simply state that this movement is an automatic response. However, Halle and Harris (2005) extend a phonological treatment of reduplication and metathesis to cover the unexpected positions of plural inflections attested in a variety of Spanish dialects. Given that theirs is also a number-right phenomenon, their framework might be fruitfully applied here; however, this lies beyond the scope of the current work.

$$[\boldsymbol{\varphi}\ [\pi \rightarrow \mathrm{V} \rightarrow \omega]]$$
$$|$$
$$\boldsymbol{\pi}$$
$$|$$
$$\boldsymbol{\omega}$$

Structurally identical to (8), this yields $\boldsymbol{\pi} \rightarrow \pi \rightarrow \mathrm{V} \rightarrow \omega \rightarrow \boldsymbol{\omega}$. So, flanking follows from the cyclic application of the linearization procedure already established. We see real versions of this abstract case in the discussion of Yimas.

Having laid out my own proposal, I turn to past accounts, to explain why I think a new one is necessary.

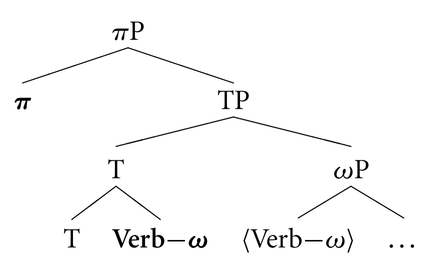
7.2.2 *Past accounts*

Three types of account have been offered for discontinuous agreement phenomena: the purely morphological, the purely syntactic, and hybrid accounts. I give a very brief overview of these here, noting points of contact and divergence.

Noyer (1992) and Halle (1997) offer morphological accounts of discontinuous agreement in Semitic. They posit a process, Fission, that creates two loci for vocabulary items out of a single syntactic terminal node. A shortcoming of their account is that they stipulate, vocabulary item by vocabulary item, which are prefixes and which, suffixes. As the stipulation could equally easily be the reverse, Fission cannot account for the crosslinguistic pattern illustrated in (1) and throughout Semitic as a whole (see Noyer's chapter 1).

Syntactic analyses have been suggested or pursued by several researchers (Shlonsky 1989, Banksira 2000, Benmamoun 2000, Julien 2002, Nevins 2002, Tourabi 2002). The core idea, pursued most straightforwardly by Nevins, building on Shlonsky's work, is that the verb moves between person and number, which project separately along the main functional spine of the tree:

(11)



There are three problems with this proposal. First, Harbour (2007b) shows that this is untenable, on syntactic grounds, for Classical Hebrew, one of the languages that is supposed to motivate such an analysis. Second, facts about impure person-number discontinuities (7.2.3.1) cannot be accommodated in a phrase structure with pure person and number projections. Third, we will see in the treatments of Yimas and Walmatjari that such analyses are unable to cope with the full variety of morpheme orders (no versus one versus two discontinuities) that these languages display (7.3.3 and 7.4.3).

Nonetheless, the current proposal shares features with each of the above. On the one hand, it can be read as supplementing the Fission view with two further principles: one linearization-related, to explain when Fission occurs, and the other structural, to explain Fission's concomitant person-left number-right order. On the other hand, it shares with the syntactic approach the idea that robust ordering phenomena must be syntactic at root; however, rather than lay the relevant heads out along the function spine of the tree, it organizes them in a subtree.

Architecturally speaking, this account is most similar to Trommer's (2002), which attributes the bulk of the ordering to the syntax, but the establishment of discontinuities to the postsyntactic component. Besides issues of implementation (Trommer appeals to a modular version of Optimality Theory), there are two main differences between our accounts.

First, Trommer simply has constraints that align person agreement to the left and number to the right; absence of the reverse pattern, or opposite constraints, is not explained. By contrast, I have tried to derive the ordering on structural grounds, pertaining, at root, to the syntax–semantics interface. However, my account of the linearization of frayed strings can clearly be recast in Optimality-Theoretic terms.

Second, Trommer does not predict the flanking property of double discontinuities. The reason is that his constraints command alignment of person left and number right. When multiple persons/numbers are to be left/right aligned, no principle decides between the equally ranked $\boldsymbol{\pi}$-π-ω-$\boldsymbol{\omega}$, $\boldsymbol{\pi}$-π-$\boldsymbol{\omega}$-ω, π-$\boldsymbol{\pi}$-$\boldsymbol{\omega}$-ω, π-$\boldsymbol{\pi}$-ω-$\boldsymbol{\omega}$. Trommer recognizes that person and number are not always at the edge of words, as constraints for left/right alignment would normally entail. So, he permits person/number morphemes to be anchored to other morphemes that are not at the word edge. For this to work, the anchoring morpheme, the person/number morpheme, and the word-edge morpheme must all be ordered at once. Consequently, cyclic vocabularization cannot be relied on to derive flanking. I believe, however, that abandonment of anchoring in favor of cyclic insertion would produce the same results, though I omit details here.

In sum, then, despite similarities to previous accounts, the present proposal constitutes a departure from them in the precise division of labor it supposes, in the mechanisms it relies on, and in the data that constitute its support.

7.2.3 *Feature organization*

The current proposal differs from past work also with respect to feature organization, eschewing, in particular, the notion of a feature geometry as distinct from purely syntactic structure. This section describes the nature of these differences and the reasons behind them. Sections 7.2.3.1–2 examine two novel areas of data, impure discontinuities and the structure of pronouns in head-final languages, in light of the φ-structure proposed.

Feature geometries are a formal means to capture implicational relations between features or feature sets, such as:

(12) DUAL → SINGULAR Some languages distinguish singular from dual from other; and others distinguish only singular from other; however, none distinguishes only dual from other. (Corbett 2000)

(13) PERSON → NUMBER/GENDER Some verb forms agree for person, number, and gender (Romance and Hebrew finite verbs, Slavic non-past); and others agree for number and gender without person (Romance and Hebrew participles, Slavic past tenses); however, none agrees for person without number and gender. (Shlonsky 1989)

Feature geometries represent implications as (14), read as 'For a language to activate the dual∼non-dual distinction, it must first activate singular∼non-singular distinction'; hence, no dual without singular.

(14) singular
|
dual

Such notation is syntactic in appearance, particularly where structures branch, but no claim is made as to where geometric implications are stored: they might be derived from syntax or semantics, or they could constitute UG morphology.

In my opinion, feature geometries are not explanations, but generalizations in search of an explanation, and not all geometric relationships are to be explained alike. For instance, intracategorial relationships, as between different numbers, are purely semantic (Harbour 2006a,b). (12), for instance, derives from dual's being composed of two underlying features, [−singular −augmented]. Languages may choose to have just a one-feature number distinction, as do English [±singular] and Ilocano [±augmented]. However, dual demands activation of two features, which immediately gives the language a three-way distinction, singular [+singular −augmented], dual [−singular −augmented], and plural [−singular +augmented].[4] This derives the impossibility of having only a dual∼non-dual distinction. Geometry is otiose.

Other implicational relations, intercategorial ones like (13), are syntactic. For instance, consider the ungrammaticality that results if C projects directly above *v*P (15b), rather than TP (15a).

(15) a. I want [$_{\mathrm{CP}}$ for [$_{\mathrm{TP}}$ John to [$_{v\mathrm{P}}$ go home]]]
b. *I want [$_{\mathrm{CP}}$ for [$_{v\mathrm{P}}$ John go home]]

The reason for the ungrammaticality cannot be Case, which *John* receives under adjacency from *for*. Rather, it is the absence of *to* and, so, of TP. Under normal circumstances (i.e., sluicing, etc. aside), the functional hierarchy C–T–*v* cannot be generated truncated, as C–*v*.

I suggest that the person–number relationship (13) be viewed in this way. Just as one cannot normally have C without T, one cannot have person without number; and, so, just as C dominates T, person must dominate number. Hence (ignoring gender, which is irrelevant here):

(16)
$$\begin{array}{c} \varphi \\ | \\ \pi \\ | \\ \omega \end{array}$$

(φ, here, is merely a category-like label, not an actual part of the structure.)[5]

One compelling reason to view φ-structures as syntactic is their interaction with other syntactic processes. For instance, the verb forms in Romance (Pollock 1989), Modern Hebrew (Shlonsky 1989) and Classical Hebrew (Harbour 2007b) that have person agreement raise higher than those, such as participles, that do not. That is, the difference between φ–π–ω and φ–ω correlates with difference in height of verb movement.

[4] The fourth possibility, [+singular +augmented], is contradictory (Harbour 2007a).

[5] Just as it is possible for T to project without C, so it is possible for number to project without person; this generates the smaller structure (i), which is, nonetheless, a proper φ-set (Adger and Harbour 2007).

(i)
$$\begin{array}{c} \varphi \\ | \\ \omega \end{array}$$

The syntactic structure also lends itself to explanation of a number of other facts, including impure person–number discontinuities and the structure of pronouns in head-final languages.

Before proceeding to these, though, I suggest that person dominates number, and not vice versa, on semantic grounds—until now, both in this paper and in syntactic work on agreement discontinuities, the dominance relation has merely been stipulated. Note, first, that person is semantically more abstract than number: number concerns only operations over lattices (Link 1983; Harbour 2006a,b for morphological applications), whereas person is presuppositional and concerns the assignment of variables to individuals (e.g., Heim, this volume). Second, note the general tendency for semantic abstractness to increase as one moves up the tree. To paint a crude picture: events and entities at the root node, then heads that introduce relations to that event or entity, such as cause or possessor, then the introduction of world variables and generalized quantifiers, and so on, up to general propositional and discourse-related operators. If this tendency represents the reality of the syntax–semantics interface, then the hierarchy φ–π–ω follows from person's greater abstractness.

7.2.3.1 *Impure person–number discontinuities* Hebrew lends itself to the view that person and number are autonomous because, when discontinuous, they are pure: in *yi-zrq-uu*, *yi* realizes person without number and *uu*, number without person. Not all discontinuities are so. Languages with impure discontinuities—Yimas, Gahuku, Cuzco Quechua—argue in favor of the pared-down structure above, and against more articulated decompositions.

To illustrate an impure discontinuity, consider (2a), repeated below: the second person paucal, though discontinuous, is not realized by a pure person prefix and a pure number suffix. Rather, the prefix is a π/ω-amalgam, second plural, and the suffix represents only the paucal. ((17b) illustrates second plural itself.)

(17) a. ta- pu-**nan**-ŋa- r- ŋ**kan**-um
NEG-3- 2PL-give-PF-PC- PL
"You few didn't give (it) to them" (Yimas; Foley 1991: 260)

b. pu- **nan**-tu- t
3PL-2PL- kill-PF
"You all killed them" (Yimas; Foley 1986: 132)

Given the feature inventory proposed by Harbour (2006a,b), plural, in Yimas, is [−singular +augmented +additive] and paucal is [−singular +augmented −additive]. So, vocabulary items like (18a) will yield the correct form (in particular, there is no mystery of how something can be plural and paucal at once). (I abstract away from the feature content of person labels like '2'. See Trommer, this volume.)

(18) a. [2 −singular + augmented] ⇔ /nan/
[−additive] ⇔ /ŋkan/ in the context of [+augmented]

b.

$$\begin{array}{c} \varphi \\ | \\ 2 \\ | \\ -\text{singular} \\ +\text{augmented} \\ -\text{additive} \end{array} \Rightarrow \begin{array}{c} \textbf{nan} \\ | \\ \textbf{ŋkan} \end{array} \Rightarrow \textbf{nan} \ldots \textbf{ŋkan}$$

(Note that Fission alone fails to derive the order of the two morphemes.)

Another Papuan language, Gahuku, also shows impure discontinuities. Foley (1986: 133, citing data from Deibler 1976) explains that singular and plural actors are indicated by fused person–number morphemes, like *a*- 3PL. In the third person dual, two morphemes are found, one for the π/ω-amalgam third plural, and another for the dual.

(19) a. ni- v- **a**- ve
PROG-go-3PL-PL.DECL
"They are going" (Gahuku; Deibler 1976)

b. ni- v- **a**- **si**- ve
PROG-go-3PL-DL-PL.DECL
"They two are going" (Gahuku; Deibler 1976)

Taking plural to be [−singular +augmented] and dual [−singular −augmented] (Harbour 2006b and references therein), we can again accommodate the overlap (20a).

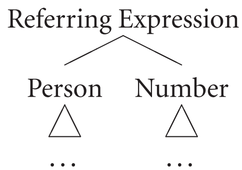
(20) a. [3 −singular] ⇔ /a/
[−augmented] ⇔ /si/ in the context of [−singular]

b.

$$\begin{array}{c} \varphi \\ | \\ 3 \\ | \\ -\text{singular} \\ -\text{augment} \end{array} \Rightarrow \begin{array}{c} \textbf{a} \\ | \\ \textbf{si} \end{array} \Rightarrow \textbf{a} \ldots \textbf{si}$$

Languages such as Yimas and Gahuku, which only partially separate number from person, are not accommodable in phrase structures that wholly separate the two, if π/ω discontinuities are to result from V's landing between the two feature sets.[6] This likewise detracts from the appeal of φ-geometries, such as Harley and Ritter's, that apportion person and number to separate substructures:

(21)



Finally, Cuzco Quechua presents a different impure discontinuity: pure π plus a π/ω-amalgam, as opposed to Yimas's and Gahuku's π/ω-amalgam plus pure ω—see the first word of (1f). Its treatment is analogous to those above.

7.2.3.2 *Pronouns* The φ-structure (4) may look syntactically odd, as it lacks specifiers and a lexical root; it is merely a function spine. However, in lacking these, neither the headedness parameter nor root raising (on a par with N-raising or V-raising) can apply. That is, there is nothing to disturb the basic order $\pi \rightarrow \omega$.

This predicts an interesting fact, hitherto unnoted, I believe: that, even in robustly head-final languages, such as Walmatjari (Table 7.1) or Comanche (Table 7.2),[7] pronouns have the structure **person***number*. This is so: italic endings are confined to single columns, the bold beginnings to single rows. (Typographically unmarked forms are fused.)

Table 7.1 Composition of Walmatjari Pronouns

	Singular	Dual	Plural
1in	—	**ngali***jarra*	**ngali***mpa*
1ex	**nga***ju~ji*	**nga***jarra*	**nga***nimpa~nampa*
2	nyuntu	**nyurra***jarra*	**nyurra***warnti*
3	**nyantu**	**nyantu***jarra*	**nyantu***warnti*

Source: Hudson 1978: 85.

[6] One could respond to this by laying out the individual number features in the syntax: so that, in Yimas, say, the verb moves to between π > [±singular] > [±augmented] and [±additive]. I do not pursue this avenue here, as it does not solve other problems of syntactic accounts. See Sections 7.3.3 and 7.4.3.

[7] The pronouns of more familiar head-final languages—Japanese, Turkish, Kiowa—are unenlightening here.

TABLE 7.2 Composition of Comanche Object Pronouns

	Singular	Dual	Plural
1IN	—	**ta***hi*	**ta**(*mm*)*i*
1EX	**nɨ**(*e*(*ti*))	**nɨ***hi*	**nɨ***mmi*
2	**ɨ**(*mmi*/*ɨ*)	**mɨ***hi*	**mɨ**(*mm*)*i*
REFL	**pɨ**(*mmi*)	**pɨ***hi*	**pɨ**(*mm*)*i*
3NEAR	**i**	**i***tɨhi*	**i***tii*
3IMPSN	**ma**	**ma***tɨhi*	**ma***tii*
3MID	**o**	**o***tɨhi*	**o***tii*
3FAR	**u**	**u***tɨhi*	**u***tii*

Source: Charney 1993: 98.

7.2.4 *Summary*

This section has presented and illustrated the proposal, has highlighted similarities and differences to earlier work, and has motivated a somewhat novel φ-structure on somewhat novel data—impure discontinuities and pronoun composition in head-final languages. With this in place, we now turn to two case studies, Yimas and Walmatjari. The structure of both sections is the same: an initial overview of the facts is given, the flanking cases are analyzed, and the analysis is compared with a syntactic analysis, to which it is argued to be superior.

7.3 Yimas

Yimas (Foley 1991; Foley 1986 for comparative discussion) is a non-Austronesian language of New Guinea, spoken in the Sepik River valley. It has three persons and four numbers (singular, dual, paucal, plural) and person conditions an ergative split. The language exhibits several characteristics of non-configurational, polysynthetic languages (see especially Phillips' syntactically revealing series of papers, 1993, 1994a–c).

Yimas displays double discontinuities and flanking in a very straightforward fashion: given the basic order of argumental agreement (Section 7.3.1) and the theoretical mechanisms given above, the ordering facts follow (Section 7.3.2). This is compared with a syntactic analysis in Section 7.3.3. An important point to be borne in mind below is that the syntactic mechanisms that would be required for a purely syntactic account of Yimas are significantly different from those required for Walmatjari (7.4.3), a difference that stands in contrast to the similarity of the morphosyntactic accounts offered for both languages.

7.3.1 *Overview of the verb*

The verb is a highly complex area of Yimas grammar: presence and ordering agreement affixes on the verb are determined by the interaction of arguments' φ-features and thematic roles with whether the clause is modal, negated, subordinated or questioned.[8] Given such complexity, it is to be expected that I limit myself to details relevant here; readers worried that my narrow focus represents an unnatural gerrymandering of Yimas grammar are referred to the sources cited above. The facts relevant below concern ordering of agreement affixes and agreement discontinuities for local paucals and for verb-initial affixes under negation.

Order is important in two respects below. First, the prefix order predicts suffix order. Second, it proves difficult for purely syntactic accounts to explain both order and flanking. Order is determined in the first instance by person (local person is directly preverbal) and secondarily by Murasugi's (1992) generalization, that ergative agreement is innermost in ergative systems, nominative in nominative. As Yimas is ergative for third person only, this entails that third person agents and local objects are innermost. This principle comes into play either when no argument is local, or when two are.

I now list the details for completeness, but emphasize that what readers need to know has just been stated. If no argument is local, then the order for (di)transitives is O_3-A_3-V-(D_3). If only the agent is local, then the order is O_3-$A_{1/2}$-V-(D_3); if only the indirect object, O_3-A_3-$D_{1/2}$-V;[9] it is not permitted for the direct object of ditransitives to be local, an instance of the Person Case Constraint. For two local arguments, there are several subcases. If the agent is first person and the second person is singular, then a portmanteau morpheme is used, with the order O_3-A_1D_2-V for ditransitives, A_1O_2-V for transitives; for other first-person-agent-with-second-person combinations, the second person only agrees, with the order O_3-D_2-V for ditransitives, O_2-V for transitives; for all first person direct object combinations, the first person and the φ-simplest argument agree, in the order O_3-D_1-V for ditransitives, A_2-O_1-V

[8] The term "agreement affix" is used descriptively. I leave open the possibility that they are, in fact, the arguments themselves. See Foley (1991: 227–35) and Phillips (1993).

[9] Foley claims that 3sgA does not conform to this, but patterns with 2sg/dl/pc/plA. However, if we analyze 3sgA as having zero realization here, the syntactically odd grouping {3sg, 2sg, 2dl, 2pc, 2pl} is avoided. The analysis is reasonable as [3sgA] $\Leftrightarrow$ /Ø/ occurs as an option in the transitive system:

(i) **na**- nan- tay ~ Ø-nan-tay
3sgA-2sgO-see
"He saw you" (F202)

for transitives. (Note when two arguments are local, not all expected affixes occur for some person–number combinations.) For intransitives, agreement is prefixal, φ-V.

Discontinuities arise in two cases. The first concerns paucal marking of local arguments in (di)transitives. Some examples are given below:[10]

(22) a. pu- **kay**- cay-c- **ŋkt**
3PLO-1PLA-see-PF-PC
"We few saw them" (F220)

b. pu- **kra**- tay-c- ŋ**kt**
3PLA-1PLO-see-PF-PC
"They saw us few" (F220)

c. uraŋ k- ŋkl- **kra**- tkam-r- ŋ**kt**
coconut 3SGO-3PCA-1PLD-show-PF-PC
"They few showed us few showed the coconut" (F221)

d. uraŋ k- **kay**- tkam-r- **ŋkan**-akn
coconut 3SGO-1PLA-show-PF-PC- 3SG.DIR
"We few showed him the coconut" (F221)

The paucal for local arguments consists of a plural argument prefix and a paucal suffix (cf. 7.2.3.1). Though the prefix, naturally, varies according to person and argument role, the suffix does not; its form is determined only by word-finality, *-ŋkt* in (22c) but *-ŋkan-* in (22d). For third person, plural (22b) and paucal (22c) are distinct and no suffix occurs.

The second discontinuity, concerning third person and negation, must be presented in two parts. The simpler cases—negated third person intransitives—consist of *pu-*, a pure third person prefix, and an appropriate number suffix. (Here, because all numbers are suffixal, the paucal is suffixal too, and so *-ŋkt* does occur with third person; yet, still, it does not cooccur with a 3PL prefix.)

(23) ta- **pu**-wa-nan- **Ø/rm/**ŋ**kt/m**
NEG-3- go-NR.PST-SG/DL/PC/PL
"He / Those two / Those few / They didn't go yesterday" (F252)

The more complicated cases are transitives, where the same pattern arises—

(24) a. ta- **pu**-n- tpul-c- **ak**
NEG-3- 2/3SGA-hit- PF-SG
"You/he didn't hit him" (F256)

[10] 'F' numbers in these and subsequent examples refer to page numbers in Foley (1991).

b. ta- **pu**-nan- tpul-c- **um**
NEG-3- 2PLA-hit- PF-PL
"You all didn't hit them" (F256)

—but only if the following morpheme is *n*-initial.[11] Otherwise, third person is realized as zero and only the number suffix is heard.

(25) a. ta- **Ø**- mpu-tay-c- **ak**
NEG-3-3PLA-see-PF-SG
"They didn't see him" (F257)
b. ta- **Ø**-ŋa- tpul-c- **rm**
NEG-3-1SGO-hit- PF-DL
"They two didn't hit me" (F258)

When these two patterns cooccur, there is flanking.

(26) a. ta- **pu**-*nan*- ŋa- r- *ŋkan*-**um**
NEG-3- 2PLA-give-PF-PC- PL
"You few didn't give (it) to them" (F260)
b. ta- **Ø**-*kra*- tpul-c- *ŋkan*-**um**
NEG-3-1PLO-hit- PF-PC- PL
"They didn't hit us few" (F260)

7.3.2 *Analysis*

The analysis of Yimas involves straightforward application of Section 7.2.1. Syntax orders whole φ-sets, which are discontinuous, postsyntactically, if there is multiple sub-φ exponence. The discontinuity preserves adjacency and linear order, and so results in the lower vocabulary item, number, moving rightwards. Flanking derives from cyclic, root-out application of vocabularization. The syntactic principles that determine affix order are:[12]

(27) SYNTACTIC ORDERING PRINCIPLES FOR YIMAS
a. Local arguments as innermost prefix.

[11] Foley states the condition negatively, in terms of blocking, and morphosyntactically:

> it is not used when the following prefix is a pronominal prefix representing a first person participant, a second person dual participant, a second person plural O participant, or a third person non-singular A participant. It is hard to see how this grouping forms a natural class, but, nonetheless, these are the pronominal prefixes which prohibit a preceding *pu*- 3. (Foley 1991: 255)

The conditions are extensionally equivalent.

[12] Explaining these is beyond the scope of this work. The reader should consult Phillips' and Murasugi's work.

b. Murasugi's principle: ergative/nominative agreement is innermost in ergative/nominative systems.
c. Third person datives are suffixal.

I now demonstrate how the flanked form in (26a) derives from a basic structure determined by (27):

$$\begin{array}{llll}
[\textsc{neg}\ [& \varphi & [\varphi & [\mathrm{V}\ \ \textsc{asp}]]]] \\
 & | & | & \\
 & 3\mathrm{O} & 2\mathrm{A} & \\
 & | & | & \\
 & \textsc{pl} & \textsc{pc} &
\end{array}
\quad \equiv \quad
\begin{array}{ll}
[\textsc{neg}\ [\varphi & [\varphi\ [\mathrm{V}\ \textsc{asp}]]]] \\
\quad | & \quad | \\
\quad 3\mathrm{O} & \quad 2\mathrm{A} \\
\quad | & \quad | \\
-\text{singular} & -\text{singular} \\
+\text{augmented} & +\text{augmented} \\
+\text{additive} & -\text{additive}
\end{array}$$

Case information (A, D, O) is represented alongside person for clarity's sake. I make no claim as to the feature content or position of Case categories.

Vocabularization proceeds root out, targeting first the verb (*ŋa*), then aspect (*r*). Next, a linear adjacency relation is established between the inner φ-structure and the previously linearized material:

$$\begin{array}{ll}
[\textsc{neg}\ [\varphi & [\varphi \rightarrow \textbf{ŋa} \rightarrow \textbf{r}]]] \\
\quad | & \quad | \\
\quad 3\mathrm{O} & \quad 2\mathrm{A} \\
\quad | & \quad | \\
-\text{singular} & -\text{singular} \\
+\text{augmented} & +\text{augmented} \\
+\text{additive} & -\text{additive}
\end{array}$$

2pcA is realized by two vocabulary items, [2A −singular +augmented] ⇔ /nan/ and [−additive] ⇔ /ŋkan/, producing a frayed string, linearized as:

$$\begin{array}{lll}
[\textsc{neg}[& \varphi & [\textbf{nan} \rightarrow\ \textbf{ŋa} \rightarrow \textbf{r}]]] \\
 & | & \ | \\
 & 3\mathrm{O} & \textbf{ŋkan} \\
 & | & \\
\multicolumn{3}{l}{-\text{ singular}} \\
\multicolumn{3}{l}{+\text{ augmented}} \\
\multicolumn{3}{l}{+\text{ additive}}
\end{array}
\quad \Rightarrow \quad
\begin{array}{l}
[\textsc{neg}[\varphi\ [\textbf{nan} \rightarrow\ \textbf{ŋa} \rightarrow \textbf{r} \rightarrow\ \textbf{ŋkan}]]] \\
\qquad\quad | \\
\qquad\quad 3\mathrm{O} \\
\qquad\quad | \\
-\text{singular} \\
+\text{ augmented} \\
-\text{additive}
\end{array}$$

Next, a linear adjacency relation is established between the remaining φ-structure and the previously linearized material:

[NEG [φ→**nan**→**ŋa**→**r**→**ŋkan**]]
|
3O
|
−singular
+augmented
+additive

Again, two vocabulary items are inserted, [3] ⇔ /pu/ in the context of [NEG] and *n*, and [−singular +augmented +additive] ⇔ /um/, which also produce a frayed string, linearized as:

[NEG [**pu**→**nan**→**ŋa**→**r**→ŋ**kan**]] ⇒ [NEG [**pu**→**nan**→ŋ**a**→**r**→**ŋkan**→**um**]]
|
um

Finally, [NEG] ⇔ /ta/ gives the double flanked *tapunanŋarŋkanum* of (26a).

So, Yimas is easily accounted for.[13] How would a syntactic account fare?

7.3.3 *A syntactic account?*

The first syntactic account one might attempt is head movement. However, it is impossible to posit a single underlying order to derive all four combinations: (i) $\boldsymbol{\varphi}$-φ-V, (ii) $\boldsymbol{\pi}$-φ-V-$\boldsymbol{\omega}$, (iii) $\boldsymbol{\varphi}$-π-V-ω, (iv) $\boldsymbol{\pi}$-π-V-ω-$\boldsymbol{\omega}$. For discontinuities to be possible at all, person and number must project separately. So, for (i), the underlying order must be $\boldsymbol{\pi}$-$\boldsymbol{\omega}$-π-ω-V. A single application of head movement yields (iii). However, (ii) and (iv) are impossible: $\boldsymbol{\omega}$ cannot be postverbal unless π is, which never occurs. Like problems afflict all underlying orders.

As an alternative, consider Kiowa, where preverbal particles and their concomitant verbal suffixes flank:

(28) **Béthɔɔ** *an* ɔ́- bôu- hɔnx!ou- *yii*- t!ɔɔ-**dei**
unbeknownst HAB 3SG.DAT.REFL-always-come late-IMPF-FUT-EVID
"I didn't realize he was going to keep on coming late"
(Kiowa; Adger and Harbour 2007: 17)

[13] 1SG/DL/PC/PLA with 2PCO is mildly troublesome. Foley decomposes one such form as (i), to which I have added "A/O", to emphasize that, on his analysis, the prefix is ambiguous between the two. Note that *all* affixes reference 2PCO.

(i) paŋ- kul- cpul-c- ŋkt
2PCA/O-2PLO-hit- PF-PC
"I hit you few" (F222)

My account cannot accommodate the order of this triple exponence: if it arose, the second prefix would be the penultimate suffix ([*paŋ*-[*kul-ŋkt*]]-*cpul-c* ⇒ *paŋ-cpul-c*-[*kul-ŋkt*]). Therefore, I suggest reanalysis: *paŋ* is 2PCA only and *paŋkul*, monomorphemic, is 2PCO. (i) then involves merely an impure bipartite discontinuity.

As a working hypothesis, colleagues and I adopted Julien's (2002: ch. 4) approach to free-word-order, head-final languages, according to which complements always move to the specifiers of their selecting heads. If the particles here are non-selecting, but merely semantically dependent on the appropriate verbal suffixes (somewhat like adjuncts), then Julien's system neatly derives the flanking. Removing irrelevant heads, [Asp^0 VP] becomes [$_{\text{SpecAspP}}$ VP [Asp^0 ⟨VP⟩]], by complement-to-specifier movement. Next the particle is merged and then the evidential head: [Evid^0 [**an** [$_{\text{SpecAspP}}$ VP [**Asp^0** ⟨VP⟩]]]]. Again, the complement moves to the specifier, and then the final particle is merged:

[**béthɔɔ** [$_{\text{SpecEvidP}}$ [**an** [$_{\text{SpecAspP}}$ VP [**Asp^0** ⟨VP⟩]] [**Evid^0** ⟨AspP⟩]]]]

The desired flanking results. As Yimas flanking also involves verb movement, and as Yimas, like Kiowa, is head-final with free word order, a reasonable syntactic approach might parallel the above.

There are, however, impediments to the parallel. For it to work, we require motivation for the particle-likeness of the features realized as prefixes; without a principle, the account must stipulate prefixality affix by affix. Finding this motivation is tricky, as impure discontinuities (7.2.3.1) mean that there is no simple correlation like "person is particle-like/prefixal, number not". It is also doubtful that negation, which conditions some discontinuities, should have the syntactic effect of making heads of features that are otherwise particle-like. Without such principles, I am loath to apply here a mode of explanation, which plausibly applies elsewhere. I conclude, therefore, the morphosyntactic account (7.2.1) is to be preferred.

7.4 Walmatjari

For a less straightforward application of the current proposal, we turn to Walmatjari, which prima facie challenges it, as it shows quite a variety of person–number orders (see Table 7.3). However, the relationship between the syntax and the morphology is almost identical to that in Yimas. The unexpected orders result entirely from the application of language-specific phonological readjustments, the input to which must be the flanking structure that the current proposal provides. Thus, secunda facie, Walmatjari supports the analysis offered here.

Walmatjari (Hudson 1978) is spoken in the north of Western Australia and classified by Wurm (1972) as belonging to the Ngumbin Subgroup of the Pama-Nyungan Family. It is a suffixing language with free word order subject to one major restriction: second position is generally occupied by an auxiliary cluster. The agreement parts of this cluster, where flanking arises, are the focus

Table 7.3 Different Agreement Orderings in Walmatjari

Subject	Object	Ordering	Example
2pl	1ex.dl	ππωω	ma -**n**-tarra-nya-**lu** aux-2-1ex -dl -pl
2pl	1ex.pl	ππωω	ma -rna -**n**-panya-**lu** aux-1ex-2-pl -pl
2pl	1sg	φπω	pa -ja -**n**-**ta** aux-1sg-2-pl
2pl	3pl	πωφ	ma -**n**-**ta** -nya aux-2-pl-3pl

Source: Hudson 1978: 75.

below. Section 7.4.1 presents an overview of the auxiliary, distinguishing the agreement parts, important below, from the non-agreement parts. Section 7.4.2 turns to cases of flanking. It begins with the constituency and ordering of agreement in the auxiliary (7.4.2.1), distinguishing the cases that feed flanking from those that do not. Analysis of the flanking cases and deviations from it follow (7.4.2.2). Finally, the analysis is compared with a purely syntactic one (7.4.3).

7.4.1 *Overview of the auxiliary*

Hudson describes the auxiliary as comprising a root plus seven-place template.[14]

(29)	Root	Dubitative	Person/Number	Dat.	Accessory/Refl./Recip.
	0	1	2–5	6	7

This section motivates the view that a tripartite syntactic structure underlies this template:

(30)	[[Modals	Agreement]	Clitics]
	0–1	2–5	6–7

Positions 0–1. Modals consist obligatorily of a modal root and optionally of a dubitative. These interact with marking on the verb to yield the tense,

[14] Hudson places Accessory/Dative in position 6 and Reflexive/Reciprocal in position 7. The reasons for my reorganization are (a) that Accessory and Reflexive/Reciprocal are in complementary distribution, (b) that Dative and Accessory are not, and (c) their order of cooccurrence is Dative first, Accessory second.

mood, and aspect of the whole clause. (For recent discussion of a similar system, see Nordlinger 1995 and Julien 2002 on Wambaya.) It is plausible, therefore, that these are part of the TMA system and that, like modal roots in other languages, they can host agreement and clitics.

Positions 2–5. φ-features that compose the middle part of the auxiliary cluster show locality effects, a hallmark of agreement. Specifically, there are four types of case-marked DPs that can register in positions 2–5:

(31) Subject > Accessory > Dative > Direct Object[15]

If several occur (e.g., subject, dative, and direct object), only the two highest on the hierarchy of noun phrases (i.e., subject and dative) agree. As the agreement hierarchy (31) replicates syntactic hierarchy (External Argument > High Applicatives > Low Applicatives > Internal Argument; see two paragraphs below), the agreement satisfies the Minimal Link Condition: the agreeing heads look for the nearest possible (i.e., syntactically highest) target.

The agreement categories are first inclusive, first exclusive, second, third for person, and singular, dual, plural for number. I will term the two types of agreement "subject agreement" and "object agreement" (henceforth, typographically, **subject** agreement is boldface, *object* italic, as in Table 7.3). Subject agreement always occurs, but object agreement may be absent, as with intransitives and some reflexives.[16]

Positions 6–7. There are semantic and syntactic reasons for supposing that the elements here are clitics. The Accessory, Dative, and Reflexive/Reciprocal (henceforth, simply 'Reflexive') display the range of meanings typical of applicatives (Pylkkänen 2002, Cuervo 2003) and are impervious to the locality effects of agreement. They occur whenever a semantically appropriate DP is present and do so whether that DP agrees (i.e., is represented in positions 2–5) or not. Double occurrence, in positions 2–5 and 6–7 is, then, reminiscent of clitic doubling. Details of these points are provided below.

The Accessory has a wide range of meanings, all affective and typical of applicatives: accompaniment ("He went with John", "I slept with the man"), affected location ("An ant is on my hand", "I fell over another man", "She put the dress on the girl"), ablative/allative ("He came up to us two", "He ran

[15] Given Hudson's comments (1978: 66), a more accurate hierarchy may be: Subject > Human Accessory > Human Dative > Accessory > Dative > Direct Object. This will not affect matters here.

[16] There are some differences in object agreement depending on the case/role and φ-feature composition of the agreeing DP (what Hudson calls "Paradigms I and II"). These are irrelevant to the discussion here and I abstract away from them. However, I suspect that these allomorphs reflect applicative height and should be considered in any closer examination of Walmatjari syntax.

away from us two in fear"), source ("We got fire from the people for the two kangaroos"), indirect object ("I asked the old woman about food").

In point of exponence, the accessory has two allomorphs: *nyanta* for third person singular, *rla* (identical with the dative) elsewhere (boldface). It is concomitant with accessory case marking on the noun, *nga*/*rla* (italics).[17]

(32) a. ngarpu-*nga* ma- rna-Ø- lu-**nyanta** ngunangani nganampa
father- AX AUX-1EX-3SG-PL-AX existed we.NOM
"We stayed with father" (H63)

b. wangki ma- Ø-rna-pangu-pila-**rla** marnani parri-jarra-rlu nganampa-*rla*
word.NOM AUX-3-1EX-PL- DL- AX was saying boy- DL- ERG us- AX
"The two boys were talking with us" (H63)

Accessory marking (in the auxiliary cluster or as case on nouns) may not cooccur with the Dative and Reflexive applicatives. As the auxiliary cluster registers dativity only when reflexive, the cooccurrence restriction is on Accessory and Reflexive; Accessory and Dative is derivative.

The Dative and the Reflexive are *rla* and *nyanu*:

(33) jularni pa- ji- lu- **rla-** **nyanu** wangki ngaju-wu piyirn-warnti-rlu
told AUX-1SG-3PL-DAT-REFL word I- DAT man- PL- ERG
"The men told me about themselves" (H68)

In this example, the Object agreement is for "me", the audience, and the Reflexive refers to the Subject "the men". If Object and Reflexive coincide, however, there is no Object agreement.

(34) a. kamparni pa- **lu-** rla- **nyanu** kuyi nganpayi-warnti-rlu
cooked AUX-3PL-DAT-REFL meat.NOM man- PL- ERG
"The men cooked meat for themselves" (H67)

b. nyumukkujirni pa- **lu-** **nyanu** piyirn-warnti-rlu
bathed AUX-3PL-REFL man- PL- ERG
"The men bathed themselves" (H68)

[17] 'H' numbers in the following examples refer to page numbers in Hudson (1978).

Without going into details, I observe that this recalls the different properties highlighted in Cuervo's discussion of dative reflexive clitic combinations in Spanish.

This justifies the tripartite division of (29) into modal roots, agreement, and clitics. I assume that the modal and agreement form a complex, to which the clitics are adjoined (30). As such, the clitics are higher than agreement and are linearized later; consequently, they are disregarded below.

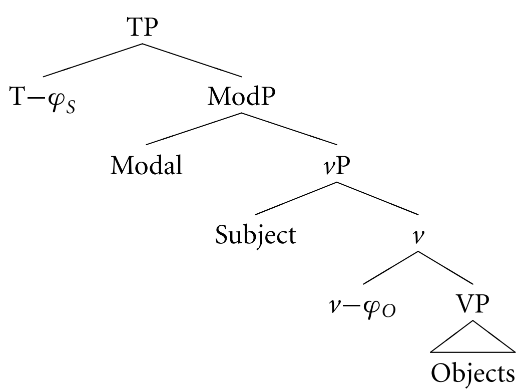
7.4.2 *Analysis*

Having now laid out the basic structure of the auxiliary cluster, we consider in detail the constituency of agreement, its middle part, in order to establish generalizations about the ordering of φ-bundles and their subparts. Section 7.4.2.1 presents the organization of the agreement features, teasing out in particular the different structures behind flanking and non-flanking cases. The analysis of Section 7.2.1 is applied to the flanking cases in Section 7.4.2.2 and compared with a purely syntactic analysis in Section 7.4.3.

7.4.2.1 *Syntax of agreement* In this section, I situate agreement in a plausible clause structure, in essence, nothing more than a standard phrase structure for transitive clauses, with φ-probes on both T and *v*. In addition, I suggest a language-specific displacement, affecting local φ-sets, to account for orders that the phrase structure alone cannot produce. This has the interesting property of predicting flanking precisely when both φ-sets are local.

The two φ-sets in the agreement cluster correspond to the two DPs in the sentence that are highest according to (31). This follows naturally if we assume the presence of two φ-probes, φ_O located on *v*, φ_S above it, on T, say.

(35)



The relative heights of the two probes ensure that the higher will always be valued by the subject and the lower, by the highest (direct or indirect) object;

hence, their mnemonics. Assuming φ_O-valuing to be part of a Case-checking process, (35) is unremarkable.

However, (31) does not determine the order of the valued φ-bundles; φ-complexity does; (36a), which recalls certain Romance data (Perlmutter 1971, Harris 1991, Poletto 2000), trumps (36b) where these conflict.

(36) WALMATJARI AGREEMENT ORDER
More φ-complex before less

a. Local precedes third. $S_{1/2}>O_3$ $O_{1/2}>S_3$
b. Subject precedes object. $S_{1/2}>O_{1/2}$ $S_3>O_3$

So, if φ_O is third person, *in situ* realization of the φ-sets in (35) yields the correct linear order, assuming the Modal has raised to T. As an example, consider 2PLS+3PLO. The structure, with irrelevant details removed, is:

$$[\ [[\mathrm{M}]\ \varphi_S] \ldots [\varphi_O]\ ]$$

It is important to emphasize here that the Modal and subject agreement form part of the same complex head, whereas object agreement is lower in the structure *in situ*. Following Julien (2002), the word-like appearance of the whole comes from the parts' being linearly adjacent when pronounced, not necessarily from their forming a syntactic whole, such as a complex head.

The lowest part of structure, φ_O, is realized first, [3PL] ⇔ /lu/. Next, the complex head [[M] φ_S] is targeted, immediately being made adjacent to the previously linearized material:

$$\begin{array}{c}[[\mathrm{M}]\ \varphi]\rightarrow\textbf{lu}\\ |\\ 2\mathrm{S}\\ |\\ \textsc{pl}\end{array}$$

Within, the complex head, vocabularization again proceeds root out, beginning with the Modal.

$$\begin{array}{c}[[\textbf{ma}]\ \varphi]\rightarrow\textbf{lu}\\ |\\ 2\mathrm{S}\\ |\\ \textsc{pl}\end{array}$$

Next, φ_S is made adjacent to the modal root, then vocabularized, [2S] ⇔ /n/ and [PL] ⇔ /ta/:

$$[\mathbf{ma}\to\begin{array}[t]{c}\varphi\\ \mid\\ \text{2S}\\ \mid\\ \textsc{pl}\end{array}]\to\mathbf{lu} \quad\Rightarrow\quad [\mathbf{ma}\to\begin{array}[t]{c}\mathbf{n}\\ \mid\\ \mathbf{ta}\end{array}]\to\mathbf{lu} \quad\equiv\quad [\mathbf{ma}\to\mathbf{n}\to\mathbf{ta}]\to\mathbf{lu}$$

Finally, the top node of the complex head is reached, which, as no further vocabulary items are introduced, results straightforwardly in *ma-**n**-**ta**-lu*. Notationally, the final square brackets are removed. No discontinuity results as the contents of the head, [ma→n→ta], is a perfect linear string, adjacent to another such string. All other third-person object cases are analogous.[18]

To account for the order reversal when the subject is third and the object local, I suggest that Walmatjari requires local φ-sets to be structurally adjacent to the modal root. Clearly, this makes no substantial difference to the previous cases. To illustrate its effect, consider 3PLS+2DLO, which, initially, undergoes the following change:

$$[\ [[\mathrm{M}]\ \begin{array}[t]{c}\varphi\\ \mid\\ \text{3S}\\ \mid\\ \textsc{pl}\end{array}]\ \ldots\ [\begin{array}[t]{c}\varphi\\ \mid\\ \text{2O}\\ \mid\\ \textsc{dl}\end{array}]\ ] \quad\Rightarrow\quad [\ [[[\mathrm{M}]\ \begin{array}[t]{c}\varphi\\ \mid\\ \text{2O}\\ \mid\\ \textsc{dl}\end{array}]\ \begin{array}[t]{c}\varphi\\ \mid\\ \text{3S}\\ \mid\\ \textsc{pl}\end{array}]\ \ldots\ \langle[\begin{array}[t]{c}\varphi\\ \mid\\ \text{2O}\\ \mid\\ \textsc{dl}\end{array}]\rangle\ ]$$

For purposes of vocabularization, only the complex head need be considered. Here, the root is targeted first and then the inner φ-set, which, initially, is made adjacent to the previously linearized material:

$$[[[\mathbf{ma}]\ \begin{array}[t]{c}\varphi\\ \mid\\ \text{2O}\\ \mid\\ \textsc{dl}\end{array}]\ \begin{array}[t]{c}\varphi\\ \mid\\ \text{3S}\\ \mid\\ \textsc{pl}\end{array}] \quad\Rightarrow\quad [[\mathbf{ma}\to\begin{array}[t]{c}\varphi\\ \mid\\ \text{2O}\\ \mid\\ \textsc{dl}\end{array}]\ \begin{array}[t]{c}\varphi\\ \mid\\ \text{3S}\\ \mid\\ \textsc{pl}\end{array}]$$

[18] With one exception, which neither Hudson nor I explain, 3PLS+3DLO, where the ordering is indeterminate, *pinya/pilangu-lu* ∼ *pa-lu-pinya/pilangu*. 3DLO is idiosyncratic in a second regard. The modal has three phonologically predictable forms: *ma* if the following consonant is nasal, Ø if the following consonant is *p* (a general phonological process), *pa* elsewhere. The only exception to this is 2/3DLS+3DLO, for which the modal is *ngu*. If this indicates a special morphosyntactic relationship between duals and the modal, then the ordering of 3PLS+3DLO may result from the same sensitivity. I leave this matter open.

Two vocabulary items are inserted, [2O] ⇔ /ny/ and [DL] ⇔ /pinya/:

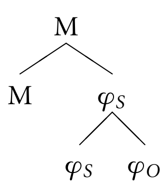
$$
\begin{array}{ccccc}
[[\text{ma}\rightarrow\text{ny}] & \varphi] & \equiv & [[\text{ma}\rightarrow\text{ny}\rightarrow\text{pinya}] & \varphi] \\
| & | & & & | \\
\text{pinya} & \text{3S} & & & \text{3S} \\
 & | & & & | \\
 & \textsc{pl} & & & \textsc{pl}
\end{array}
$$

Finally, the remaining head is made adjacent and vocabularized:

$$
\begin{array}{ccc}
[\mathbf{ma}\rightarrow\mathbf{ny}\rightarrow\mathbf{pinya}\rightarrow\varphi] & \Rightarrow & [\mathbf{ma}\rightarrow\mathbf{ny}\rightarrow\mathbf{pinya}\rightarrow\mathbf{lu}] \\
| & & \\
\text{3S} & & \\
| & & \\
\textsc{pl} & &
\end{array}
$$

Now, an interesting situation arises when both φ-sets are local, as the language requires both to be adjacent to the modal root. Prior to any movements, the structure is [[[M] φ_S] … [φ_O]]. Here, φ_O cannot adjoin to M without disrupting the structural adjacency between M and φ_S. Yet, if φ_O adjoins to φ_S, the movement targets the nearest position to M without disrupting other adjacency relations.

(37)



Note that (37) at once satisfies the adjacency requirement of both φ-sets without inducing an infinite regress—if φ_O can disrupt adjacency between M and φ_S, then φ_S might proceed to disrupt the relationship between M and φ_O, forcing φ_O to move yet again, and so on, producing a non-convergent derivation. This can be viewed as the product of Tucking In (Richards 2001).

Interestingly, (37) forces flanking. To illustrate, consider 2PLS+1EX.DLO:

$$
\begin{array}{ccc}
[\textsc{aux}\ [\varphi & [\varphi]]] \\
| & | \\
\text{2S} & \text{1}\textsc{ex}\text{O} \\
| & | \\
\textsc{pl} & \textsc{dl}
\end{array}
$$

Vocabularization of φ_O produces:

$$[\textsc{aux}\ [\begin{array}[t]{c}\varphi\\ | \\ 2S \\ | \\ \textsc{pl}\end{array}\ [\begin{array}[t]{c}\textbf{tarra}\\ | \\ \textbf{nya}\end{array}]]] \quad \equiv \quad [\textsc{aux}\ [\begin{array}[t]{c}\varphi\\ | \\ 2S \\ | \\ \textsc{pl}\end{array}\ [\textbf{tarra}\rightarrow\textbf{nya}]]]$$

Next, the remaining φ-set is linearized with respect to *tarra-nya*.

$$[\textsc{aux}\ [\begin{array}[t]{c}\varphi\\ | \\ 2S \\ | \\ \textsc{pl}\end{array}\rightarrow\textbf{tarra}\rightarrow\textbf{nya}]]$$

Vocabularization produces a frayed string, linearized as shown:

$$[\textsc{aux}\ [\begin{array}[t]{c}\textbf{n}\\ | \\ \textbf{lu}\end{array}\rightarrow\textbf{tarra}\rightarrow\textbf{nya}]] \quad \Rightarrow \quad [\textsc{aux}\ [\textbf{n}\rightarrow\textbf{tarra}\rightarrow\textbf{nya}\rightarrow\textbf{lu}]]$$

The final output is:

(38) ma- **n**-*tarra*-*nya*-**lu**
AUX-2-1EX- DL- PL

Similar is 1EX.PLS+2DLO, *ma-**rna**-ny-pinya-**lu***: the adjacent *ny-pinya* respectively realize 2 and DL, and the discontinuous ***rna**-…* *-**lu***, 1EX and PL.

So, to summarize, basic phrase structural considerations lead us to posit two φ-probes plus a displacement rule for local φ-sets. When both φ-sets are local this produces a structure from which flanking follows.

7.4.2.2 *Readjustments* As emphasized in Table 7.3, not all cases of discontinuous agreement result in flanking in Walmatjari. I now present these, arguing, in each case, that they represent phonological readjustments of the basic flanking order and, so, support the analysis of Section 7.2.1.

Consider, first, 1EX.DLS+2PLO, which presents no flanking: *ma-**rna**-nya-**lu***, rather than *ma-**rna**-ny-nya-**lu***, as straightforward exponence predicts. Simply, one of the adjacent /ny/'s has deleted. This case is typical of all that follow in that the surprising surface form conforms to a phonological shape that the underlying form violates:

(39) WALMATJARI CONSONANT-CLUSTER CONDITION
The only consonants (other than glides) permitted after nasals are *p*, *t*, *k*. (Orthographic note: *ng*, *ny*, *rl*, *rn* are digraphs representing the velar nasal, palatal nasal, retroflex lateral and retroflex nasal.)

Hudson does not formulate (39); however, it is, I think, correct for the language as a whole. Only surface *n-ny* is apparently exempt, all other violations undergoing repair by highly heterogeneous means: (i) deletion, (ii) deaffrication, (iii) allomorphy, (iv) epenthesis, (v) metathesis. I now review these briefly, building up to the most surprising, metathesis, which, contextualized in this way, is a reasonable means of accounting for non-flanking orders.

(i) Deletion, besides its exemplification above, arises with 1EX.PLS+2SGO, *ma-**rna**-ngu-**lu***, from *ma-**rna**-ny-ngu-**lu***, this time repairing /ny-ng/ rather than /ny-ny/. (ii) Deaffrication was also seen above: *tarra* in (38) is readjusted from *jarra* in Table 7.1 and (32b) following /n/. (iii) Allomorphy occurs, for instance, in the intransitive 2PL, *ma-**n**-**ta***, which exhibits *ta* for the more common *lu*, thereby avoiding /n-l/. (iv) Epenthesis occurs in 2DLS+1IN.PLO, for which we would expect *ma-**n**-rli-pangu-**pila***. The surface form separates /n-rl/ with [ta] in *ma-**n***[ta]*-rli-pangu-**pila***.[19] Epenthesis, of a different segment, occurs even without flanking: 2SGS+3SGO, underlyingly *ma-**n**-rla*, surfaces as *ma-**n***[u∼ku]*-rla*.

All of (i)–(iv) are still clearly, at core, cases of flanking. Let us now turn to (v) metathesis, to see how phonological repair sometimes disguises flanking. For 2PLS+1EX.PLO, the π-ordering is reversed, π-$\boldsymbol{\pi}$-ω-$\boldsymbol{\omega}$, and cannot be generated by cyclic, root out vocabularization. Rather, these produce *ma-**n**-rna-panya-**lu***. Observe, however, that this violates (39), owing to /n-rn/, which metathesis repairs. So, rather than posit a new underlying order, we can maintain flanking and posit metathesis as fifth repair. The result is π-reversal, *ma-rna-**n**-panya-**lu***.

Metathesis also occurs systematically with 2S+1SGO. Despite being the object, 1SGO is always initial, as in 2DLS+1SGO, *pa-ja-**n**-**pila*** (from *pa-**n**-ja-**pila***). Observe that metathesis here repairs /n-j/, the same configuration repaired by deaffrication (ii) above.

So, the alternative orders do not threaten a flanking analysis. On the contrary, given that the novel orders arise where flanking violates (39), exceptionality is expected, even if the means of repair are not.

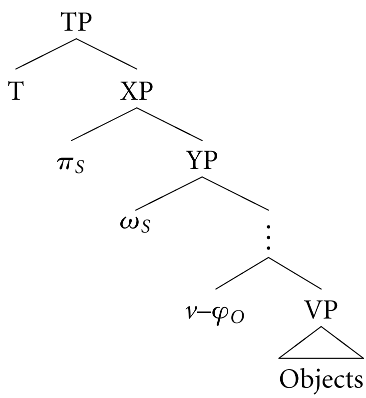
[19] Given that one of the arguments is plural and that [PL] ⇔ /ta/, one might wonder whether the purported epenthesis is multiple exponence. However, as *ta* surfaces in PL-less 2SGS+1IN.DLO, *ma-**n***[ta]*-rli-ngu* (from *ma-**n**-rli-ngu*), epenthesis is the correct analysis.

7.4.3 *A syntactic account?*

Having outlined how the various orders of agreement morphemes in the Walmatjari auxiliary cluster follow from the interaction of syntax, morphology and morphophonological repair, I now argue that these patterns do not result from syntax alone, even permitting a syntactic account the use of morphophonological repairs such as metathesis.

Naturally, any syntactic account would assume the phrase structure in (35). However, in order for discontinuities to be possible, the higher φ-probe must be decomposed into separate π- and ω-probes, with the latter lower, to give the order person-before-number.

(40)



When the object is third person, the correct order follows straightforwardly. When the object is local, we must assume that φ_O raises to a position above ω_S but no higher than π_S, giving the flanking pattern $[\pi_S\ [\varphi_O\ [\omega_S]]]$. If the subject happens to be third person, then $[\pi_S] \Leftrightarrow /\varnothing/$ reduces the flanking to $[\varnothing\ [\varphi_O\ [\omega_S]]] \equiv O_{1/2}{>}S_3$. Like the account offered above, then, this requires only a stipulation about movement of local object agreement. The account is syntactic, as opposed to morphological, in the sense that all ordering (other than reordering for phonological repair) is accomplished by standard syntactic operations.

However, two points count against it. First, internal to Walmatjari, facts about number agreement for first person inclusive subjects are problematic. More fully, π-agreement is identical for 1inS and 1inO (*rli* for 1in.dl, *rlipa* for 1in.pl), yet only the objects have ω-agreement. For instance, 1in.dlO is *rli-nya*, but 1in.dlS is only *rli*. If subject number is in an autonomous head, at times non-adjacent to subject person, then we would expect at the very least the default plural *lu*. Indeed, it seems hard to avoid concluding that (40) does not represent the phrase structure of all Walmatjari clauses, so that the syntactic account would require unpleasantly φ-dependent phrase structures. By contrast, this is easily accommodated on the account offered above, where subject person and subject number are together at the point of vocabularization. Second, where the morphosyntactic account succeeds in giving a unified analysis of both Walmatjari and Yimas and in tying this to ordering facts about person and number generally, the syntactic account covers Walmatjari alone. It does not extend to Yimas and does not explain, generally, why double discontinuities flank. In consequence, the morphosyntactic account is to be preferred.

7.5 Conclusion

The foregoing has attempted to answer three related questions: why agreement is discontinuous, why discontinuous agreement is person-left number-right, and why double discontinuities flank. The answers to all three questions reduce to how what is linearized when. Specifically, I have argued that linearization proceeds cyclically, root out, and exchanges dominance relations between syntactic objects for adjacency relations between those objects' phonological exponents, and that φ-features have the internal structure φ–π–ω, for which I have suggested a semantic explanation. Agreement is discontinuous when a φ-set, made adjacent to a linear string when vocabularization begins, receives multiple exponents: the discontinuity preserves linear adjacency between φ and the previously linearized material whilst preserving the dominance relation within the φ-set; the internal organization of the φ-set gives person-left number-right. Flanking arises because the hierarchically higher φ-set is linearized later, encasing the linear string of the lower φ-set.

Clearly, the answers offered are only semidependent: one can regard flanking as consequent from root-out vocabularization whilst seeking a different explanation for the left-right effect, or vice versa. Either way, however, I hope that the data and questions presented here will help to stimulate further research. However, to the extent that the foregoing convinces, it constitutes a case for modularity: semantics forces onto the syntax the internal structure of φ-sets, syntax forces onto the morphology the basic position of φ-sets, and morphology forces onto the linear string discontinuous and flanked exponence. Answers of this nature argue strongly for an interface-centered Phi Theory, which it is the purpose of this volume to promote.

TABLE 7.4 Walmatjari Auxiliary and Agreement Clusters

	1sgS	1in.dlS	1ex.dlS	1in.plS	1ex.plS
1sgO					
1in.dlO					
1ex.dlO					
1in.plO					
1ex.plO					
2sgO	ma-**rna**-*n*(*y*)-*ta* ma-**rna**-(*ny*)-*ngu*		pa-**jarrarna**-*n*(*y*)-*ta* pa-**jarrarna**-(*ny*)-*ngu*		ma-**rna**-*n*(*y*)-*ta*-**lu** ma-**rna**-(*ny*)-*ngu*-**lu**
2dlO	ma-**rna**-*ny*-*pinya* ma-**rna**-*ny*-*pinya*		pa-**jarrarna**-*ny*-*pinya* pa-**jarrarna**-*ny*-*pilangu*		ma-**rna**-*ny*-*pinya*-**lu** ma-**rna**-*ny*-*pilangu*-**lu**
2plO	ma-**rna**-(*ny*)-*nya* ma-**rna**-(*ny*)-*nyirrangu*		pa-**jarrarna**-(*ny*)-*nya* pa-**jarrarna**-(*ny*)-*nyirrangu*		ma-**rna**-(*ny*)-*nya*-**lu** ma-**rna**-(*ny*)-*nyirrangu*-**lu**
3sgO	ma-**rna**-Ø ma-**rna**-*rla*	pa-**rli**-Ø pa-**rli**-*rla*	pa-**jarra**-Ø pa-**jarra**-*rla*	pa-**rlipa**-Ø pa-**rlipa**-*rla*	ma-**rna**-**lu**-Ø ma-**rna**-**lu**-*rla*
3dlO	ma-**rna**-*pinya* ma-**rna**-*pilangu*	pa-**rli**-*pinya* pa-**rli**-*pilangu*	pa-**jarra**-*pinya* pa-**jarra**-*pilangu*	pa-**rli**(**pa**)-*pinya* pa-**rli**(**pa**)-*pilangu*	ma-**rna**-**lu**-*pinya* ma-**rna**-**lu**-*pilangu*
3plO	ma-**rna**-*nya* ma-**rna**-*nyanangu*	pa-**rli**-*nya* pa-**rli**-*nyanangu*	pa-**jarra**-*nya* pa-**jarra**-*nyanangu*	pa-**rlipa**-*nya* pa-**rlipa**-*nyanangu*	ma-**rna**-**lu**-*nya* ma-**rna**-**lu**-*nyanangu*

Key

TYPEFACE. **subject agreement**, *object agreement*, other material.

SYMBOLS. [*x*]: surface *x* is epenthetic. (*x*): underlying *x* deletes. ⟨*x*-*y*⟩: underlying *y*-*x* undergo metathesis. *x*∼*y*: *x* and *y* are free variants.

2sgS	2dlS	2plS	3sgS	3dlS	3plS
pa-⟨*ja*-**n**⟩	pa-⟨*ja*-**n**⟩-**pila**	pa-⟨*ja*-**n**⟩-**ta**	pa-*ja*-**Ø**	pa-*ja*-**pila**	pa-*ja*-**lu**
pa-⟨*ji*-**n**⟩	pa-⟨*ji*-**n**⟩-**pila**	pa-⟨*ji*-**n**⟩-**ta**	pa-*ji*-**Ø**	pa-*ji*-**pila**	pa-*ji*-**lu**
			pa-*rli-nya*-**Ø**	pa-*rli-nya*-**pila**	pa-*rli-nya*-**lu**
ma-**n**[ta]-*rli-ngu*			pa-*rli-ngu*-**Ø**	pa-*rli-ngu*-**pila**	pa-*rli-ngu*-**lu**
ma-**n**-*tarra-nya*	ma-**n**-*tarra-nya*-**pila**	ma-**n**-*tarra-nya*-**lu**	pa-*jarra-nya*-**Ø**	pa-*jarra-nya*-**pila**	pa-*jarra-nya*-**lu**
ma-**n**-*tarra-ngu*	ma-**n**-*tarra-ngu*-**pila**	ma-**n**-*tarra-ngu*-**lu**	pa-*jarra-ngu*-**Ø**	pa-*jarra-ngu*-**pila**	pa-*jarra-ngu*-**lu**
			pa-*rli*(*pa*)-*panya*-**Ø**	pa-*rli*(*pa*)-*panya*-**pila**	pa-*rli*(*pa*)-*panya*-**lu**
ma-**n**[ta]-*rli*(*pa*)-*pangu*	ma-**n**[ta]-*rli*(*pa*)-*pangu*-**pila**	ma-**n**[ta]-*rli*(*pa*)-*pangu*-**lu**	pa-*rli*(*pa*)-*pangu*-**Ø**	pa-*rli*(*pa*)-*pangu*-**pila**	pa-*rli*(*pa*)-*pangu*-**lu**
pa-⟨*rna*-**n**⟩-*panya*	pa-⟨*rna*-**n**⟩-*panya*-**pila**	pa-⟨*rna*-**n**⟩-*panya*-**lu**	pa-*rna-panya*-**Ø**	pa-*rna-panya*-**pila**	pa-*rna-panya*-**lu**
pa-⟨*rna*-**n**⟩-*pangu*	pa-⟨*rna*-**n**⟩-*pangu*-**pila**	pa-⟨*rna*-**n**⟩-*pangu*-**lu**	pa-*rna-pangu*-**Ø**	pa-*rna-pangu*-**pila**	pa-*rna-pangu*-**lu**
			ma-*n*(*y*)-*ta*-**Ø**	ma-*n*(*y*)-*ta*-**pila**	ma-*n*(*y*)-*ta*-**lu**
			ma-(*ny*)-*ngu*-**Ø**	ma-(*ny*)-*ngu*-**pila**	ma-(*ny*)-*ngu*-**lu**
			ma-*ny-pinya*-**Ø**	ma-*ny-pinya*-**pila**	ma-*ny-pinya*-**lu**
			ma-*ny-pilangu*-**Ø**	ma-*ny-pilangu*-**pila**	ma-*ny-pilangu*-**lu**
			ma-(*ny*)-*nya*-**Ø**	ma-(*ny*)-*nya*-**pila**	ma-(*ny*)-*nya*-**lu**
			ma-(*ny*)-*nyirrangu*-**Ø**	ma-(*ny*)-*nyirrangu*-**pila**	ma-(*ny*)-*nyirrangu*-**lu**
ma-**n**-Ø	ma-**n**-**pila**-Ø	ma-**n**-**ta**-Ø	pa~**Ø**-**Ø**-**Ø** ~ ma-**Ø**-*nyanta*	(pa)-**pila**-Ø	pa-**lu**-Ø
ma-**n**[u~ku]-*rla*	ma-**n**-**pila**-*rla*	ma-**n**-**ta**-*rla*	pa-**Ø**-*rla*	(pa)-**pila**-*rla*	pa-**lu**-*rla*
ma-**n**-*pinya*	ngu-**m**-**pil**(**a**)-*pinya*	ma-**n**-**ta**-*pinya*	(pa)-**Ø**-*pinya*	ngu-**pil**(**a**)-*pinya*	(pa)-*pinya*-**lu**~ pa-**lu**-*pinya*
ma-**n**-*pilangu*	ngu-**m**-**pil**(**a**)-*pilangu*	ma-**n**-**ta**-*pilangu*	(pa)-**Ø**-*pilangu*	ngu-**pil**(**a**)-*pilangu*	(pa)-*pilangu*-**lu** ~pa-**lu**-*pilangu*
ma-**n**-*nya*	ma-**n**-**pila**-*nya*	ma-**n**-**ta**-*nya*	ma-**Ø**-*nya*	(pa)-**pila**-*nya*	pa-**lu**-*nya*
ma-**n**-*nyanangu*	ma-**n**-**pila**-*nyanangu*	ma-**n**-**ta**-*nyanangu*	ma-**Ø**-*nyanangu*	(pa)-**pila**-*nyanangu*	pa-**lu**-*nyanangu*

TOP/BOTTOM FORMS. Top/bottom forms are Hudson's 'Paradigms I/II', very approximately, non-high applicative/high applicative.

Note: Though the above closely follows Hudson's original tables (1978: 72–75), it reflects the syntactic and morphophonological analysis given above.

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8

Third Person Marking in Menominee

JOCHEN TROMMER

8.1 Introduction

Recent models in feature theory (Harley and Ritter 2002; Béjar 2003) suggest highly articulated systems of φ-features which both substantially restrict possible person and number categories in human language and predict crosslinguistically observed asymmetries between features. A core assumption in this line of research is that what is descriptively called third person is not characterized by any specific features, but by the lack of features characteristic for first and second person. It follows that under structural competition, first and second person always win over third person since they are more specific. While this is the correct prediction for many phenomena, third person agreement in Menominee provides strong evidence against both claims: an adequate analysis of third person marking implies the assumption of an explicit feature characteristic for third person, and of higher prominence of third over non-third person. To solve this problem, I propose to capture person asymmetries not by feature structure, but by ranked violable constraints (Trommer 2003b,e, 2006), which allows us to relate the unusual preference of Menominee third person marking to the specific characteristics of its affixal inventory.

The chapter is organized as follows: In Section 8.2, I introduce person hierarchy effects in Menominee. Section 8.3 presents current accounts relating such effects to the structure of person features. Section 8.4 shows that Menominee third person marking is problematic for these approaches. An alternative constraint-based analysis of the data using binary features is provided in Section 8.5. In Section 8.6, I give additional evidence for binary person features and show that a feature system with such features does not necessarily overgenerate possible person categories. Section 8.7 is a short summary of the paper.

8.2 Hierarchy effects in Menominee

It is well known that in Algonquian languages such as Menominee pronominal clitics do not consistently agree with subject or object but with the argument which is higher on the person hierarchy 2 > 1 > 3 (cf., e.g., Valentine 2001, Zúñiga 2002). Thus in clauses with second person arguments the preverbal clitic refers to this argument no matter whether it is subject (1a, b) or object (1c):[1]

(1) a. **ke**-po·se- m "**thou** embarkest" (B150)
2- embark-[−3]

b. **ke**-na·n- ek- w "he fetches **thee**" (B154)
2- fetch-DIR-[+3]

c. **ke**-na·n-a·- w "**thou** fetchest him" (B152)
2- fetch-DIR-[+3]

If no second person argument is present, but a first person argument (2), the clitic marks first person. Only if no first or second person argument is present a third person clitic appears (3):[2]

(2) a. **ne**-po·se- m "**I** embark" (B150)
1- embark-[−3]

b. **ne**-na·n- ek-w "he fetches **me**" (B154)
1- fetch-DIR-[+3]

c. **ne**-na·n- a·- w "**I** fetch him" (B152)
1- fetch-DIR-[+3]

(3) **o**-po·se- n-an "**he** does not embark" (B150)
3-embark- π-NEG

A similar phenomenon can be found in a specific class of person and number agreement markers in Menominee. Here, there is agreement with a first person plural argument (subject or object) if there is one (4). Otherwise, there is agreement with the second or third person plural argument (5). Suppression of plural agreement with non-first person arguments leads to considerable ambiguity (e.g., (5c)). Since the difference between second and third person arguments is not differentiated by the relevant affixes, we get a contrast

[1] 'B' numbers below refer to Bloomfield (1962), the source of all Menominee data in this chapter.

[2] Third person clitics are also restricted to negative verb forms. See Section 8.4.2 for discussion and Section 8.5.5 for an analysis of this restriction.

between first and non-first person arguments and a preference for first person, which we can express by a person hierarchy 1 > 2,3:[3]

(4) a. kan ne-pu·se- n-**i·naw**- an
NEG 1- embark-π-[+1 +pl]-NEG
"**we** (EX) do not embark" (B168)

b. kan ne-na·tom-eko-n-i·**naw**- an
NEG 1- call- DIR-π-[+1 +pl]-NEG
"they/he do(es) not call **us** (EX)" (B170)

c. kan ne-nɛ·w-a·-n **i·naw**- an
NEG 1- see- DIR-π- [+1 +pl]-NEG
"**we** (EX) do not see him/them" (B169)

(5) a. kan o-po·se- n-**owa·w**- an
NEG 3-embark-π-[−1 +pl]-NEG
'**they** do not embark" (B168)

b. kan ke-po·se- n-**owa·w**- an
NEG 2- embark-π-[−1 +pl]-NEG
"**you** (PL) do not embark" (B168)

c. kan ke-nɛ·w-a·- n-**owaw**- an
NEG 2- see- DIR-π-[−1 +pl]-NEG
"**you** (PL) do not see him/**them**"
"you (SG) do not see **them**" (B169)

What both phenomena despite the differences have in common is that local person (first and second person) seems to be more prominent under competition than third person. This corresponds nicely to the often-made claim that third person is somewhat defective in comparison to first and second person. In the words of Benveniste (1950), third person is a non-person. In Section 8.3, I will introduce formal approaches which try to relate hierarchy effects in Algonquian directly to the formal representation of person features.

[3] *-owa·w* and *-i·naw* also occur in unnegated (independent order) forms where they cooccur with *-w*, and *-m*, with the only difference that 3PL arguments in unnegated forms are never expressed by *-owa·w*.

8.3 Feature-geometric accounts of person asymmetries

In early Distributed Morphology (Halle and Marantz 1993), competition for affixal slots in multi-argument agreement was driven by the stipulation that two syntactic feature structures have been fused into a single one allowing only the insertion of a single vocabulary item. This is for example the analysis of Halle and Marantz for Potawatomi, an Algonquian language closely related to Menominee. Subject and object clitic are fused and the preference for second person clitics is either achieved by stipulation or directly invoking a prominence hierarchy, as is schematically depicted in (6):

(6) Algonquian Pronominal Clitics in Halle and Marantz (1993)

$$\begin{array}{ccccccc} & [+2] & & & & [+1] & & \\ & & \searrow & & \swarrow & & & \\ [+2] > [+1] & & & [\quad] & & & \longrightarrow & [+2] \end{array}$$

However, most recent approaches to hierarchy effects in Algonquian have been reluctant to acknowledge feature hierarchies (or stipulation on VIs) as a primitive of linguistic theory, and have tried to relate these effects to the formal structure of person features. Thus Déchaine (1999) assumes that person features in Algonquian are represented as in (7):

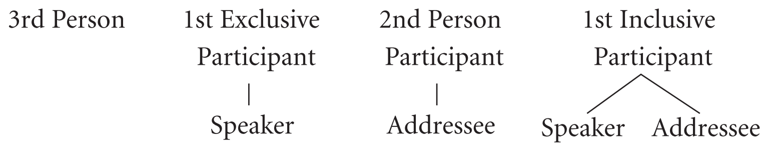
(7) Algonquian Person Features in Déchaine (1999)

3rd Person	1st Exclusive	2nd Person	1st Inclusive
−2	−2	+2	+2
|	|	|	|
−1	+1	−1	+1

In this feature system, the preference for first and second over third person can be derived from the fact that there is no specific feature for third person. If plus-valued items are preferred over minus-valued ones, third person can never win under competition since it is only specified by the negation of the specific features for first and second person.

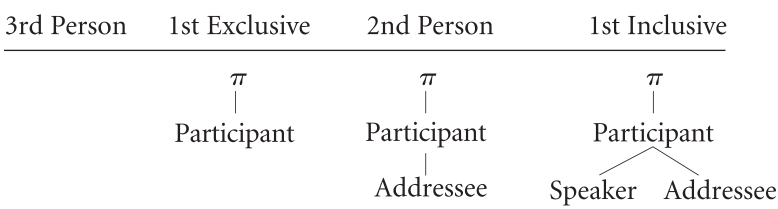
An even more radical formulation of this asymmetry can be found in the feature-geometric model of φ-features proposed in Harley and Ritter (2002; hereafter, H&R). Since the features in H&R's system are privative, no negative feature values exist. Third person is characterized by the complete lack of person features. Preference of local person categories over third person can now be related to the fact that these are more specific:

(8) Algonquian Person Features in Harley and Ritter (2002)



While H&R do not address hierarchy effects, Béjar (2003) uses a slightly modified feature geometry to develop a general model of hierarchy effects in syntactic terms, assuming that all person features are dominated to the exclusion of number and gender features by a generic feature node π (cf. also the chapters by Béjar and McGinnis in this volume):

(9) Algonquian Person Features in Béjar (2003)



Béjar assumes that hierarchy effects result from functional heads which can in principle attract features of subject or object. If the features of the closest NP do not exactly match the specification of the functional head, the search domain may be extended and the feature specification of the functional head is impoverished so that it can also target the other argument and match arguments with less specific features. For Algonquian clitics she assumes that the relevant functional head is specified as in the second person structure in (9) and immediately above the object. If the object is second person, a perfect match obtains. Otherwise the search domain is extended (by reprojecting F above the subject) to subject *and* object, and F is reduced to a structure containing only π. If the subject is second person now this is the closest controller and again second person agreement obtains. Otherwise, if the subject or object is first person, agreement is with this argument. Technically, there is no third person agreement in Algonquian, since third person is too underspecified to trigger agreement. Apparent third person agreement is analyzed as default agreement.

This approach makes three important claims. First, there is no specific feature characterizing third person. Third person means simply the lack of the features for first and second person. From this follows the second claim: no grammatical process can specifically target third person (i.e., to the exclusion of first and second person). Third, in hierarchy effects, local person (first and second) should always outrank third person, since the latter can never be more specific than first or second person. In the following section, I will provide evidence from Menominee that these claims are too strong.

8.4 Third person marking in Menominee

In addition to pronominal clitics and the person/number suffixes discussed in Section 8.2, Menominee also crossreferences subjects and objects by specific person suffixes. In the independent order, the main paradigm in Menominee (and Algonquian in general), the suffix *-w* appears if at least one of the arguments is third person, and *-m* appears if all arguments are first or second person:

(10) MENOMINEE THIRD PERSON MARKING (INDEPENDENT ORDER)

a. ne-po·se- m "I embark"
   1- embark-[−3]

b. ke-po·se- m "you (SG.) embark"
   2- embark-[−3]

c. po·se- w "he embarks"
   embark-[+3]

d. ne-na·n-ek- w "he fetches me"
   1- fetch-DIR-[+3]

e. ne-na·n-a·- w "I fetch him"
   1- fetch-DIR-[+3]

-m and *-w* are glossed as [−3] and [+3] in (10) since this allows us straightforwardly to capture the fact that they appear in exactly the same affixal position and exclude each other. However, in a feature-geometric approach to person, the feature [+3] does not exist. In addition, under a feature-geometric analysis the data in (10) also contradict the prediction that third person should never have preference over first and second person.

Basically, the same pattern as in the independent order can be observed in the conjunct order, an inflectional paradigm which is largely restricted to subordinate clauses and similar contexts.[4] Here the contrast between third and

[4] See Brittain (2001) for a detailed recent discussion of the morphosyntactic status of the conjunct order.

non-third person is expressed by a different set of suffixes, *-yan* for [−3] and *-t* for [+3], but again [+3] has precedence over [−3] (10c):

(11) Menominee Third Person Marking (Conjunct Order)

a. po·se- yan "when I/you(sg) embark"
embark-[−3]

b. po·se- t "when he embarks"
embark-[+3]

c. nɛ·w-e- t "when he sees me"
see- dir-[+3]

What the conjunct order data show is that the preference for third over non-third person in Menominee is not restricted to specific affixes (*-yan* and *-m* and *-t*/*-w* seem to be phonologically completely unrelated)[5] nor to the context of other grammatical items, such as the pronominal clitics: in the conjunct order, clitics are completely suppressed. Nonetheless, the same effects in third person marking hold.

Note also that *-w* and *-t* are not linked to other features which crossclassify third person arguments in Algonquian. Thus Menominee differentiates animate and inanimate gender nouns by nominal infection and verb agreement. Similar morphological reflexes are found for a second morphological contrast between two categories, traditionally labeled "proximate" and "obviative", where proximate roughly corresponds to NPs referring to topic information and obviative to NPs introducing new discourse referents. While in the examples given so far, *-w* indicates third person agreement with proximate animate NPs (e.g., (10c)), it is also used for inanimate (12a), and obviative (12b) NPs:[6]

(12) a. mɛhki·-w- (an) "it is red" ("they are red", inanimate, B151)
be red- [+3]-([+pl])

b. po·se- w- an "the other embarks" (obviative, B150)
embark-[+3]-[+obv]

More generally, every NP type which Menominee (and Algonquian) classifies as third person can trigger appearance of *-w*. This shows that *-w* cannot be marked for any other relevant feature, but is truly a third person marker.

[5] In the terms of Williams (1994), suppression of [−3] markers in Menominee is "metaparadigmatic." Cf. also Harley (this volume).

[6] (12b) is also used for obviative inanimate NPs. See Section 8.5.5 for a discussion of transitive verb forms involving agreement with inanimate third-person NPs and first/second person NPs.

8.4.1 *Default affixes in the* [±3] *system*

The data above are actually less problematic for the approach of Déchaine (1999) than for the feature-geometric approach. In Déchaine's representation of person, third person is defined as [−2 −1] which makes it possible to specify *-w* and *-m* as follows:

(13) -w : [−1 −2]
-m : [ ]

Since *-m* is now a default marker, preference for third over non-third person affixes is not due to any differences in the representation of person features. It results from the idiosyncratic underspecification of VIs and the Elsewhere Principle. However, this approach does not capture the parallels between third person marking in conjunct and independent order, nor does it allow any generalizations over the position and complementary distribution of these suffixes. Moreover, there is also a fatal empirical problem for an account of this type: there are affixes (not discussed so far) also occupying the position of third person markers, but having the properties of true default markers. Thus in the independent order, *-n* appears instead of *-w* and *-m* in the so-called indefinite actor forms which are restricted to clauses with unspecified subjects (14a). The same suffix also appears in most forms with the negative suffix *-an* (14b,c):[7]

(14) a. po·se- **n** "there is embarking" (B148)
embark-π

b. ne-po·n- a·- **n** "I put it in the pot" (B159)
1- put in pot-DIR-π

c. ne-nɛ·w- a·- **n**- an "I do not see him" (B169)
1- see- DIR π- NEG

Again, the data in the conjunct order are largely parallel. In indefinite actor forms, instead of *-yan* and *-t*, a third affix, *-k*, appears (conjunct order forms are never negated by affixes, cf. footnote 2):

(15) FORMS WITH *-k* (CONJUNCT ORDER)

a. po·se- n- **k** "when there is embarking" (B148)
embark-LRS-π

[7] Bloomfield calls this the negative order. However, the morphology of these forms is much closer to that of unnegated independent forms than to the conjunct order forms. In addition to *-an*, a word-level negator (*kan*) has to be used. Conjunct order forms do not have any affixal negation.

b. aktɛ- k "when **it** is there" (B170)
be there-π

The distribution of *-w*, *-m*, and *-n* is shown schematically in (16). The graphic shows that only *-m* and *-w* are restricted with respect to person: *-m* only appears in the presence of first or second person arguments, *-w* appears only in the context of third person arguments. *-n* can appear in the context of either and in the seemingly "personless" environment of indefinite actors which do not exhibit a person contrast in this position.

(16) Distribution of *-w*, *-m*, *-n*

	only [+3]	[+3] and [−3]	only [−3]	indef. actor
unnegated	*-w* (spanning only [+3] and [+3] and [−3])		*-m*	*-n*
negated	*-n* (spanning all columns)			

The fact that *-m* cannot be a default marker can also be shown in a second way. Suppose that *-m* is indeed a default (maximally underspecified) marker. Then, *-n* cannot be a default marker because it would then have the same distribution as *-m*.[8] Hence, *-n* should be specified for some content. If we consider the distribution of *-n* in the unnegated independent order, the only possible content for *-n* would be something like "unspecified actor". However, this is immediately contradicted by the fact that it also occurs with standardly specified arguments in negated forms. Hence the assumption that *-m* is a default marker leads to a paradox for the specification of *-n*. On the other hand, the assumption that *-n* is a default marker, and *-w/-m* mark [±3] is perfectly coherent if we assume that unspecified actors are verbally unspecified for person, and expression of the [±3] contrast is generally blocked in negated forms.

I conclude that a reanalysis of [+3] over [−3] prominence as preference for more specified affixes is not viable and the Menominee data pose a serious challenge to all approaches denying a binary feature [±3]. In the next subsection, I will provide further evidence that Menominee is governed by a constraint which allows only one affix specifying the feature [±3].

8.4.2 *Extending the* [±3] *restriction*

We have seen above that Menominee allows only one suffix specifying the feature [±3], either [±3] or [−3]. If one argument is [+3] and the other [−3], we do not find cooccurrence of *-m* and *-w* (or *-yan* and *-t*), but suppression

[8] In other words, forms with *-n* or *-m* would be in free variation.

of the [−3] marker. Interestingly, this restriction holds also across agreement and clitics. Thus, the third person clitic *o-* in Menominee, in addition to being suppressed in the context of first and second person clitics (cf. Section 8.2) is also impossible in unnegated independent-order forms (17b):[9]

(17) a. **o**-po·se- n-an "he does not embark" (B150)
3-embark-π-NEG

b. po·se- w "he embarks" (B150)
embark-3

Hence, if there is a third person clitic, there is no third person suffix and vice versa. This can be captured straightforwardly, if we assume that the restriction to one [±3] item extends from the agreement domain to a larger domain comprising agreement and clitics. In other words, the restriction identified so far as a constraint on agreement affixes only actually requires that in a complex containing an inflected verb and pronominal clitics only one third person marker (agreement affix or clitic) is allowed. Notice that in contrast to *o-*, first and second person clitics can cooccur with *-m* as well as with *-w*.

One could argue that the restriction of *o-* to negated forms is due to a context restriction, allowing this clitic only in the context of negation. However clitics are also used outside the verbal domain, namely in the marking of pronominal possessors. Here, *o-* appears to express a third person possessor without the restriction to negation:

(18) Pronominal Clitics in Nominal Possession

a.	***ne**-hka·t*	b.	***ke**-hka·t*	c.	***o**-hka·t*
	1- leg		2- leg		3-leg
	"my leg"		"your (SG) leg"		"his leg"

That *o-* occurs in nominal possession also provides direct evidence for the claim that the restriction to maximally one [±3] item extends to clitics: in contrast to other inflectional affixes (e.g., 1PL *-enaw*, cf. Section 8.2) which occur in verbal agreement *and* possessor marking, the [±3] suffixes are restricted to verbs.

A final piece of evidence for this restriction comes from negated forms where all arguments are inanimate. Recall that generally *-m* and *-w* in negated independent forms are neutralized to *-n*. The only exceptions to this generalization are intransitive forms with inanimate arguments (19a) and transitive forms with inanimate subject and object (19b). Here, [+3] *-w* is also retained in the negated forms:

[9] Recall that all clitics are suppressed in conjunct order forms.

(19) Negative Forms with Inanimate Arguments only

a. mɛhki·-w- an "it isn't red" (B151)
   red- [+3]-NEG

b. a·kuaqnɛ·sk-amemakat-w- an "it doesn't shade it" (B159)
   shade- DIR- [+3]-NEG

These forms are also exceptional in a second respect. While all other negated forms (except intransitive unspecified actor forms—recall that unspecified actors never exhibit [±3] marking by clitics or suffixes) appear together with pronominal clitics, the forms in (19) do not. Again, third person clitics and suffixes do not cooccur.

As with the restriction of clitics to negated verbal forms, one might adduce the fact that *o-* does not occur in the forms in (19) to lexical specification by stipulating that it is listed in the lexicon as [+3 +animate]. But once again, there is counterevidence from the nominal domain. In possessor marking, *o-* can crossreference inanimate as well as animate arguments. Thus *o-hka·t* in (18c) can refer to the leg of an animate being (a human or animal), but also to the leg of a chair.

(20) shows schematically the distribution of [+3] suffixes and clitics. While the distribution is complex, and not all forms have [+3] marking, there is never cooccurrence of [+3] clitics and suffixes:

(20) Distribution of [+3] Prefixes and Suffixes

<table>
<tr><th></th><th>only [+3]</th><th>[+3] and [−3]</th><th>only [−3]</th><th>indef. actor</th><th>only inanimate</th></tr>
<tr><td>unnegated</td><td colspan="2">[+3] prefix</td><td colspan="2">no [+3] marker</td><td rowspan="2">[+3] prefix</td></tr>
<tr><td>negated</td><td>[+3] suffix</td><td colspan="3">no [+3] marker</td></tr>
</table>

<table>
<tr><th></th><th>[+3] animate</th><th>[+3] inanimate</th><th>[−3]</th></tr>
<tr><td>possessor</td><td colspan="2">[+3] prefix</td><td>no [+3] marker</td></tr>
</table>

8.5 An OT-analysis

The data from Menominee third person marking show that deriving hierarchy effects from asymmetric feature representations which treat third person as the absence of person features is highly problematic. Menominee seems to require a binary feature [±3] and formal mechanisms to reconcile the existence of [+3] over [−3] prominence with the more familiar pattern, where first and second person are ranked above third. A natural alternative to a feature-geometric model is an account which derives hierarchy effects from grammatical constraints on the morphological realization of syntactic features. In this section, I will propose such an analysis of the Menominee data based on binary features and optimality-theoretic constraints, which avoids the problems raised by the feature-geometric approach.

8.5.1 *The theoretical framework*

The theoretical framework I will assume in the following is Distributed Optimality (Trommer 2002a,b, 2003c,d), a constraint-based approach to postsyntactic spellout merging concepts from Optimality Theory (OT; Prince and Smolensky 1993; McCarthy and Prince 1993, 1994, 1995) and Distributed Morphology (Halle and Marantz 1993). However, most of the arguments should carry over to any OT-based approach to spellout, where morphology has crucial access to syntactic structure (as e.g. in Noyer 1993; Grimshaw 1997, 2001). Distributed Optimality shares with Distributed Morphology the assumption that morphology is a separate module of the grammar interpreting the outputs of syntax, where the latter operates on abstract feature bundles (= heads = Lexical Items) without phonological content. Morphology assigns phonological content to syntactic structures by pairing word-like syntactic units (spell-out domains) with strings of vocabulary items (VIs) which combine (underspecified) morphosyntactic features with phonological content. Here is an illustrative example with the Menominee conjunct order verb form *po·se-yan*, "I embark":[10]

(21) SYNTAX–MORPHOLOGY MAPPING FOR *po·se-yan*

INPUT:	$[+V]_1$	$[+C\ +\text{conjunct}]_2$	$[+\text{agr}\ +\text{nom}\ +1\ -2\ -3]_3$
OUTPUT:	po·se:$[+V]_1$		yan:$[-3]_3$

The input consists of a complex of abstract heads, the output of a list of VIs. Both representations are linked by coindexing according to the principles of Correspondence Theory (McCarthy and Prince 1994, 1995). Note that not all underlying heads and features are necessarily expressed in the output (e.g., [+C +conjunct] and +1 in (21) are not).

Since the output of syntax serves in Distributed Optimality as the input to morphological computation, the grammar and, more specifically, the generator function GEN, generates, as usual in OT, an infinite candidate set of

[10] As in Distributed Morphology, the input to morphology in Distributed Optimality has actually an internal syntactic structure with consequences for domains of constraint application. Some aspects of this complex are discussed in Section 8.5.3.

output candidates which contains here all strings which consist exclusively of VIs compatible with input heads.[11] For example, a VI specifying the feature [+3] (e.g., w:[+3]) could not be part of any candidate for the input in (21) since there is no input head specifying [+3].

8.5.2 *Constraint Types*

Which heads are actually realized by VIs and the order of VIs in a given language depends on the language-specific ranking of universal constraints on markedness, faithfulness, and morpheme order. This is illustrated with the example from (21) and one very basic constraint PARSE F in (22):

(22) INPUT: $[+V]_1$ $[+C\ +\text{conjunct}]_2$ $[+\text{agr}\ +\text{nom}\ +1\ -2\ -3\ -\text{plural}]_3$

			PARSE F
☞	a.	po·se:$[+V]_1$ yan:$[-3]_3$	*******
	b.	po·se:$[+V]_1$	********!
	c.		********!*

PARSE F induces one constraint violation for each input feature which is not realized by a coindexed VI (e.g., +nom and −plural for (22a)). Since there are no appropriate VIs in the lexicon of Menominee to express these features, violations of PARSE F are unavoidable. However, they are minimized to guarantee maximal expression of features by VIs.

Apart from the lack of VIs, specific higher-ranked constraints can also induce violations of PARSE F. Constraints of the COHERENCE type require that maximally one VI of a certain type be present in a form.[12]

(23) COHERENCE X
Allow only one VI of type X in the output

For example, the constraint COHERENCE [3] allows only one instance of the feature [±3] in a given output. Each additional instance of this feature leads to constraint violations. COHERENCE [1 +plural] allows only one affix specifying 1 and +plural. Evidence for both constraints has been discussed in the preceding sections.

[11] See Trommer (2003c) for technical details.

[12] See Trommer (2003a,c) for a more technical definition of COHERENCE, based on indices, which also has important consequences for affix order. In particular, COHERENCE favors forms where different VIs corresponding to the same syntactic head (i.e., the result of "fission" in terms of Distributed Morphology, cf. Halle and Marantz 1993) are linearly adjacent. As far as I am aware, COHERENCE does not correspond in a straightforward way to constraints proposed in the phonological literature, though it bears some resemblance to CONTIGUITY and INTEGRITY (McCarthy and Prince 1995).

Preference for more prominent features in hierarchy effects is expressed by relativized parse constraints such as (24a,b):

(24) a. Parse $[\mathrm{P}]^{[+1]/[+3]}$

b. Parse $[\mathrm{P}]^{[+\mathrm{pl}]/[-\mathrm{pl}]}$

Parse $[\mathrm{P}]^{\mathrm{A/B}}$ is to be read as follows: Realize the person features of a syntactic head containing A if this is adjacent to a head containing B. Thus, Parse $[\mathrm{P}]^{[+2]/[+3]}$ requires that the person features of a [+2] head are spelled out by an affix, if it is neighbored by a [+3] head. Relativized parse constraints are related to prominence hierarchies such as [+1]/[+2] > [+3] or plural > non-plural by the general constraint schema in (25):

(25) If $A_1 \ldots A_n$ are distinct from $B_1 \ldots B_n$, and $A_i \geq B_i$ on a scale S_i $(1 \leq i \leq n)$, then there is a constraint Parse $[\textsc{agr}]^{[A_1 \ldots A_n]/[B_1 \ldots B_n]}$

Note that (25) allows derivation of Parse $[\mathrm{P}]^{[+1]/[+3]}$ from the scale [+1]/[+2] > [+3], but also $[\mathrm{P}]^{[+1]/[+2]}$ and $[\mathrm{P}]^{[+2]/[+1]}$, since first and second person are unranked on this scale. Among other facts, relativized parse constraints capture the fact that second person clitics are preferred over third person clitics in Menominee:

(26) Input: $[+\mathrm{Clitic}\ {+2}\ {-1}\ {-3}]_1[+\mathrm{Clitic}\ [+3]\ {-2}\ {-1}]_2$

	Parse $[\mathrm{P}]^{[+2]/[+3]}$
a. o:$[+3]_2$	*!
☞ b. ke:$[+2]_1$	

8.5.3 *Constraint Domains*

I assume that all constraints introduced so far can apply in different syntactically defined local domains.[13] More specifically, I assume the three domain types in (27):

(27) Domains for spellout constraints

Head Domain:	A set of string-adjacent heads belonging to the same extended projection
Chain Set:	The set of heads which are members of the chain *C*
Chain Domain:	A set *S* such that there exists a Head Domain *D* and *S* contains all heads of all chain sets occupying a position in *D*

[13] This is analogous to OT approaches to phonology, where phonological constraints apply in different prosodic domains such as the syllable or the phonological word.

The most straightforward of these domains is the Chain Set. I assume that coindexed clitics and agreement markers always are part of a chain with the schematic form in (28) (order irrelevant):

(28) DP_i $clitic_i$ V $agreement_i$

The Chain Set then amounts to {$clitic_i$, $agreement_i$} if DP_i is syntactically complex and to {$clitic_i$, $Agreement_i$, DP_i}, if DP_i is a bare head. Crucially, only indexed heads are visible for Chain Sets.

A Head Domain is roughly equivalent to the traditional notion of "morphological word." A simple example is a sequence of a verb stem with Tense, subject, and object agreement heads ([+V][+tense] [+agreement +nominative] [+agreement +accusative]). Note that the exact tree structure configuration of the heads is irrelevant for the definition of a Head Domain. Thus, [+V] could be placed adjacent to [+tense] by head movement to Tense or by remnant movement of a phrase containing [+V] to a higher specifier position. Important is only string adjacency. Another instance of a Head Domain that will become relevant is clitic clusters.

Finally, Chain Domains combine Head Domains with Chain Sets. In other words, a Chain Domain is a Head Domain plus all heads contained in chains with a position in this Head Domain. I will call constraints applying in Head Domains *Head-Level Constraints*, constraints applying in Chain Domains *Chain-Level Constraints*, and constraints on Chain Sets *Chain Constraints*.

8.5.4 *Accounting for the basic third-person preference in Menominee*

As already mentioned, the fact that Menominee allows only one third person marker can be captured now straightforwardly by COHERENCE [3]. To ensure that the constraint actually applies, it must be ranked above PARSE F because otherwise, the language would prefer to realize [+3] and [−3]:

(29) INPUT: I see him: $[-3\ +1]_1[+3\ -1]_2$

	COHERENCE [3]	PARSE F
☞ a. -w:$[+3]_2$		*
☞ b. -m:$[-3]_1$		*
c.		**!
d. -m:$[-3]_1$ -w:$[+3]_2$	*!	

Assuming that COHERENCE [3] applies in the Chain Domain, it also excludes cooccurrence of *-w*:[+3] and *o*-:[+3]. Now the crucial problem is to account for the fact that not *-m* is chosen, but *-w*. The constraint schema for the relativized PARSE constraint captures preference of first over third person, but not the opposite preference. On the other hand, modifying the schema in such a way that constraints such as PARSE [+3]/[+1] are also licensed seems to allow basically any conceivable preference among person features and deprive the system of any predictive power.

My solution of this problem is based on the observation that [+3] markers seem never to be preferred under competition over markers for [+1] or [+2], that is, markers for other plus-valued person features. What occurs (in Menominee) is only preference of a [+3] marker over a generic [−3] marker (i.e., one not differentiating between first and second person). The Menominee pattern in third person suffixes can then be captured by the second constraint schema in (30) which generally favors realization of plus-valued over corresponding minus-valued features:

(30) For each person feature *F* there is a PARSE constraint PARSE [+F]/[−F]

(30) licenses the constraint in (31) which allows us to derive correctly the choice for -*w* over -*m* in the example in (29), as shown in (32):

(31) PARSE [+3]/[−3] Prefer a [+3] marker over a [−3] marker

(32) INPUT: I see him: $[-3+1]_1[+3-1]_2$

	COHERENCE [3]	PARSE [+3]/[−3]	PARSE F
☞ a. -w:$[+3]_2$			*
b. -m:$[-3]_1$		*!	*
c.		*!	**
d. -m:$[-3]_1$-w:$[+3]_2$	*!		

The schema in (31) also licenses the constraints PARSE [+1]/[−1] and PARSE [+2]/[−2] which seem to be in principle plausible. Crucially, the constraints licensed by this schema will never interfere with patterns like Menominee clitics, where the lexicon does not provide an appropriate [−3] element (assuming that -*w* and -*t* as all other suffixes are marked by [+agr] or a similar feature excluding them for the expression of clitics.)

8.5.5 *Accounting for the whole range of data*

As we have seen, an approach in terms of preference constraints allows us to capture the basic third person marking pattern in Menominee which is highly problematic for feature-geometric approaches. In this subsection, I will show that this account straightforwardly extends to the whole range of data in third person marking that I have discussed in Section 8.4.

Recall that -*w* and -*m* are only licensed with verbs, not in nominal inflection. I assume that this is due to a context specification for the relevant VIs which restricts them to verbal contexts. If -*n* also has the same context restriction as in (33), this also explains why -*n* appears even though it does not specify any person features.

(33) a. -w [+3] / [+V]

b. -m [−3] / [+V]

c. -n [ ] / [+V]

As argued in Trommer (2003c), specific constraints favor appearance of context specifications (this accounts also for the fact that otherwise identical VIs with context restrictions are preferred to VIs without context restrictions, which is expressed in Distributed Morphology by the Subset Principle). I will implement this idea here by the constraint Context, which incurs a constraint violation for each underlying head which is not crossreferenced by a context restriction of a VI in the output. Appearance of -*n* serves to satisfy Context in forms such as intransitive indefinite actor forms where -*w* and -*m* are not possible (I assume here that this form involves an empty agreement head).

(34) Input: there is embarking: $[+V]_1$ $[\ ]_2$

	Parse F	Context
☞ a. $[+V]_1$ n:$[\quad]_2$ / [+V]		*
b. $[+V]_1$		**!

If -*m* or -*w* is present, the same context restriction is already realized, and appearance of -*n* would not lead to any improvement. Since unnecessary structure is generally suppressed in Distributed Optimality by alignment constraints, -*n* is blocked. This is illustrated in (35) by the antagonistic Alignment constraints L ⇦ [+V] and [+V] ⇨ R. L ⇦ [+V] counts a constraint violation for each VI between the verb root and the left edge of the spellout domain, and [+V] ⇨ R correspondingly for VIs between the verb root and the right edge of the spellout domain. A major effect of L ⇦ [+V] is that the root occurs to the left of all agreement affixes. While [+V] ⇨ R is ranked lower, and hence denied influence on affix order, it still favors forms with fewer VIs between the root and the right word edge, which causes suppression of -*n* in forms with -*m* or -*w*:

(35) Input: I embark: $[+V]_1[-3+1]_2$

		Parse F	Context	L ⇦ [+V]	[+V] ⇨ R
☞	a. $[+V]_1$ m:$[-3]_2$ / [+V]	*	*		*
	b. $[+V]_1$ m:$[-3]_2$ / [+V]-n:$[\ ]_2$ / [+V]	*	*		**!
	c. $[+V]_1$ -n:$[\ ]_2$ / [+V]	**!	*		*
	d. $[+V]_1$	**!*	**		

Let us turn now to the fact that third person clitics are suppressed in unnegated independent-order verbs even when no other clitic is licensed:

(36) a. o-po·se- n-an "**he** does not embark" (B150)
3-embark-π-NEG

b. po·se- w "**he** embarks" (B150)
embark-3

The fact that *-w* and *o-* cannot cooccur follows, as already mentioned, from the assumption that Coherence [3] applies in the Chain Domain. However, it also seems that appearance of the clitic and suppression of *-w* should fare equally well:

(37) Input: $[+3\ +\text{clitic}]_1$ $[+3\ +\text{agreement}]_1$

		Coherence [3]	Parse F
☞	a. -w:$[+3]_1$		*
☞	b. o:$[+3]_1$ -n:$[\ ]_1$		*
	c.		**!
	d. o:$[+3]_1$ -w:$[+3]_1$	*!	*

But recall that all constraints apply in different domains with possibly different rankings. Thus, assuming that Parse F can be ranked differently for the clitic and the agreement domain with the latter constraint ranked higher gives preference to third person marking by agreement suffixes, as required:[14]

14 Woolford (2000, 2003) argues for a similar pattern in Selayarese that crossreferencing an argument by clitics has precedence over realization by agreement. Thus, the preference for realization of [+3] by agreement in Menominee seems not to be due to a universal prioritization of agreement over clitics. It may well be that the differences between Selayarese and Menominee in this respect can be reduced to independent syntactic factors, but this is clearly beyond the scope of this paper.

(38) INPUT: [+3 +Cl]$_1$ [+3 +Agr]$_1$

	Domain:	COHERENCE [3] Chain	PARSE F Agreement	PARSE F Clitics
☞	a. -w:[+3]$_1$			*
	b. o:[+3]$_1$- -n:[ ]$_1$		*!	
	c.		*!	
	d. o:[+3]$_1$- -w:[+3]$_1$	*!		

For negated independent-order forms, I assume that an impoverishment constraint blocks realization of [+/−3] in the context of negation. Since this constraint applies in the agreement domain it does not affect clitics, and because [±3] is suppressed for agreement, COHERENCE [3] now allows the [+3] clitic:

(39) INPUT: [+3 +Cl]$_1$ [+3 +Agr]$_1$ [+Neg]$_2$

	Domain:	IMP [3]/[+Neg] Agr	COH [3] Chain	PARSE F Agreement	PARSE F Clitics
☞	a. o:[+3]$_1$- -n:[ ]$_1$			*	
	b. -n:[ ]$_1$			*	*!
	c. -w:[+3]$_1$	*!			*
	d. o:[+3]$_1$- -w:[+3]$_1$	*!	*		

While the suppression of *-w* here must be stipulated (as probably in every analysis), the fact that *o-* can appear just in this context in the verbal domain follows from independently motivated constraints.

As we have seen above, IMP [3]/[+Neg] is respected in all negated independent forms except the forms where all arguments are inanimate. This can be related to the prominence relation in (40), where [+hi(gh)] refers to the structurally highest argument of the predicate (i.e., the subject of a transitive or intransitive verb) and [+lo(w)] to the lowest argument (the subject of an intransitive or the object of a transitive verb).

(40) [+hi] > [+lo]

The schema in (25) now licenses the constraint PRS $[3]^{[+\text{hi} -\text{an}]/[+\text{lo} -\text{an}]}$ requiring that the feature [±3] of the highest inanimate argument must be realized if the lowest argument is also inanimate. If this constraint is also restricted to the agreement domain and ranked above IMP [3]/[+Neg], it correctly predicts the behavior of the inanimate only forms:

(41) Input: $[+3\ +\text{Cl}\ +\text{hi}\ +\text{lo}\ -\text{an}]_1\ [+3\ +\text{Agr}\ +\text{hi}\ +\text{lo}\ -\text{an}]_1\ [+\text{Neg}]_2$

Domain:	PRS $[3]^{[+\text{hi}-\text{an}]/[+\text{lo}-\text{an}]}$ Agr	IMP [3]/[+Neg] Agr	Coh [3] Chain	Parse F Agr	Parse F Clitics
a. o:$[+3]_1$- -n:$[\ ]_1$	*!			*	
b. -n:$[\ ]_1$	*!			*	*
☞ c. -w $[+3]_1$		*			*
d. o:$[+3]_1$- -w:$[+3]_1$		*	*!		

This analysis also accounts for the different distribution of *o*- with verbal and nominal forms. In nominal forms, [±3] agreement suffixes cannot appear since their context restrictions are not met. Therefore no conflict arises with Coherence [3] and *o*- appears for all third person possessors. On the other hand, in verbal forms, the specific constraint ranking in Menominee ensures that *o*- can only appear if other constraints suppress -*w* or -*m* which highly restricts the occurrence of *o*-.

I turn finally to a pattern which is especially interesting since it seems to provide counterevidence to the assumption that [+3] is ranked higher than [−3] in Menominee. In transitive forms with one inanimate and one first/second person argument -*m* appears, not -*w*:

(42) Transitive Forms with Inanimate and First/Second Person Argument

a. ne-po·n- ϵ·- **m**-enaw "we (ex) put it in the pot" (B159)
1- put in pot-dir-π-[+1 + pl]

b. ke-po·n- ϵ·- **m**-uaw "you (pl) put it in the pot" (B159)
2- put in pot-dir-π-[−1 +pl]

c. ke-nϵ·qn-ek- **m**- enaw "it kills us (ex)" (B154)
1- kill- dir-[−3]-[+1 +pl]

d. ke-nϵ·qn-ek- **m**- uaw "it kills you (pl)" (B154)
2- kill- dir-[−3]-[−1 + pl]

As we have seen above, forms with inanimate arguments only take [+3] -*w*. Hence, given the general preference for [+3] over [−3] in Menominee, we expect also in these cases -*w* instead of -*m*. However, these forms also involve a second prominence contrast, namely one between animate and inanimate. Thus given the hierarchy [+animate] > [−animate], the schema in (25) also licenses the constraint in (43):

(43) Parse $[3]^{[+\text{an}]/[-\text{an}]}$

If this constraint is ranked higher than PARSE [+3]/[−3] we get the correct result for the data in (43). I disregard the possible appearance of a [+3] clitic here because this is independently suppressed by the constraints governing competition among clitics (in effect *o*- is blocked in favor of *ke*-):

(44) INPUT: $[+3\ {+an}\ {+Agr}]_1$ $[+3\ {-an}\ {+Agr}]_2$

	Domain:	COHERENCE [3] Chain	PARSE $[3]^{[+an]/[-an]}$ Agr	PRS [+3]/[−3] Agr
☞ a.	-m:$[-3]_1$			*
b.	-w:$[-3]_2$		*!	
c. -m:$[+3]_1$	-w:$[-3]_2$	*!		

The analysis so far shows that implementing prominence effects by constraints related in a principled way to prominence hierarchies not only allows us to capture the restriction to one third person marker and preference for [+3] over [−3] in Menominee in a straightforward way unavailable in a feature-geometric approach, but also extends to intricate details of the distribution of third person markers in the language. However, this approach crucially depends on the assumption of a feature system comprising three binary person features. In the next section, I will provide further evidence that such a system is empirically motivated and theoretically sound.

8.6 The status of binary person features

This section has two parts. In Subsection 8.6.1, I discuss empirical evidence that also the features [±1] and [±2] are binary-valued. In Subsection 8.6.2, I show that the main objection against a system with three binary-valued person features, the claim that it overgenerates possible person categories, is not valid, given a careful definition of the semantics for the single person features.

8.6.1 *Additional evidence for binary person features*

Below, I repeat the data from (4) and (5) displaying once again the basic pattern of plural marking in Menominee. -*i·naw* marks plural for first person arguments, and -*owa·w* for arguments which are not first person. Both occur exactly in the same morphological template position and are mutually exclusive, hence cannot occur together:

(45) a. kan ne-pu·se- n-i·naw- an
NEG 1- embark-π-[+1+pl]-NEG
"we (EX) do not embark" (B168)

b. kan ne-na·tom-eko-n-**i·naw**- an
NEG 1- call- DIR-π-[+1 +PL]-NEG
"they/he do(es) not call **US** (**EX**)" (B170)

c. kan ne-nє·w-a·- n-**i·naw**- an
NEG 1- see- DIR- π-[+1 +pl]-NEG
"**we** (**EX**) do not see him/them" (B169)

(46) a. kan o-po·se- n-**owa·w**- an
NEG 3-embark-π-[−1 +pl]-NEG
"**they** do not embark" (B168)

b. kan ke-po·se- n-**owa·w**- an
NEG 2- embark-π-[−1 +pl]-NEG
"**you** (PL) do not embark" (B168)

c. kan ke-nє·w-a·- n-**owaw**- an
NEG 2- see- DIR-π-[−1 +pl]-NEG
"**you** (PL) do not see him/**them**"
"you (SG) do not see **them**" (B169)

In a theory where the surface position and mutual exclusivity of affixes are determined largely by the feature content of the pertaining VIs, this is direct evidence that *-owa·w* marks [−1 +plural], just as *-i·naw* does for [+1 +plural]. That *-owa·w* is suppressed in the context of *-i·naw* can then be captured straightforwardly in the approach introduced in Section 8.5 using the following constraints:

(47) CONSTRAINTS ON THE DISTRIBUTION OF *-i·naw* and *-owa·w*

a. COHERENCE [1 +plural]

b. PARSE $\mathrm{pl}^{[+1][+2]}$

c. PARSE $\mathrm{pl}^{[+1][+3]}$

One could argue that *-owa*·w is not specified [−1 +plural], but simply [+plural], and that the COHERENCE constraint in (47a) as well as the constraints responsible for the position of both affixes target only this feature. That *-owa·w* never expresses plural for first person NPs could then be attributed to the fact that for this case a more specific affix (namely *-i·naw*) is available. However, an analysis of this type is flawed since there is another plural marker in verb agreement with different properties.

Thus in unnegated independent-order verbs, agreement with 3PL proximate NPs is expressed by the suffix *-ak*, not by *-owa·w*. This affix occurs later in the suffix string than *-owa·w*[15] and *-i·naw* and is not in complementary distribution with these markers:

(48) PLURAL MARKING WITH *-ak*

a. po·se-w- **ak**
call- [+3]-[+pl]
"**they** embark" (B168)

b. ne-na·n- a·- w- e·naw- **ak**
1- fetch-DIR-[+3]-[+1 +pl]-[+pl]
"we (EX) fetch **them**" (B168)

c. ke-na·n- a·- w- wa·w- **ak**
2- fetch-DIR-[+3]-[−1 +pl]-[+pl]
"you (PL) fetch **them**" (B168)

d. ne-na·n- ek- w- e·naw- **ak**
1- fetch-DIR-[+3]-[+1 +pl]-[+PL]
"**they** fetch us (EX)" (B168)

e. ke-na·n- ek- w- wa·w- **ak**
2- fetch-DIR-[+3]-[−1 +pl]-[+pl]
"**they** fetch you (PL)" (B168)

Since *-ak* must specify [+plural],[16] the vocabulary entry for *-owa·w* as well as the COHERENCE constraint in (47a) must specify [−1 +plural], not just [+plural], because otherwise the constraint would also block cooccurrence of *-ak* with the other plural markers. Similar points hold for the constraints relevant for affix position. But of course this presupposes that [±1] is a binary-valued feature.

Further evidence for the binary features [±3] and [±1] comes from the so-called marked-scenario (MS) affix *a*- in the Kiranti language Dumi, which according to van Driem expresses "all scenarios involving a first or second person actant except those with a first person agent or subject" (van Driem 1993: 123). (49) shows the contexts where it appears ("marked") and where it does not ("unmarked"). (50) and (51) give concrete examples.[17]

[15] *-ak* also occurs after specific tense/aspect markers while these are preceded by *-i·naw* and *-owa·w*.

[16] Following a suggestion by Monica Macaulay (p.c.), I assume that *-ak* actually is specified as [+plural +proximate]. This predicts that it occurs more rightwards than the other plural markers, since plural markers also specifying person crosslinguistically occur more to the left than plural markers without additional person specification (Trommer, 2003d).

[17] Dual forms are given here because they are morphologically especially transparent, but exactly the same distribution of *a*- is found with singular and plural arguments. VD page numbers refer to van Driem (1993).

(49)

Marked	Unmarked
2→1	1→2
3→1	1→3
3→2	3→3
2→3	1
2	3

(50) Dumi Verb Forms Marked by *a*-

a. **a**- luph-ɨ
ms-catch-[+1−2 +dual]
"you (dl)/they (dl) caught us (dl.ex)" (VD109)

b. **a**- luph-i "they (dl) caught you (dl)" (VD110)
ms-catch-[+dual]

c. **a**- luph- i "you (dl) caught them (dl)" (VD109)
ms-catch-[+dual]

d. **a**- phɨkh-i "you (dl) got up" (VD97)
ms-get up-[+dual]

(51) Dumi Verb Forms Not Marked by *a*-

a. luph- ɨ "we(dl.ex) caught you (dl)/them (dl)" (VD109)
catch-[+1−2 +dual]

b. luph- si "they (dl) caught them (dl)" (VD110)
catch-[+dual]

c. phɨ kh-i "they (dl)/we (dl) got up" (VD97)
get up-[−dual]

Without minus-values for [±1] and [±3] there is no straightforward account for this pattern. However, assuming binary features, *a*- can be simply characterized as [+high −1][−3], implying that the affix occurs exactly then if (a) the highest argument is [−1] (i.e., second or third person) and (b) there is a non-third person argument. Second person arguments fulfill both conditions at the same time (i.e., correspond to both feature structures). In combinations of third person subjects with first/second person objects, the subject corresponds to the first structure, and the object to the second one:

(52)

Marked		Unmarked	
$2_s \rightarrow 1_o$	$[+hi\ -1]_s[-3]_{s,o}$	$1_s \rightarrow 2_o$	$^*[+hi\ -1]\ \ [-3]_{s,o}$
$3_s \rightarrow 1_o$	$[+hi\ -1]_s[-3]_o$	$1_s \rightarrow 3_o$	$^*[+hi\ -1]\ \ [-3]_s$
$3_s \rightarrow 2_o$	$[+hi\ -1]_s[-3]_o$	$3_s \rightarrow 3_o$	$[+hi\ -1]_s{}^*[-3]$
$2_s \rightarrow 3_o$	$[+hi\ -1]_s[-3]_s$	1_s	$^*[+hi\ -1]\ \ [-3]_s$
2_s	$[+hi\ -1]_s[-3]_s$	3_s	$[+hi\ -1]_s{}^*[-3]$

The evidence presented so far seems to be consistent with the feature system developed in Halle (1997), which he illustrates for Warlpiri as follows:

(53) WARLPIRI PERSON FEATURES in Halle (1997)

[+1 +3]	[+1 −3]	[−1 −3]	[−1 +3]
1st person exclusive	1st person inclusive	2nd person	3rd person

However, there is evidence in Menominee as well as in Dumi that this restricted system is insufficient and we need actually the richer feature system in (54):

(54) FEATURE SYSTEM WITH 3 BINARY FEATURES

[+1 −2 −3]	[+1 −2 −3]	[−1 +3 −3]	[−1 −2 +3]
1st person exclusive	1st person inclusive	2nd person	3rd person

Recall first that in Dumi verb forms with a third person subject and a first person exclusive object are marked by *a*-:

(55) **a**- luph- ɨ
MS-catch-[+1−2 +dual]
"you (DL)/they (DL) caught us (DL.EX)" (VD109)

In the feature representation in (54), this is predicted since (55) is represented as (56b), where the first feature structure of the lexical entry for *a*- (56b) is matched by the third person subject, and the second feature structure by the [−3] of the object. Halle's system predicts incorrectly that *a*- doesn't appear because the first person exclusive object would be analyzed as [+3]:

(56) a. [+high−1][−**3**]
b. [+**high** −1 −2 +**3**] [−high +1 −2 −**3**]
c. *[+**high** −**1** +**3**] [−high +1 +**3**]

Consider next the implications of Halle's feature system for Menominee, especially the pronominal clitics. Since Halle does not have a feature specific to second person, we would have to assume that *ke*- marks [−3] which would correctly predict that it does not occur in the first person exclusive, but in all other non-third person plural forms:

(57) a. **ne**-po·se- m "I embark" (B150)
1- embark-π

b. **ne**-po·se- m-enaw "**we** (EX) embark" (B150)
1- embark-π- 1PL

c. **ke**-po·se- q "**we** (IN.) embark" (B150)
2- embark-1PL

d. **ke**-pu·se- m-waw "**you** (PL) embark" (B150)
2- embark-π- [−1 + plural]

Since [+3] in Halle's system seems to be appropriate for all sets of entities containing at least one element which is not a participant in the speech event, [−3], and hence *ke-* should be appropriate for the sets containing only the hearer or only the speaker, hence 1SG and 2SG. While this is correct for 2SG (58a), we get the wrong result for 1SG (58b):

(58) a. **ke**-po·se- m "**you** (SG) embark" (B150)
2- embark-π

b. **ne**-po·se- m "**I** embark" (B150)
1- embark-π

Hence again the data show that we need the richer feature system in (54). A final piece of evidence against differentiating inclusive and exclusive by invoking [±3] comes from the distribution of *-m* and *-w*. While inclusive forms without further tense/aspect affixes have neither, but only the irregular suffix *-q* which also suppresses the regular 1PL marker *-enaw* (57c), we get more transparent forms in the so-called preterit (59a) and quotative modes (59b) which have further affixation.[18]

(59) a. ke-ma·cia-**m**-eno-pah "but we (IN) did set out" (B163)
2- set out-π- 1PL- PRET

b. ke-pi·t- o·- **m**-enaw-en "it is said that we (IN) bring it" (B161)
2- bring-DIR-π-1PL- QUOT

Crucially, all first person arguments, whether exclusive or inclusive trigger *-m*. If this is analyzed correctly as a marker for [−3], then this provides strong evidence that exclusive and inclusive in the language are distinguished by [±2], not by [±3]. While Halle admits that some languages may have the feature

[18] In (59a), *enaw-epah* fuses by a general phonological process to *enopah*.

system [± 1 ± 2] instead of [± 1 ± 3], this is not an option here. Menominee seems to provide evidence for both the contrast [± 3] and [± 2].

8.6.2 *Binary features and possible person categories*

A major argument for feature-geometric approaches to features is that the possible configurations they allow to form match exactly the possible category inventories of human languages. Thus assuming that person systems have maximally four categories (first person exclusive and inclusive, second and third person), the feature geometry of Harley and Ritter (2002) generates exactly these. In contrast to this, a system with three binary person features seems to allow for 2^3, i.e., eight combinations, which is far beyond this inventory. In this section, following a similar proposal for number features in Harbour (2007) (cf. also Harbour, this volume), I will propose an alternative approach to restricting person categories which is based on the semantics of single features, where only those combinations of features are possible which result in logically consistent descriptions of referents. (60) shows the meaning postulates I will assume for single person feature values.

(60) Semantics of Person Features

[+1] An FS containing [+1] denotes a non-empty group containing the speaker
[−1] An FS containing [−1] denotes a non-empty group **not** containing the speaker
[+2] An FS containing [+2] denotes a non-empty group containing the hearer
[−2] An FS containing [−2] denotes a non-empty group **not** containing the hearer
[+3] An FS containing [+3] denotes a non-empty group containing exclusively non-SAPs
[−3] An FS containing [−3] denotes a non-empty group **not** containing exclusively non-SAPs

These definitions are based on the assumption that feature structures (FSs) containing φ-features always denote groups. Thus the semantics of the equivalent of "I" is not the speaker, but a group containing the speaker and nothing else. The speaker and the hearer are conceptualized as two privileged participants of a specific speech act. In other words, in a given speech act, there is exactly one speaker and exactly one hearer. "We" in this system denotes a group containing the speaker and other members (which are not the speaker), but not a group of different speakers. (61) shows the possible combinations of these features and their denotations.

(61) Possible Person Categories

3rd person	[+3 −1 −2]	a nonempty group containing exclusively non-SAPs and not containing speaker or hearer
1st exclusive	[−3 +1 −2]	a nonempty group **not** containing exclusively non-SAPs containing the speaker but not the hearer
1st inclusive	[−3 +1 +2]	a nonempty group **not** containing exclusively non-SAPs containing the speaker and the hearer
2nd person	[−3 −1 +2]	a nonempty group **not** containing exclusively non-SAPs containing the hearer but not the speaker

The inventory in (61) exactly corresponds to the standard inventory of person categories which is also predicted by feature-geometric approaches. Now, all other possible combinations of person features lead to semantic descriptions which are logically inconsistent and therefore ill-formed:

(62) Impossible Person Categories

a.	*[+3 +1 +2]	a nonempty group containing exclusively non-SAPs and containing the speaker and the hearer
b.	*[+3 +1 −2]	a nonempty group containing exclusively non-SAPs and containing the speaker but not the hearer
c.	*[+3 −1 +2]	a nonempty group containing exclusively non-SAPs and containing the hearer but not the speaker
d.	*[−3 −1 −2]	a nonempty group **not** containing exclusively non-SAPs and not containing the hearer or the speaker

Thus the description in (62a) denotes a group which does not contain speaker and hearer and at the same time contains them. For similar reasons (62b) and (62c) are excluded. (62d) requires a group which neither contains the hearer nor the speaker nor anything else, hence an empty group. Since the group is at the same time required to be nonempty, we get again a contradiction.

Now assuming that logically inconsistent descriptions do not denote at all, possible person categories can now be simply defined as the combinations of all person features which denote groups.

8.7 Summary

In this paper, I have shown, using data from Menominee third person marking that a feature-geometric approach to person features and hierarchy effects faces serious problems. I have proposed an alternative account of the Menominee data which avoids the problems of the feature-geometric model, but requires a rich inventory of binary person features. Finally, I have argued that there is additional evidence for binary person features, and that such a system does not necessarily lead to an overgeneration of possible person categories. These results are in line with Harbour (2007) who argues for binary number features based on data from Kiowa.

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9

When is a Syncretism more than a Syncretism? Impoverishment, Metasyncretism, and Underspecification

HEIDI HARLEY

9.1 Introduction: Syncretism and Distributed Morphology

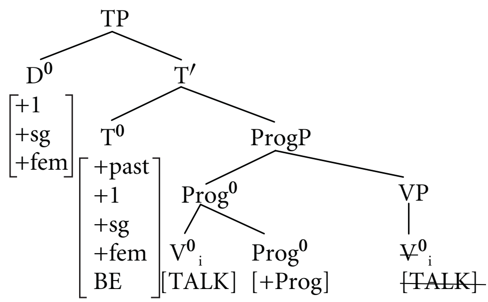
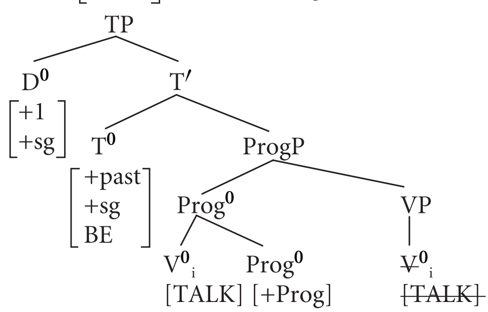
Syncretism occurs when different combinations of morphosyntactic feature values are represented by the same form. For instance, of the various forms of the past tense of the English verb *to be,* 1SG and 3SG syncretize, and so do 2SG, 1PL, 2PL and 3PL.

(1)

be, *past*	SG	PL
1	*was*	*were*
2	*were*	*were*
3	*was*	*were*

In Distributed Morphology (DM) terms, syncretism occurs when the same *vocabulary item* discharges the positions-of-exponence associated with more than one feature bundle (when a single vocabulary item "realizes" more than one combination of features in a syntactic terminal node). In (2), a DM derivation of the surface form of the sentence *I was talking* is provided, so that the realizational nature of the theory is clear, as well as the relationship between the syntactic derivation and the surface form.

(2) A Distributed Morphology Derivation

	Operation	Output
a.	**Syntax:** Construct Numeration by selecting feature(bundle)s.	{BE, [+1 +sg +fem]$_{\mathrm{D}}$, [+past]$_{\mathrm{T}}$, TALK, [+prog]}
b.	**Syntax:** Construct interpretable sentence structure by Merge, Move of feature(bundle)s. (The output of this step is sent to LF for semantic interpretation, and to PF for Spell Out.)	
c.	**Morphology:** Manipulate makeup of terminal bundles to conform to language-specific requirements (e.g., by Impoverishment, on which more anon).	
d.	**Morphology:** Realize (or "discharge") the terminal nodes of the syntactic tree by inserting Vocabulary Items into them, giving them phonological content.	[[/aj/]$_{\mathrm{D}}$ [[/wʌz/]$_{\mathrm{T^0}}$ [[/tɑk/]$_{\mathrm{V}}$[/ɪŋ/]$_{\mathrm{Prog}}$]$_{\mathrm{Prog}}$]$_{\mathrm{T'}}$]$_{\mathrm{TP}}$
e.	**Phonology:** Make morphophonological and phonological alterations to input as necessary to arrive at the optimal phonological form.	[ˈajwəzˈtʰɑkɨn]

In most realizational morphological theories, including DM, it is a methodological assumption that the most desirable way to treat syncretism is via underspecification. Only if underspecification fails should more powerful tools of the theory be appealed to, such as an Impoverishment rule (DM) or a Rule of Referral (Paradigm Function Morphology, among others).

Williams (1994) pointed out that metapatterns of syncretism exist in some grammars, and argued that a notion of a metaparadigm as a primitive property of the grammar was necessary to capture these general patterns. Bobaljik (2001) and Frampton (2002) have shown, however, that metaparadigms aren't necessary or desirable; in DM, pre-realization Impoverishment rules can do the same job (as can pre-realization Rules of Referral in formalisms like Paradigm-Function Morphology, though the case for the more powerful Rules of Referral as against more restrictive Impoverishment would have to be argued).[1]

In this paper, I will re-examine and repeat the core message of Bobaljik (2001) and Frampton (2002), illustrating with several examples. I will, additionally, show that underspecification of VIs is not necessarily an especially important source of syncretism, Pāṇini notwithstanding. I will also argue that Impoverishment could be the answer in cases where previous analyses have appealed to brute-force VI ordering and/or negative feature specifications, as argued by Nevins (2003). Finally, I will argue that metasyncretism could be a good diagnostic indicator for when it's worth undertaking investigation of more "deep" syntactic explanations for particular morphological effects. In other words, the surface phenomenon of metasyncretism may tell linguists when to look for featurally conditioned effects in the syntactic derivation.

9.2 Background: metasyncretism and impoverishment

As noted above, Williams (1994) identified metasyncretism as a phenomenon to be accounted for. Williams illustrated the concept with a subset of the Latin nominal declension endings. His example is provided in (3) below: the various case/number paradigms of Latin's five nominal classes.[2]

[1] Bobaljik also showed that UG does not impose an Instantiated Basic Paradigm requirement, as predicted/entailed by more restrictive DM-style theories but not by paradigm-based theories.

[2] Although I freely use the term "paradigm" in this paper to refer to nicely laid-out collections of functional affixes, I do not intend to endorse an independent status in the grammar for them. With Bobaljik, Frampton, and other DM theorists, I subscribe to the notion that the paradigm is an epiphenomenon—a notationally convenient way to present the affixes that are eligible to realize any given type of syntactic terminal node, defined by the features that are active in that terminal node.

(3) **Class I case desinences**

Case	Singular	Plural
Nominative	*-a*	*-ae*
Accusative	*-am*	*-as*
Dative	*-ae*	*-is*
Ablative	*-a*	

Class II case desinences

Case	Singular	Plural
Nominative	*-us*	*-i*
Accusative	*-um*	*-os*
Dative	*-o*	*-is*
Ablative		

Class III case desinences

Case	Singular	Plural
Nominative	(var)	*-es*
Accusative	*-em*	*-es/is*
Dative	*-i*	*-ibus*
Ablative	*-e*	

Class IV case desinences

Case	Singular	Plural
Nominative	*-us*	*-us*
Accusative	*-um*	
Dative	*-ui*	*-ibus*
Ablative	*-u*	

Class V case desinences

Case	Singular	Plural
Nominative	*-es*	*-es*
Accusative	*-em*	
Dative	*-ei*	*-ebus*
Ablative	*-e*	

Williams's point is that dative and ablative case *always* syncretize in the plural, regardless of what the actual suffix is.[3] This is a metaparadigm—a generalization over the shape of a given type of paradigm within a language, which holds regardless of the particular forms in any particular instantiation of that paradigm type. A syncretism that holds in a metaparadigm is a *metasyncretism*—again, it's a syncretism that holds for a particular set of features in a language, regardless of the particular affixes used in any particular instance of the syncretism. The plural ablative/dative syncretism in Latin case endings is thus apparently a metasyncretism.

Bobaljik (2001) provides a Russian example of the same phenomenon, also a subset of the case/number paradigms of pronominal and nominal suffixes:

(4) **Third person nominative pronouns**

Gender	Singular	Plural
Masculine	*on-Ø*	
Feminine	*on-a*	*on-i*
Neuter	*on-o*	

Third person dative pronouns

Gender	Singular	Plural
Masculine	*emu*	
Feminine	*ej*	*im*
Neuter	*emu*	

[3] Ironically, when you include the genitive and vocative forms, Latin actually makes a case *against* Williams's Instantiated Basic Paradigm proposal from the same paper, a case that is essentially identical to Bobaljik's argument against IBPs from Russian.

Nominative adjective suffixes

Gender	Singular	Plural
Masculine	*-yi*	*-ye*
Feminine	*-aja*	
Neuter	*-oe*	

Here, the metasyncretism is also in the plural: the different genders are always syncretized away in the plural, again no matter what the particular suffix realizing the syncretism is. In the nominative pronouns, the plural, gender-syncretizing suffix is *-i*, in the dative pronouns it's *-im*, and in nominative adjectives it's *-ye*—but the pattern of having only a single suffix for each gender in Russian plural holds throughout.

To show how a standard underspecification analysis fails to capture this generalization, Bobaljik presents the DM analysis of Halle (1997) for the nominative and dative pronouns. The vocabulary items which instantiate this analysis are given in (5) below. The phonological form of the suffix is given on the left; the features which condition the insertion of that suffix to realize a terminal node are on the right.

(5) a. /-i/ ⇔ [plural]
   b. /-a/ ⇔ [feminine]
   c. /-o/ ⇔ [neuter]
   d. -Ø ⇔ elsewhere

On Halle's analysis, these vocabulary items will compete *in this order*, to realize pronominal terminal nodes specified with [+nominative], [+3] features. That is, any time the syntax sends out a terminal node for a pronoun with [+3 +nominative], these vocabulary items will line up in this order to get in and realize that terminal node. The first VI which is found to be compatible with the features of the terminal node will win the competition to realize that terminal node, and the other VIs are blocked from appearing in that form. (Note that there is an ordering problem here. Since none of the VIs are specified for more than a single feature, the ordering cannot be accomplished via the "most-specific-item-first" principle. Halle resolves this by just imposing a brute-force order; other solutions involving various notions of markedness-dependent ordering are also possible, see Noyer (1992) and Harley (1994). See below, and Nevins this volume for further discussion.)

Given these VI items, syncretism in the plural for nominative pronouns falls out because the [+plural] vocabulary item *-i* (a) is underspecified for gender and (b) is crucially ordered before the other three affixes. Hence, any time the terminal node contains a [+plural] feature, the *-i* suffix will jump in and realize the terminal node, thus blocking any of the gender-distinguishing suffixes from being inserted.

To see how this works, imagine the syntax has constructed a tree with a third person feminine subject argument, hence containing a fully specified syntactic terminal node with features [+3 +nominative +plural +feminine]. Both the *-i* and *-a* vocabulary items in the list in (5) are eligible to realize this node, but because *-i* is ordered before *-a*, it will block *-a* from appearing. It is the underspecification of the plural VI *-i* that creates the gender syncretism in the plural.

On this analysis, the syncretism in the nominative adjectival endings will fall out because the nominative-adjective agreement VIs have exactly the same feature specifications, and are ordered in exactly the same way, as the pronominal VIs. That is, the VIs competing to realize a terminal node for agreement on a nominative adjective are as in (6) below:

(6) a. /-ye/ ⇔ [plural]
  b. /-aja/ ⇔ [feminine]
  c. /-oe/ ⇔ [neuter]
  d. /-yi/ ⇔ elsewhere

Here the syncretism will fall out for the same reason given above. This raises the question of *why* all the VIs for [plural] are underspecified for gender. That is, on this analysis there is *no principled reason* why the completely different set of vocabulary items for the nominative adjectival suffixes should not happen to contain a suffix specific to feminine plural forms, and perhaps also a different one for neuter forms. That is, there is no reason why, in such a theory, Russian plural paradigms should *always* syncretize gender. Underspecification can predict syncretism created by a single VI's features—but when the syncretism cuts across different VIs, underspecification becomes a description, not an explanation, of the pattern. On an underspecification analysis, the widespread syncretism in the plural is an accident of the particular VI inventory of Russian, not a deep property of Russian grammar. This is the metasyncretism problem.[4]

[4] On closer examination, the Latin case might be a more trivial example of metasyncretism than the Russian case. The endings given could be decomposable into a declension-conditioned vowel followed by a case/number suffix; if this is the right analysis of the Latin suffixes, metasyncretism in

One main point of Bobaljik's argument is that Impoverishment is an already-existing tool within DM that allows the theory to capture metasyncretisms like this one. Impoverishment rules are language-specific rules that manipulate terminal nodes as they come out of the syntax by deleting certain features ("impoverishing" the terminal bundle) in the environment of other features. One could think of Impoverishment as a mechanism whose function is to reduce the complexity of forms reaching the PF interface.

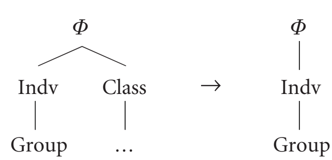
To capture the Russian metasyncretism, for example, one only has to posit a single feature-deleting Impoverishment rule. This rule will apply to all syntactic feature bundles before VI insertion even occurs. The particular Impoverishment rule active in Russian could be represented like this:

(7) [+plural +{masculine, feminine, neuter}] → [+plural]

In (7), a feature bundle in the syntax containing both a plural number feature and any gender feature is reduced to a bundle with no gender feature by Impoverishment—the gender feature is deleted from the structure. If this rule applies to all Russian feature bundles that match its structural description before spellout, there just never *are* any gender features present in the plural at all by the time vocabulary items are inserted, and hence no plural VI could ever be conditioned by them. Further, no *singular* gender-specific VI could ever be in competition for a plural node—it would not be in the competition because it would not match a subset of the features of such a node.[5] That is, Impoverishing the Russian feature bundle in this way means that in fact, in this

the dative/ablative only arises between two subsets of the five declensions: I & II (-s) vs III, IV, & V (*-bus*). The syncretic coincidence, here, then, is somewhat less compelling than the Russian three-way case. As we will repeat again below, it's crucially the fact that the *same* syncretism arises with *different* VIs that makes for a missed generalization; the more such VIs in the language, the more surprising the coincidence.

[5] Because of the issue represented by the curly brackets in the Impoverishment rule in (7), Harley (1994) argues that morphosyntactic features must be organized geometrically, allowing reference to *types* of features, rather than just to individual features, as in feature-bundle notation. In a feature-geometric representation, Impoverishment can be treated as delinking of a subtree of the geometry. For example, the rule in (7) could be represented as in (i) below, in Harley and Ritter's (2002) feature geometry; any bundle containing both a Group (plural) node and a Class node (organizing node for gender) will have its Class node (and anything dominated by Class) delinked from the geometry. For further discussion of Impoverishment as a delinking operation, see Harley 1994 and Nevins 2003.



subset of the forms, there's just one form for every distinct feature bundle—there is no underspecification of VIs at all. Of course, this also removes the competition-ordering problem noted above—since no VI is compatible with the bundles realized by any other VI, there will be no competition for appearing in the slot, and no problem of ordering the VIs with the winning candidate first arises.

Morphological Impoverishment, then, is one solution to this problem. Another hypothesis is possible however: one could suppose that there just are no feature bundles that contain plural and gender *in the numeration*—that is, it's a deep fact about the syntax of Russian that gender features are not present in plural bundles. The metasyncretism facts would turn out the same in the end.

Metasyncretic patterns, then, are a clue that something is going on before VI insertion take place, whether it is purely morphological (Impoverishment) or deeply syntactic (Numeration bundling restrictions).

9.3 A case study: English pronouns, impoverishment, and ordering problems

English pronouns show contrasts in first, second, and third person, in singular and plural, in masculine, feminine, and neuter, and in three cases: nominative, genitive, and accusative (or Other). I will assume two-feature systems for distinguishing person, gender, and case and a one-feature system for number. I assume the features are organized into geometries, but this doesn't impact the analysis here so I will treat them as entirely independent of each other, and illustrate them in bundles.

(8) Active features of English Pronouns, Present in the φ-Feature Bundles in Syntax

Person	[±speaker]	*I* vs *you*
	[±participant]	*you* vs *he*
Number	[±group]	*he* vs *them*
Gender	[±feminine]	*he* vs *she*
	[±neuter]	*he* vs *it*
Case	[±superior]	*I* vs *me*
	[±oblique]	*me* vs *my*

The [±superior], [±oblique] features for Case are taken from Halle (1997); they combine to produce the familiar cases in the following way:

(9) [+superior −oblique] = Nominative
[−superior +oblique] = Genitive
[−superior −oblique] = "Accusative" (= default case)

(Case features are used to capture the syncretism of the pronoun between genitive and accusative.) Assuming free bundling in the Numeration, constrained by entailment relations (no [+speaker −participant] nodes, for example)[6], these seven binary features will combine freely yielding, if we rule out the three contradictory specifications [+speaker −participant], [+feminine −neuter], and [+superior −oblique], the fifty-four ($3^3 \times 2$) possible fully specified English pronominal nodes illustrated in Table 9.1. The syncretisms in the actual realization of these nodes are represented by the dotted lines between syncretic cells, and the form which realizes each set of nodes is set above it in bold. Obviously there is a great deal of syncretism in the system, including the typical Indo-European loss of gender distinctions in the plural, as we have seen for Russian above.

Let us first attempt a straightforward analysis, without any Impoverishment, and only referring to marked (positive) feature values in our VI entries, using VI underspecification and competition to capture the syncretisms in the system.[7] One set of VIs that could capture the desired English pronoun syncretisms using underspecification is below.[8]

(10) a. /wij/ $\Leftrightarrow \begin{bmatrix} \mathrm{D_{RE}} \\ \text{+speaker +group +superior} \end{bmatrix}$

b. /awɹ/ $\Leftrightarrow \begin{bmatrix} \mathrm{D_{RE}} \\ \text{+speaker +group +oblique} \end{bmatrix}$

[6] This is one of the motivations for feature geometric representation: dependency in the tree can encode entailment relations.

[7] Terminal nodes in syntax are fully specified by the end of Morphology.

[8] I have not included a VI for the genitive third person neuter singular DP, realized as *its*, which I assume is a complex form made up of *it* and *-s*, the same *-s* that appears on full DPs in genitive positions in the syntax. If *its* is morphologically complex, it must also be syntactically complex. The question is whether or not the *-s* realizes a separate Case terminal node, which just in the 3SG.N fails to fuse with the pronominal head to create a case-ful feature bundle, or whether the *-s* is not a case suffix itself but the realization of the genitive case-assigning *head*, presumably possessive D^0. I will assume the latter approach. The form *it*, then, realizes a 3SG.N node which is indeed fully specified for [–superior +oblique]; the *-s* suffix realizes the D^0 node which inserts or checks those features on the pronominal bundle in its specifier. The puzzle, then, is why no *-s* suffix shows up with the other genitive pronouns. Why do we not get *hers book*, for example? I assume a competing null VI realizes the possessive D^0 node in these cases, conditioned by the presence of a nonneuter pronominal in its specifier and a lexically realized NP in its complement. This null VI blocks the insertion of the elsewhere *-s* VI in that context. When the lexically realized DP is absent, of course, the context for insertion of the null D^0 VI is removed and the *-s* resurfaces: That book is *her-s*. (The *-n* in *mine* would need to be accounted for with another, contextually conditioned VI for the D^0 node.)

TABLE 9.1 Possible pronominal D^0 terminal nodes of English

		singular			plural		
		masculine	feminine	neuter	masculine	feminine	neuter
1	Nom	**I**			**WE**		
		+spkr **+part** –group –fem –neut **+sup** – obl	**+spkr** **+part** – group **+fem** – neut **+sup** – obl	**+spkr** **+part** – group –fem **+neut** **+sup** –obl	+ spkr **+part** **+group** –fem –neut **+sup** –obl	+ spkr **+part** **+group** **+fem** – neut **+sup** – obl	+ spkr **+part** **+group** – fem **+neut** **+sup** –obl
	Acc	**ME**			**US**		
		+spkr **+part** –group –fem –neut –sup –obl	**+spkr** **+part** –group **+fem** –neut –sup –obl	**+spkr** **+part** –group –fem **+neut** –sup –obl	+ spkr **+part** **+group** –fem –neut –sup –obl	+ spkr **+part** **+group** **+fem** –neut –sup –obl	+ spkr **+part** **+group** –fem **+neut** –sup –obl
	Gen	**MY**			**OUR**		
		+spkr **+part** –group –fem –neut –sup **+obl**	**+spkr** **+part** –group **+fem** –neut –sup **+obl**	**+spkr** **+part** –group –fem **+neut** –sup **+obl**	**+ spkr** **+part** **+group** –fem –neut –sup **+obl**	**+ spkr** **+part** **+group** **+fem** –neut –sup **+obl**	**+ spkr** **+part** **+group** –fem **+neut** –sup **+obl**
2	Nom	**YOU**					
		–spkr **+part** –group –fem –neut **+sup** –obl	–spkr **+part** –group **+fem** –neut **+sup** –obl	–spkr **+part** –group –fem **+neut** **+sup** –obl	–spkr **+part** **+group** –fem –neut **+sup** –obl	–spkr **+part** **+group** **+fem** –neut **+sup** –obl	–spkr **+part** **+group** –fem **+neut** **+sup** –obl
	Acc	–spkr **+part** –group –fem –neut –sup –obl	–spkr **+part** –group **+fem** –neut –sup –obl	–spkr **+part** –group –fem **+neut** –sup –obl	–spkr **+part** **+group** –fem –neut –sup –obl	–spkr **+part** **+group** **+fem** –neut –sup –obl	–spkr **+part** **+group** –fem **+neut** –sup –obl
	Gen	**YOUR**					
		–spkr **+part** –group –fem –neut –sup **+obl**	–spkr **+part** –group **+fem** –neut –sup **+obl**	–spkr **+part** –group –fem **+neut** –sup **+obl**	–spkr **+part** **+group** –fem –neut –sup **+obl**	–spkr **+part** **+gr oup** **+fem** –neut –sup **+obl**	–spkr **+part** **+group** –fem **+neut** –sup **+obl**
3	Nom	**HE**	**SHE**	**IT**	**THEY**		
		–spkr –part –group –fem –neut **+sup** –obl	–spkr –part –group **+fem** –neut **+sup** –obl	–spkr –Part –group –fem **+neut** **+sup** –obl	–spkr –part **+group** –fem –neut **+sup** –obl	–spkr –part **+group** **+fem** –neut **+sup** –obl	–spkr –part **+group** –fem **+neut** **+sup** – obl
	Acc	**HIM**	**HER**		**THEM**		
		–spkr –part –group –fem –neut –sup –obl	–spkr –part –group **+fem** –neut –sup –obl	–spkr –part –group –fem **+neut** –sup –obl	–spkr –part **+group** –fem –neut –sup –obl	–spkr –part **+group** **+fem** –neut –sup –obl	–spkr –part **+group** –fem **+neut** –sup –obl
	Gen	**HIS**		**ITS**	**THEIR**		
		–spkr –Part –group –fem –neut –sup **+obl**	–spkr –part –group **+fem** –neut –sup **+obl**	–spkr –part –group –fem **+neut** –sup **+obl**	–spkr –part **+group** –fem –neut –sup **+obl**	–spkr –part **+group** **+fem** –neut –sup **+obl**	–spkr –part **+group** –fem **+neut** –sup **+obl**

c. /ʌs/ ⇔ $\begin{bmatrix} \mathrm{D}_{\text{RE}} \\ +\text{speaker} + \text{group} \end{bmatrix}$

d. /aj/ ⇔ $\begin{bmatrix} \mathrm{D}_{\text{RE}} \\ +\text{speaker} + \text{superior} \end{bmatrix}$

e. /maj/ ⇔ $\begin{bmatrix} \mathrm{D}_{\text{RE}} \\ +\text{speaker} + \text{oblique} \end{bmatrix}$

f. /mij/ ⇔ $\begin{bmatrix} D_{RE} \\ \text{+speaker} \end{bmatrix}$

g. /jɔɹ/ ⇔ $\begin{bmatrix} D_{RE} \\ \text{+participant +oblique} \end{bmatrix}$

h. /juw/ ⇔ $\begin{bmatrix} D_{RE} \\ \text{+participant} \end{bmatrix}$

i. /ðej/ ⇔ $\begin{bmatrix} D_{RE} \\ \text{+group +superior} \end{bmatrix}$

j. /ðɛɹ/ ⇔ $\begin{bmatrix} D_{RE} \\ \text{+group +oblique} \end{bmatrix}$

k. /ðɛm/ ⇔ $\begin{bmatrix} D_{RE} \\ \text{+group} \end{bmatrix}$

l. /ɪt/ ⇔ $\begin{bmatrix} D_{RE} \\ \text{+neuter} \end{bmatrix}$

m. /ʃij/ ⇔ $\begin{bmatrix} D_{RE} \\ \text{+feminine +superior} \end{bmatrix}$

n. /hɚ/ ⇔ $\begin{bmatrix} D_{RE} \\ \text{+feminine} \end{bmatrix}$

o. /hij/ ⇔ $\begin{bmatrix} D_{RE} \\ \text{+superior} \end{bmatrix}$

p. /hɪz/ ⇔ $\begin{bmatrix} D_{RE} \\ \text{+oblique} \end{bmatrix}$

q. /hɪm/ ⇔ $[D_{RE}]$ Elsewhere

What's crucial in any such analysis is to (a) specify the vocabulary items for all and only the features they are sensitive to, and (b) get the order of competition of the vocabulary items right, so that the correct patterns of syncretism fall out via blocking. If one doesn't want to resort to "brute-force" ordering, as in Halle's analysis of Russian above, extrinsic principles must be appealed to which will cause the correct order to fall out. Normally, the relevant independent principle is the "Elsewhere" principle: the order of competition is determined by the degree of feature specification of individual VIs. This principle is given in (11) below.

(11) The Elsewhere ("Pāṇinian") Principle

Vocabulary items which realize *more* of the features in a given terminal node are automatically ordered before vocabulary items which realize *fewer* of the node's features.

Of course, the VIs that are being ordered by the Elsewhere Principle are themselves a limited subset of the available ones—only VIs whose features are *compatible* with the terminal node being realized are in the competition in the first place. This is determined by the Subset Principle, stated in (12) below:[9]

(12) THE SUBSET PRINCIPLE
Only vocabulary items whose specified features are a subset of the features in a given terminal node are able to compete to discharge the position-of-exponence of that terminal node.

So, for example, faced with a 1PL.FEM.NOM node, containing the features listed in (13) below, the particular vocabulary items from (10) that satisfy the Subset Principle and are hence competing to be inserted into that node are those listed in (14). In particular, none of the VIs in (10) that are specified for [+oblique] or [+neuter] will be competing.

(13) Terminal node: $\begin{array}{c} \mathrm{D}^0 \\ \begin{bmatrix} \text{+speaker} & \text{+participant} \\ \text{+group} & \\ \text{+feminine} & -\text{neuter} \\ \text{+superior} & -\text{oblique} \end{bmatrix} \end{array}$

(14) a. /wij/ $\Leftrightarrow \begin{bmatrix} \mathrm{D}_{\mathrm{RE}} \\ \text{+speaker +group +superior} \end{bmatrix}$

c. /ʌs/ $\Leftrightarrow \begin{bmatrix} \mathrm{D}_{\mathrm{RE}} \\ \text{+speaker +group} \end{bmatrix}$

d. /aj/ $\Leftrightarrow \begin{bmatrix} \mathrm{D}_{\mathrm{RE}} \\ \text{+speaker +superior} \end{bmatrix}$

[9] The Elsewhere Principle is often presented as a subcase of the Subset Principle, as in Halle (1997). I have separated the two here, however, to emphasize that this version of the Elsewhere Principle is distinct from that presented in Kiparsky's original formulation (1973). Kiparsky's Elsewhere Principle ordered rules based on their subset properties *with respect to each other*. For instance, in the list of VIs in (14), the ordering of VI (a) /wij/ with respect to VI (c) /ʌs/ could be established by Kiparsky's Subset version of the Elsewhere Principle, since /ʌs/ refers to a subset of the features referred to by /wij/. However, Kiparsky's Elsewhere principle would have nothing to say about the ordering of VI (c) /ʌs/ and VI (h) /juw/, however, since /juw/ does not mention a subset of the features mentioned by /ʌs/. If we understand the Elsewhere Principle as determining order based on the sheer numbers of features involved in a pair of competing VIs, however, independently of the subset/superset properties of those feature sets with respect to each other, the ordering of /ʌs/ before /juw/ can be established. Similarly the respective ordering of (c) /ʌs/ and (d) /aj/ cannot be established by the Subset Principle, since their respective feature sets intersect, rather than forming a superset/subset relation. (The feature-counting version of the Elsewhere Principle will not help here either, of course, since they refer to the same number of features; see below for discussion of such cases.)

f. /mij/ ⇔ $\begin{bmatrix} \text{D}_{\text{RE}} \\ \text{+speaker} \end{bmatrix}$

h. /juw/ ⇔ $\begin{bmatrix} \text{D}_{\text{RE}} \\ \text{+participant} \end{bmatrix}$

i. /ðej/ ⇔ $\begin{bmatrix} \text{D}_{\text{RE}} \\ \text{+group +superior} \end{bmatrix}$

k. /ðɛm/ ⇔ $\begin{bmatrix} \text{D}_{\text{RE}} \\ \text{+group} \end{bmatrix}$

m. /ʃij/ ⇔ $\begin{bmatrix} \text{D}_{\text{RE}} \\ \text{+feminine +superior} \end{bmatrix}$

n. /hɚ/ ⇔ $\begin{bmatrix} \text{D}_{\text{RE}} \\ \text{+feminine} \end{bmatrix}$

o. /hij/ ⇔ $\begin{bmatrix} \text{D}_{\text{RE}} \\ \text{+superior} \end{bmatrix}$

q. /hɪm/ ⇔ $[\text{D}_{\text{RE}}]$

This particular competition illustrates the Elsewhere Principle in action: the winning VI, /wij/, is specified for three features, more than any other eligible VI, and so it is the "best" realization of that terminal node—this VI is therefore ordered first in the list, and wins the competition.

We can see underspecification syncretism will arise in 1PL nodes generally, given these VIs. In the example here, the VI /wij/ will also win the competition for a 1PL.MASC.NOM terminal node, as illustrated in (15) below. In this case, /wij/ is competing against a smaller subset of the pronominal VIs, represented in (16), since the VIs specified for [+feminine] will not be in the competition. Since /wij/ is also specified for the most features in this competition, it will also win this competition. That is, there will be syncretism between 1PL.FEM.NOM terminal nodes and 1PL.MASC.NOM terminal nodes. The syncretism will arise because /wij/ is underspecified for gender features.

(15) Terminal node: D^0

$$\begin{bmatrix} \text{+speaker +participant} \\ \text{+group} \\ -\text{feminine} \ -\text{neuter} \\ \text{+superior} \ -\text{oblique} \end{bmatrix}$$

(16) a. /wij/ ⇔ $\begin{bmatrix} \text{D}_{\text{RE}} \\ \text{+speaker +group +superior} \end{bmatrix}$

c. /ʌs/ ⇔ $\begin{bmatrix} \mathrm{D_{RE}} \\ \text{+speaker +group} \end{bmatrix}$

d. /aj/ ⇔ $\begin{bmatrix} \mathrm{D_{RE}} \\ \text{+speaker +superior} \end{bmatrix}$

f. /mij/ ⇔ $\begin{bmatrix} \mathrm{D_{RE}} \\ \text{+speaker} \end{bmatrix}$

h. /juw/ ⇔ $\begin{bmatrix} \mathrm{D_{RE}} \\ \text{+participant} \end{bmatrix}$

i. /ðej/ ⇔ $\begin{bmatrix} \mathrm{D_{RE}} \\ \text{+group +superior} \end{bmatrix}$

k. /ðϵm/ ⇔ $\begin{bmatrix} \mathrm{D_{RE}} \\ \text{+group} \end{bmatrix}$

o. /hij/ ⇔ $\begin{bmatrix} \mathrm{D_{RE}} \\ \text{+superior} \end{bmatrix}$

q. /hɪm/ ⇔ $[\mathrm{D_{RE}}]$

In the case of /wij/, then, the combination of the Subset Principle, the Elsewhere Principle, and the underspecification of the VI will work together perfectly to generate the syncretism of /wij/ across all 1PL.NOM nodes, no matter the gender. Sometimes, however, one faces a case where the Elsewhere Principle doesn't obviously provide an unambiguous ordering, as in the next case under consideration. Only the vocabulary items in (18) are in competition to realize the 1SG.FEM.NOM terminal node in (17), in accordance with the Subset Principle:

(17) Terminal node: $\mathrm{D^0}$ $\begin{bmatrix} \text{+speaker +participant} \\ \text{−group} \\ \text{+feminine −neuter} \\ \text{+superior −oblique} \end{bmatrix}$

(18) d. /aj/ ⇔ $\begin{bmatrix} \mathrm{D_{RE}} \\ \text{+speaker +superior} \end{bmatrix}$

f. /mij/ ⇔ $\begin{bmatrix} \mathrm{D_{RE}} \\ \text{+speaker} \end{bmatrix}$

h. /juw/ ⇔ $\begin{bmatrix} \mathrm{D_{RE}} \\ \text{+participant} \end{bmatrix}$

m. /ʃij/ ⇔ $\begin{bmatrix} \text{D}_{\text{RE}} \\ \text{+feminine +superior} \end{bmatrix}$

n. /hr/ ⇔ $\begin{bmatrix} \text{D}_{\text{RE}} \\ \text{+feminine} \end{bmatrix}$

o. /hij/ ⇔ $\begin{bmatrix} \text{D}_{\text{RE}} \\ \text{+superior} \end{bmatrix}$

q. /hɪm/ ⇔ $[\text{D}_{\text{RE}}]$

In this competition, the Elsewhere Principle will correctly eliminate all the VIs that only realize a single feature, or no feature, namely (18f, h, n, o, and q), will be eliminated, but there are two VIs for which a simple feature-counting metric cannot obviously decide: (18d,m). The terminal node and the two candidates which the Elsewhere Principle cannot order are repeated in (19) and (20) below:

(19) Terminal node: $\begin{matrix} \text{D}^0 \\ \begin{bmatrix} \text{+speaker +participant} \\ -\text{group} \\ \text{+feminine} -\text{neuter} \\ \text{+superior} -\text{oblique} \end{bmatrix} \end{matrix}$

(20) d. /aj/ ⇔ $\begin{bmatrix} \text{D}_{\text{RE}} \\ \text{+speaker +superior} \end{bmatrix}$

m. /ʃij/ ⇔ $\begin{bmatrix} \text{D}_{\text{RE}} \\ \text{+feminine +superior} \end{bmatrix}$

Of course, the VI (20d) is the correct result—we want it to win the competition with (m), but they both realize two features, so the Elsewhere Principle won't help us to order them.[10]

One solution often invoked in cases like these is some version of a feature hierarchy like that proposed in Noyer (1992), according to which certain features are intrinsically more marked than other features. The VIs /aj/ and /ʃij/ are specified for the same case feature, but for /aj/ the other feature is a person feature, [+speaker], while for /ʃij/ the second feature is a gender feature, [+feminine]. According to Noyer's feature hierarchy, Person > Number > Gender, so two VIs which are equivalent in terms of the Elsewhere Principle will compete in the order determined by the feature hierarchy. We could then

[10] Explicitly using the feature geometry of Harley and Ritter (2002) to evaluate markedness as in Harley (1994) won't help us here either—the geometry that minimally represents (d) uses 4 nodes, while the one that minimally represents m uses 5—if the more marked compatible geometry wins, then (m) will beat (d) here.

use the feature hierarchy to correctly order /aj/ before /ʃij/, since person is higher on the hierarchy than gender, and then /aj/ will win the competition, and block /ʃij/ from realizing this terminal node.

The correct ordering could thus be adequately determined in the case of 1SG.NOM nodes, above, but in other cases, things are not so easy. Sometimes the Elsewhere Principle gives us the wrong result entirely, eliminating the correct candidate from competition before the feature hierarchy can even begin to operate. So, for instance, consider the competition to realize a 2PL.FEM.NOM terminal node represented in (21). The vocabulary items in (22) will be in competition to realize this node, according to the Subset Principle.

(21) Terminal node: D^0

$$\begin{bmatrix} -\text{speaker } +\text{participant} \\ +\text{group} \\ +\text{feminine } -\text{neuter} \\ +\text{superior } -\text{oblique} \end{bmatrix}$$

(22) h. /juw/ $\Leftrightarrow \begin{bmatrix} D_{RE} \\ +\text{participant} \end{bmatrix}$

i. /ðej/ $\Leftrightarrow \begin{bmatrix} D_{RE} \\ +\text{group } +\text{superior} \end{bmatrix}$

k. /ðɛm/ $\Leftrightarrow \begin{bmatrix} D_{RE} \\ +\text{group} \end{bmatrix}$

m. /ʃij/ $\Leftrightarrow \begin{bmatrix} D_{RE} \\ +\text{feminine } +\text{superior} \end{bmatrix}$

n. /hɚ/ $\Leftrightarrow \begin{bmatrix} D_{RE} \\ +\text{feminine} \end{bmatrix}$

o. /hij/ $\Leftrightarrow \begin{bmatrix} D_{RE} \\ +\text{superior} \end{bmatrix}$

q. /hɪm/ $\Leftrightarrow [D_{RE}]$

This competition has a major problem. We want (h) to win (because 2PL.FEM.NOM in English is /juw/, but the Elsewhere Principle will rank *both* (i) and (m) above (h), because they both realize two of the matching features, rather than just one. The VI /ðej/ in (i) will rank above /ʃij/ in (m), according to the feature hierarchy, because number outranks gender. Consequently, using just the Elsewhere Principle and the feature hierarchy to determine order, the analysis predicts that a 2PL.FEM.NOM pronoun in English ought to be realized as “they”.

One of the possible solutions would be to invoke brute force ranking of VIs, as Halle did for Russian, according to which /juw/ is simply stipulated to outrank the other competitors in the hunt. Alternatively, one could tinker with the features invoked by the theory—we could give up the idea that third person is unmarked in English VIs. We could include negative values [−speaker −participant] in the third person VIs, as Frampton (2002) argues, or invent a feature [+3] that refers to third person specifically (cf. Trommer, this volume), and include that feature in the third person VIs. Extant DM analyses have done either or both of these in such situations. It's certainly rewarding to tinker with the features until the correct ordering of VIs emerges "naturally", from just the Elsewhere Principle and/or the feature hierarchy. However, there's no agreement among theorists on what's the best kind of solution: negative values, new features, brute force—and all such solutions are somewhat aesthetically unappealing.

Although not widely deployed in this situation, Impoverishment, or restrictions on Numeration bundles, could be another kind of solution to ordering problems like this. Such solutions would remove problematic VIs from the competition entirely, via the Subset Principle. With Impoverishment, feature deletion in the terminal node will mean that fewer VIs will have a subset of the terminal node's features, and hence fewer VIs will be eligible to compete; with Numeration bundling restrictions, the problematic features would simply never be present in the syntactic derivation at all.

So really, there's an embarrassment of possible solutions to this kind of problem in DM: feature hierarchies, different or negative features, brute force on the one hand—all applying to vocabulary items—and Impoverishment or Numeration feature bundling on the other, applying to the pre-insertion terminal nodes.

Here, I want to suggest that the latter solution is often to be preferred, especially when metasyncretisms can be observed in the paradigms.[11] The remarkable thing about the metasyncretism cases is that an Impoverishment solution turns out to be needed to capture the metasyncretism patterns in many cases where a simple underspecification analysis is in principle possible (as for Russian), and where it had not occurred to anyone before to tinker with the feature bundles via Impoverishment or Numeration restrictions.

[11] Nevins (2003) argues, along these lines, that judicious use of Impoverishment will allow the elimination of references to negative feature values from DM analyses, showing how this works for the thorny Germanic 1/3SG syncretism. To make this work, however, Nevins has to assume that Minimal (singular) is a marked, rather than underspecified feature in English. Depending on the approach to underspecification that turns out to be right, this may or may not work. Here I've treated singular as unmarked.

Metasyncretism is a relatively new application of Impoverishment, however. Before we go on to show how metasyncretism-motivated Impoverishment can help with the problematic English case above, let us consider the phenomena which originally motivated the postulation of the Impoverishment operation in the first place.

9.4 Motivating Impoverishment independently of metasyncretism

The Impoverishment operation was originally proposed to account for cases where an otherwise regular VI mysteriously failed to appear in an environment where the analysis predicted it would show up. Impoverishing the crucial feature from the relevant feature bundles removed the problematic VI from competition, and hence predicted its absence (Bonet 1991). One clear case is afforded by the case inflection of Baoan[12] nouns and pronouns, shown in Table 9.2 (data from the Surrey report).

Here we have a beautifully agglutinative paradigm, with some case- and number-conditioned suppletion in the personal pronoun stems, but utterly transparent case suffixes in both the nominal and personal pronominal paradigms.[13] Factoring out the stems, the case suffix paradigms are given in Table 9.3.

The problem arises in that it seems clear that the genitive suffix is *-ne*, and the dative suffix is *-de*, in both the nominal and pronominal paradigms, but the accusative case syncretizes with the genitive in the nominal paradigm and the dative in the pronominal paradigm. Metasyncretism is not an issue with these case morphemes, because the same VIs are at stake in all the relevant cells of both paradigms.

Underspecification will never do the job here. If one underspecifies the genitive VI *-ne* to get it to spread into the accusative in the nominal paradigm, then we can't understand why dative *-de* (which also occurs in the nominal paradigm) spreads into the accusative in the pronouns, and vice versa. There is no underspecification solution for this problem.

One could assume it's a Numeration bundling phenomenon in the language: first and second person object pronouns bundle, exceptionally, only with dative case features (like Spanish animates, for example)[14] and cannot cooccur with accusative case features. In that case, it would be a deep syntactic

[12] A Mongolian language of Gansu province, China.

[13] Baoan is another language where there's no Instantiated Basic Paradigm in the sense of Williams (1994); the crossing syncretisms of accusative/genitive and accusative/dative mean no column of forms makes every distinction present in the language.

[14] Thanks to David Pesetsky for pointing out this possibility.

Table 9.2 Baoan case forms for nouns and personal pronouns

<table>
<tr><th></th><th colspan="2">Noun: “bird”</th><th colspan="2">1st person pronouns</th><th colspan="2">2nd person pronouns</th></tr>
<tr><th></th><th>Singular</th><th>Plural</th><th>Singular</th><th>Plural</th><th>Singular</th><th>Plural</th></tr>
<tr><td>Nominative</td><td>bendžer</td><td>bendžerle</td><td>be</td><td>mange/bede</td><td>če</td><td>ta</td></tr>
<tr><td>Genitive</td><td rowspan="2">bendžerne</td><td rowspan="2">bendžerlene</td><td>mene</td><td>mane/bedane</td><td>čene</td><td>tane</td></tr>
<tr><td>Accusative</td><td rowspan="2">na:de</td><td rowspan="2">mande/bedande</td><td rowspan="2">čo:de</td><td rowspan="2">tade</td></tr>
<tr><td>Dative/Locative</td><td>bendžerde</td><td>bendžerlede</td></tr>
<tr><td>Ablative</td><td>bendžerse</td><td>bendžerlese</td><td>na:se/bese</td><td>manse/bedanse</td><td>čo:se</td><td>tase</td></tr>
<tr><td>Instrumental/Comitative</td><td>bendžerɢale</td><td>bendžerleɢale</td><td>beɢale</td><td>mangeɢale/bedaɢale</td><td>čeɢale</td><td>taɢale</td></tr>
</table>

TABLE 9.3 Baoan case suffixes

<table>
<tr><th></th><th>Noun</th><th>Pronoun</th></tr>
<tr><td>Nominative</td><td>Ø</td><td>Ø</td></tr>
<tr><td>Genitive</td><td rowspan="2">ne</td><td>ne</td></tr>
<tr><td>Accusative</td><td rowspan="2">de</td></tr>
<tr><td>Dative/locative</td><td>de</td></tr>
<tr><td>Ablative</td><td>se</td><td>se</td></tr>
<tr><td>Instrumental/comitative</td><td>ɢale</td><td>ɢale</td></tr>
</table>

fact about Baoan, which one would expect to see have effects in the narrow syntax—perhaps first and second person objects would not passivize, for example.

Alternatively, an Impoverishment rule could apply to certain case bundles to create the syncretism. An analysis exploiting this option is presented next.

Assume that accusative shares a marked case feature with either the dative or the genitive. This feature will trigger case syncretism in one paradigm, because a marked VI will refer to it, and win insertion in both the accusative node and the other case with the same marked feature. In the other paradigm, that feature is deleted in the accusative via a conditioned Impoverishment rule, and consequently the marked VI will drop out of competition. The accusative will then syncretize with another, less specified form. Assuming the un-Impoverished paradigm is the nominal one, the hypothetical Impoverishment rule would be conditioned by a [+participant] node.[15] The marked feature would be shared by accusative and genitive cases, and would be deleted in the personal pronouns, causing accusative to syncretize with the less marked dative.

In Halle's (1997) system,[16] accusative and genitive are both [+structural].[17] We'll assume that dative is [−structural]. Let's also assume that accusative and dative are both [+dependent], while genitive is [−dependent]. [±oblique] is also present to distinguish the other cases in the paradigm. Here's the full set of case features that I assume are operative in Baoan, positive values highlighted:

[15] Third person forms are demonstratives, and pattern with the nominals, not the personal pronouns.

[16] See Müller (2003) for extensive justification of such feature systems for case morphology.

[17] So is dative, but we'll assume it's not in Baoan for the moment. It doesn't really matter what the features are called, anyway.

(23) CASE FEATURE COMBINATIONS IN BAOAN

[+**structural** −dependent −oblique]	=	Nominative
[+**structural** −dependent +**oblique**]	=	Genitive
[+**structural** +**dependent** −oblique]	=	Accusative
[+**structural** +**dependent** +**oblique**]	=	??
[−structural +**dependent** −oblique]	=	Dative
[−structural +**dependent** +**oblique**]	=	Ablative
[−structural −dependent −oblique]	=	??
[−structural −dependent +**oblique**]	=	Instrumental

The following VIs will then be relevant for Baoan case markers:

(24) a. /-se/ ⇔ KASE (Ablative) $\begin{bmatrix} \text{+oblique} \\ \text{+dependent} \end{bmatrix}$

b. /-ne/ ⇔ KASE (Genitive) [+structural]

c. /-GALE/ ⇔ KASE (Instrumental) [+oblique]

d. /-de/ ⇔ KASE (Dative) [+dependent]

e. Ø ⇔ KASE (Nominative) elsewhere

These VIs, competing in this order, will generate the nominal paradigm. This order is not guaranteed by the Elsewhere Principle alone as things stand, but it is plausible if we assume a feature hierarchy within Case features such that [±structural] > [±oblique] > [±dependent]. In particular, a KASE terminal node with the accusative feature bundle in (25) will be realized as *-ne* because (b) comes before (d) in the competition.

(25) KASE (=Accusative)
$\begin{bmatrix} \text{+structural} \\ \text{+dependent} \\ \text{+oblique} \end{bmatrix}$

Then an Impoverishment rule would apply only to KASE nodes next to personal pronouns, so that *-ne* does not realize accusative, but *-de* does. If we delete the [+structural] feature from feature bundles also containing [+dependent] in the environment of [+participant], as below, the only relevant feature remaining in the accusative feature bundle will be [+dependent]. Consequently, accusative will syncretize with dative rather than with genitive in the personal pronouns.

(26) BAOAN CASE IMPOVERISHMENT RULE

$$\text{KASE} \begin{bmatrix} \text{+structural} \\ \text{+dependent} \\ -\text{oblique} \end{bmatrix} \rightarrow \text{KASE} \begin{bmatrix} \text{+dependent} \\ -\text{oblique} \end{bmatrix} \; /\text{D}^0 \; [\text{+participant}] \_\_\_\_$$

"Delete [+structural] in [+dependent] 1 and 2 bundles"[18]

Impoverishment, then, could be employed to block *-ne* from showing up in the personal pronouns in the accusative in Baoan.[19] Here, metasyncretism is not at issue; it's just that underspecification cannot in principle do the job. The personal pronoun dative/accusative syncretism is not just a surface morphological phenomenon; it must be a deeper fact about the syntax or morphosyntax of Baoan.[20]

One final note about the Baoan case before we turn back to English: although there is no metasyncretism in the case endings, the suppletive pronominal *stems* in Baoan do show a metasyncretism, between dative and ablative, as shown in Table 9.4, stripped of their case suffixes. As can be seen from the table, different VIs, *na:, man, čo,* and *ta* all syncretize across dative and ablative. This suggests that an additional Impoverishment rule is in action, deleting [+oblique] from the ablative and causing it to conflate with the dative, in the terminal nodes that will be realized by the stems.

However, this Impoverishment rule crucially *cannot* be applying to the KASE terminal node, because if it did, the ablative suffix *-se* would never appear; the *-de* dative syncretism would spread to the ablative as well as the accusative. This means that this stem syncretism does not arise by secondary

[18] Noyer's cooccurrence type of Impoverishment rules, where the impoverished feature depends on his feature hierarchy, will give the wrong result here. We need to specify that it's [+structural] that's deleted, rather than [+dependent], even though to get the rule-ordering above we assumed that [± structural] > [± dependent] on the feature hierarchy.

[19] Trommer (1999) has suggested that Impoverishment is really spellout of a Ø VI, discharging the Impoverished features from the representation while leaving the others behind to be realized by another suffix. That could work for, e.g., gender being spelled out as a separate morpheme from number in Russian, but I don't think it will easily work here, because each feature in a case feature bundle does not usually correlate with its own position-of-exponence—case is not agglutinative, in other words. That is, there would have to be a Ø VI that spelled out *just* the [+structural] case feature in [+structural +dependent] bundles, and then the remainder of the bundle would get spelled out by the visible *-de* marker. To make this work, Fission would have to apply to this case feature bundle, separating off the [+structural] feature just in this context, but not otherwise. We might then expect to see cases where ablative case ([+dependent +oblique]) was marked by combining an instrumental ([+oblique]) marker with a dative ([+dependent]) marker; as far as I know, this does not occur (though perhaps the feature-based approach to case ending suggests it should).

[20] We could distinguish between the Numeration-bundling restriction possibility and the post-syntactic Impoverishment possibility by investigating whether the particular features at issue are syntactically active or not, for instance by testing passivization of personal pronouns in object position.

TABLE 9.4 Baoan Pronominal Stems

	1st person pronouns		2nd person pronouns	
	Singular	Plural	Singular	Plural
Nominative	*be-*	*mange-/bede-*	*če-*	*ta-*
Genitive	*me-*	*ma-/beda-*	*če-*	*ta-*
Accusative/dative/locative	*na:-*	*man-/bedan-*	*čo-*	*ta-*
Ablative	*na:-/be-*	*man-/bedan-*	*čo-*	*ta-*
Instrumental/comitative	*be-*	*mange-/beda-*	*če-*	*ta-*

exponence (morphologically conditioned allomorphy). It must be the case that the pronominal stem terminal node (D^0) receives its own set of Case features via Agree, which are realized along with the φ-features by the insertion of particular pronominal stems. This metasyncretizing Impoverishment rule for the ablative applies to *that* set of Case features, not to the KASE node's Case features. A similar problem arises in the analysis of Nubian, below: features that are crucially Impoverished in one terminal node appear to be fully active in another terminal node.

In any case, the point of the Baoan case suffixes is to show that pre-insertion Impoverishment or feature-bundling restrictions can be motivated without metasyncretism, to prevent the wrong VI from competing for a position of exponence in a place where we would otherwise expect it to appear.

9.5 Metasyncretism and Impoverishment in English pronouns

In conventional cell-uniting notation, the syncretisms of the English pronominal paradigms for each case we've been considering look like this:

(27) NOMINATIVE

Person	Singular			Plural		
	m	f	n	m	f	n
1		*I*			*we*	
2				*you*		
3	*he*	*she*	*it*		*they*	

(28) Accusative

Person	Singular			Plural		
	m	f	n	m	f	n
1	*me*			*us*		
2	*you*					
3	*him*	*her*	*it*	*them*		

(29) Genitive

Person	Singular			Plural		
	m	f	n	m	f	n
1	*my*			*our*		
2	*your*					
3	*his*	*her*	*it*	*their*		

As in Russian and Latin, we have metasyncretism in English pronouns. In each case, the shape of the paradigm is the same, even though the particular vocabulary items that realize each set of syncretic cells are not obviously based on a single set of stem forms.[21] Several identical patterns of syncretism appear in all Case paradigms:

(30) English Metasyncretisms

a. Gender is not marked in the personal pronouns (first and second person)

b. Gender is not marked in the plural pronouns

c. Number is not marked in the second person

Here are the vocabulary items from the big list in (10) that realize the nominative and genitive pronominal terminal nodes as in the paradigms shown above:

[21] It might not be impossible to propose a decomposition analysis, however; one could, for instance, analyze the *-r* in *our*, *your* and *their* as marking genitive, and the *-m* in *him* and *them* as accusative, and propose readjustment to the stems *you*, *he*, *we*, and *they* to get the right final shape.

(31) GENITIVE / NOMINATIVE

Genitive	Nominative
b. /awɹ/ $\Leftrightarrow \begin{bmatrix} \text{D}_{\text{RE}} \\ \text{+speaker +group +oblique} \end{bmatrix}$	a. /wij/ $\Leftrightarrow \begin{bmatrix} \text{D}_{\text{RE}} \\ \text{+speaker +group +superior} \end{bmatrix}$
e. /maj/ $\Leftrightarrow \begin{bmatrix} \text{D}_{\text{RE}} \\ \text{+speaker +oblique} \end{bmatrix}$	d. /aj/ $\Leftrightarrow \begin{bmatrix} \text{D}_{\text{RE}} \\ \text{+speaker +superior} \end{bmatrix}$
g. /jɔɹ/ $\Leftrightarrow \begin{bmatrix} \text{D}_{\text{RE}} \\ \text{+participant +oblique} \end{bmatrix}$	h. /juw/ $\Leftrightarrow \begin{bmatrix} \text{D}_{\text{RE}} \\ \text{+participant} \end{bmatrix}$
j. /ðɛɹ/ $\Leftrightarrow \begin{bmatrix} \text{D}_{\text{RE}} \\ \text{+group +oblique} \end{bmatrix}$	i. /ðej/ $\Leftrightarrow \begin{bmatrix} \text{D}_{\text{RE}} \\ \text{+group +superior} \end{bmatrix}$
n. /hɚ/ $\Leftrightarrow \begin{bmatrix} \text{D}_{\text{RE}} \\ \text{+feminine} \end{bmatrix}$	m. /ʃij/ $\Leftrightarrow \begin{bmatrix} \text{D}_{\text{RE}} \\ \text{+feminine +superior} \end{bmatrix}$
p. /hɪz/ $\Leftrightarrow \begin{bmatrix} \text{D}_{\text{RE}} \\ \text{+oblique} \end{bmatrix}$	o. /hij/ $\Leftrightarrow \begin{bmatrix} \text{D}_{\text{RE}} \\ \text{+superior} \end{bmatrix}$

l. /ɪt/ $\Leftrightarrow \begin{bmatrix} \text{D}_{\text{RE}} \\ \text{+neuter} \end{bmatrix}$

In the genitive, the ordering of all the VIs can simply fall out from the Elsewhere Principle in concert with the feature hierarchy. In the nominative, on the other hand, getting the right ordering is somewhat trickier, as we saw above in (20). It is crucial, for instance, that (h) be ordered before (m), or else nominative second person feminine feature bundles will be pronounced "she", rather than "you", but the Elsewhere Principle predicts the opposite ordering; ditto for (h) and (i) ("they" rather than "you"). So ensuring this order is crucial, if we want to avoid using negative features in our vocabulary items.

As noted above, we could just impose the needed ordering shown here by brute force. Then the syncretisms in each case paradigm would be entirely dependent on the particular (under)specifications of the vocabulary items relevant for each case. Nothing in principle would rule out the possibility of a VI that particularly refers to plural in the second person genitive (something like, say, *youser house*), for instance, even though there doesn't happen to be a second person VI that refers to plural in the accusative. On a VI-based treatment, number marking in the second person genitive is completely independent of whether there's number marked in the second person in any other case. As we have seen, VI-based syncretism doesn't predict such uniformities across paradigms, which appear to be generalizations about the whole grammar of a language.

If we adopt an Impoverishment account, however, we will capture these patterns across paradigms in a natural way. On an Impoverishment story, English-specific feature deletion rules will apply to terminal nodes with certain combinations of features, removing some of them prior to Vocabulary Insertion. It would then become *in principle* impossible for any vocabulary item to refer to one of the deleted features in the relevant terminal node. The absence of gender in the plural, for instance, becomes a grammar-wide fact, rather than an accident of vocabulary specification.

For English, the following Impoverishment rules could accomplish the necessary:

(32) Class → Ø / [+participant ______]
"Gender is deleted in first and second person"

(33) Class → Ø / [+group ______]
"Gender is deleted in the plural"

(34) Indv → Ø / [+participant −speaker ______]
"Number is deleted in the second person"[22]

(35) Superior → Ø / [+participant −speaker ______]
"Nominative is deleted in the second person"

These Impoverishment rules will generate the metasyncretisms of English. They also do something else, though: they *remove the ordering problems* for the Elsewhere condition that we encountered above, precisely because they delete the very features that were inviting inappropriate VIs into the competition.

Given the Impoverishments above, the 3sg.fem.nom pronoun *she* will no longer be in competition with the 1sg.nom pronoun *I* to realize a [+speaker +participant +superior +feminine] terminal node, as in (19) and (20) above, because no such terminal node will reach vocabulary item insertion—the Impoverishment rule (32) will have deleted [+feminine] from the representation, eliminating the /ʃij/ VI from the competition via the Subset Principle.

The same result will obtain for our ordering problem between *they, she*, and *you* in (21) and (22): the deletion of [+superior] case by the Impoverishment rule in (35) from terminal nodes containing [+participant −speaker] representations removes *they* and *she* from the competition, again by the Subset Principle.

[22] We do need to refer to negative features in this Impoverishment rule ([−speaker]). Since first person terminal nodes also contain a [+participant] node, but do represent number, we have to find a way for this Impoverishment rule to be blocked from applying to representations containing a Speaker node. Above, we have been assuming that in the syntax, terminal-node feature bundles are fully specified for both positive and negative features—it is only VIs which do not employ negative features. Alternatively, we could claim that second person is marked—i.e. rather than a [+speaker] feature, we need a [+addressee] feature, and first person is [+participant −addressee] (contra McGinnis 2004). In that case, Addressee could be referred to in this Impoverishment rule. The problem here is interestingly similar to the problem of third person *-s* in English, and to the problem of needing two gender-deleting Impoverishment rules here in (32) and (33). More on this below.

So, the Impoverishment rules that are motivated for English by the metasyncretic facts also happen to remove the need for brute-force ordering of VIs. Here, an independently motivated and well-used mechanism of the theory allows us to avoid an unmotivated, over-powerful stipulation.

9.6 Metasyncretism and Impoverishment crosslinguistically

Williams claims that metasyncretic patterns are common in languages of the world, but both he and Bobaljik only consider Indo-European languages (English, Latin, Russian). Indo-European generally shows a lot of metasyncretic behavior, particularly in syncretizing gender in the presence of plural number. Both Frampton (2002) and Nevins (2003) point out that an Impoverishment analysis predicts that metasyncretisms should be fairly stable over time, since they are not tied to any individual VIs. How common is metaparadigmatic behavior in the languages of the world?

In the Surrey Syncretisms Database (<http://www.smg.surrey.ac.uk/>), syncretisms of person, number, gender, and case are presented for thirty genetically diverse languages. Interestingly many of the metaparadigmatic syncretisms in their database look to be attributable to agglutinative synthetic morphology, where a single vocabulary item appears in multiple paradigms (see, e.g., note 3 on Latin above).

In order for metasyncretism to be an issue, there has to be syncretism driven by *distinct* vocabulary items with respect to the same sets of features; synthetic agglutinative morphology does not demonstrate it. Of the thirty languages in the Surrey syncretism database, at least nine involve something that really looks like indubitable metasyncretism: Aranoan, Baoan, Georgian, Limbu, Nubian, Rangpo, Tsakhur, Yimas, and Yupik; many of the others' syncretism patterns were too complicated to quickly determine whether they were metasyncretic or not. Below, I present five more instances of metasyncretism, from Georgian, Limbu, Tsakhur, Aranoan, and Nubian, and sketch Impoverishment analyses for Tsakhur, Aranoan, and Nubian.

9.6.1 *Recognizing metasyncretism: Georgian and Limbu*

In the complex Georgian agreement paradigm, we will look at only the transitive, non-inverted suffixes. In this pattern (Table 9.5), the first verbal suffix syncretizes in the same ways in all classes, despite the fact that this position of exponence is realized by distinct VIs in different classes (note that the prefixes are the same across all the classes except in the 3SGS-2PLO case). If we remove the nonvarying object prefixes and the nonvarying -*t* suffix from the table and rearrange the order of presentation of the rows so we can adopt

TABLE 9.5 Georgian non-inverted transitive agreement paradigms types A, B, C

Sub-Obj	A: 18 forms 3SG = *-s* class 1 present 'build' *šeneb*	B: 19 forms 3SG = vowel class 1 aorist 'build' *šen*	Type C: 20 forms class 2 present 'help' *exmareb*
1SG-2SG	*g- -Ø*	*g- -e*	*g- -i*
1SG-3	*v- -Ø*	*v- -e*	*v- -i*
1SG-2PL			
1PL-2PL	*g- -Ø -t*	*g- -e -t*	*g- -i -t*
1PL-2SG			
3SG-2PL		*g- -a -t*	
3PL-2PL	*g- -en*	*g- -es*	*g- -an*
3PL-2SG			
3SG-2SG	*g- -s*	*g- -a*	
1PL-3	*v- -Ø -t*	*v- -e -t*	*v- -i -t*
2SG-1SG	*m- -Ø*	*m- -e*	*m- -i*
2SG-3	*-Ø*	*-e*	*-i*
2SG-1PL	*gv- -Ø*	*gv- -e*	*gv- -i*
2PL-1SG	*m- -Ø -t*	*m- -e -t*	*m- -i -t*
2PL-3	*-Ø -t*	*-e -t*	*-i -t*
3SG-1SG	*m- -s*	*m- -a*	
3PL-1SG	*m- -en*	*m- -es*	*m- -an*
3SG-3	*-s*	*-a*	
3SG-1PL	*gv- -s*	*gv- -a*	
3PL-1PL	*gv- -en*	*g- -es*	*gv- -an*
3PL-3	*-en*	*-es*	*-an*

the conventional cell-uniting notation for the suffixes, the metasyncretic pattern in this position-of-exponence in the Georgian verb becomes much clearer (Table 9.6).

Across all three verb classes, patterns of syncretism are close to identical. Where A has *-en*, B has *-es*, and C has *-an*; in all but one place where A has *-Ø*, B has *-e*, and C has *-i*, and where A has *-s*, B and C have *-a*. Because their phonological forms are distinct in each class, they are separate vocabulary items, and the metasyncretic pattern needs to be captured before VI insertion. Again, this could be done morphologically, by manipulating the terminal node attached to this position-of-exponence with Impoverishment, or it could be a fact about the syntactic inventory, reflecting feature combinations available in the bundles of φ-features present in the Numeration, in which case we would expect them to have syntactic consequences. See Béjar (2000) and Řezáč (2003) for discussion and treatment; I will not attempt an analysis here.

Table 9.6 Georgian agreement patterns (simplified)

Sub-Obj	A: 18 forms 3sg = -*s* class 1 present 'build' *šeneb*	B: 19 forms 3sg = vowel class 1 aorist 'build' *šen*	Type C: 20 forms class 2 present 'help' *exmareb*
1sg-2sg			
1sg-3			
1sg-2pl			
1pl-2pl			
1pl-2sg	***-Ø***	***-e***	***-i***
1pl-3			
2sg-1sg			
2sg-3			
2sg-1pl			
2pl-1sg			
2pl-3			
3sg-2pl			
3sg-3			
3sg-1sg	***-s***	***-a***	
3sg-1pl			
3sg-2sg			
3pl-1pl			
3pl-3			
3pl-2pl	***-en***	***-es***	***-an***
3pl-2sg			
3pl-1sg			

To take another case, Limbu[23] shows agreement with subjects that distinguishes three numbers and four persons, with variation conditioned by tense and polarity. The forms for intransitive verbs are given in Table 9.7; we will look at the syncretisms in the suffixes, bolded in the table.

Here, again, we see metasyncretism: the syncretism patterns in the suffixes are exactly the same for all the tenses, although the vocabulary items are different. Despite the different other suffixes (e.g., the -*si* dual suffix in nonpast and the -*ϵtchi* dual suffix in past), the interesting "elsewhere" class of Lin.pl, 2sg, 3sg, and 3pl is the same across all columns, though realized with different VIs in each column: -Ø (positive nonpast), -*nϵ* (negative nonpast), and -*ϵ* (positive).

[23] A Tibeto-Burman Kiranti language, spoken in Nepal.

Table 9.7 Regular stem intransitive verbs in Limbu

	non past	past	negated non past	negated past
1ex.sg	*V-ʔɛ*	*V-aɔ*	*mɛ-V-ɛ-n*	*mɛ-V-aɔ-nɛ-n*
1ex.dl	*V-**si**-ge*	*V-**ɛtchi**-ge*	*mɛ-V-**si**-gɛ-n*	*mɛ-V-**ɛtchi**-gɛ-n*
1ex.pl	*V-i-ge*	*V-mʔna*	*mɛ-V-i-gɛ-n*	*mɛn-V-mʔna*
1in.dl	*a-V-**si***	*a-V-**ɛtchi***	*an-V-**si**-n*	*an-V-**ɛtchi**-n*
1in.pl	*a-V-**Ø***	*a-V-**ɛ***	*an-V-**nɛ**-n*	*an-V-**ɛ**-n*
2sg	*kɛ-V-**Ø***	*kɛ-V-**ɛ***	*kɛn-V-**nɛ**-n*	*kɛn-V-**ɛ**-n*
2dl	*kɛ-V-**si***	*kɛ-V-**ɛtchi***	*kɛn-V-**si**-n*	*kɛn-V-**ɛtchi**-n*
2pl	*kɛ-V-i*		*kɛn-V-i-n*	
3sg	V-**Ø**	*V-**ɛ***	*mɛ-V-**nɛ**-n*	*mɛ-V-**ɛ**-n*
3dl	*V-**si***	*V-**ɛtchi***	*mɛ-V-**si**-n*	*mɛ-V-**ɛtchi**-n*
3pl	*mɛ-V-**Ø***	*mɛ-V-**ɛ***	*mɛn-V-**nɛ**-n*	*mɛn-V-**ɛ**-n*

If this natural class is created through Impoverishing the relevant person features, its uniformity across classes is expected; if it's an accident of vocabulary item specification, its uniformity is a surprising coincidence. Note that any single one of these column patterns could be easily taken care of by appropriate VIs and the Elsewhere Principle. Here, again, we have a case where despite the fact that Elsewhere *could* handle the ranking in each individual case, Impoverishment must be applying anyway.

9.6.2 *Case 1: Tsakhur pronouns*

A relatively straightforward metasyncretism is seen in Tsakhur (Caxur)[24] pronouns, illustrated in Table 9.8 below (data from the report in the Surrey Syncretism Database). Here, we have a completely general syncretism between absolutive and ergative case in the personal pronouns (first/second person), rather similar to the Baoan case treated above. This poses no ordering problems, and could very easily be taken care of by the Elsewhere Principle and underspecification in each set of vocabulary items: while the attrI, attrII, and dative pronoun vocabulary items would be specified for person, number, and case (or case context, for those that look synthetic, as in attrI and attrII), the absolutive/ergative vocabulary items would just be specified for number and person: case would not be mentioned, and they would be ordered as the Elsewhere items in each competition, as follows:[25]

[24] A Lezgian, Nakh-Daghestanian language of Azerbaijan.

[25] Rather than do a breakdown of case features here, I've used regular case abbreviations as shorthand for the combination of features each represents. Nothing hinges on this in this present analysis; a feature-based analysis could capture exactly the same effects.

TABLE 9.8 Tsakhur pronominal/demonstrative forms (animate)

	1		2		3 (neuter demonstrative series)		
	SG	PL	SG	PL	SG		PL
					m	f	m/f
ABS	*zɨ*	*ši*	*RU*	*šu*	***mana***		*mammɨ*
ERG					*manG*$_o$*e:*	*manGe:*	*mammiše*
ATTRI	***jizda***	*jišda*	***jiRna***	***wušda***	*manGuna*	*manGɨna*	*mammišda*
ATTRII	***jizɨn***	*jišɨn*	***jiRɨn***	***wušun***	*manGun*	*manGɨn*	*mammišin*
DAT	***zas***	*šas*	***was***	*šos*	*manGus*	*manGɨs*	*mammišis*

(36) TSAKHUR PERSONAL PRONOMINAL VOCABULARY ITEMS IN AN IMPOVERISHMENTLESS ANALYSIS

a. /jiš/ $\Leftrightarrow \begin{bmatrix} \text{D}_{\text{RE}} \\ \text{+speaker} \\ \text{+group} \end{bmatrix} / \_\_ \begin{bmatrix} \text{Kase} \\ \text{+attr} \end{bmatrix}$ b. /wuš/ $\Leftrightarrow \begin{bmatrix} \text{D}_{\text{RE}} \\ \text{+participant} \\ \text{+group} \end{bmatrix} / \_\_ \begin{bmatrix} \text{Kase} \\ \text{+attr} \end{bmatrix}$

c. /jiz/ $\Leftrightarrow \begin{bmatrix} \text{D}_{\text{RE}} \\ \text{+speaker} \end{bmatrix} / \_\_ \begin{bmatrix} \text{Kase} \\ \text{+attr} \end{bmatrix}$ d. /jiR/ $\Leftrightarrow \begin{bmatrix} \text{D}_{\text{RE}} \\ \text{+participant} \end{bmatrix} / \_\_ \begin{bmatrix} \text{Kase} \\ \text{+attr} \end{bmatrix}$

e. /šas/ $\Leftrightarrow \begin{bmatrix} \text{D}_{\text{RE}} + \text{Kase}^{26} \\ \text{+speaker} \\ \text{+group} \\ \text{+dative} \end{bmatrix}$ f. /šos/ $\Leftrightarrow \begin{bmatrix} \text{D}_{\text{RE}} + \text{Kase} \\ \text{+participant} \\ \text{+group} \\ \text{+dative} \end{bmatrix}$

g. /zas/ $\Leftrightarrow \begin{bmatrix} \text{D}_{\text{RE}} + \text{Kase} \\ \text{+speaker} \\ \text{+dative} \end{bmatrix}$ h. /was/ $\Leftrightarrow \begin{bmatrix} \text{D}_{\text{RE}} + \text{Kase} \\ \text{+participant} \\ \text{+dative} \end{bmatrix}$

i. /ši/ $\Leftrightarrow \begin{bmatrix} \text{D}_{\text{RE}} + \text{Kase} \\ \text{+speaker} \\ \text{+group} \end{bmatrix}$ j. /šu/ $\Leftrightarrow \begin{bmatrix} \text{D}_{\text{RE}} + \text{Kase} \\ \text{+participant} \\ \text{+group} \end{bmatrix}$

k. /zɨ/ $\Leftrightarrow \begin{bmatrix} \text{D}_{\text{RE}} + \text{Kase} \\ \text{+speaker} \end{bmatrix}$ l. /RU/ $\Leftrightarrow \begin{bmatrix} \text{D}_{\text{RE}} + \text{Kase} \\ \text{+participant} \end{bmatrix}$

In Tsakhur (unlike English) the Elsewhere condition would operate perfectly satisfactorily to generate the correct order of competition for all these VIs— in particular, it will order the VIs in (36i–l) last, as the most underspecified. The lack of specification of VIs (i), (j), (k), and (l) for Case features will work

[26] I assume a fusion rule has unified D and Kase here and in the ergative/absolutive nodes, since the forms are not analyzable the way they are in the Attr cases.

perfectly well to create the syncretism between absolutive and ergative in the personal pronouns.

As should be clear by now, what this analysis misses is the metasyncretic pattern in the personal pronouns. Without Impoverishment of the terminal nodes, the lack of case specification in (36 i–l) is a happenstance property of each of four items; it could easily have turned out differently (e.g., the 2PL form in (36j) could refer to a particular case feature, independently of whatever (i), (k), and (l) are doing). This misses the generalization about the grammar of Tsakhur that there just is no absolutive/ergative distinction in the personal pronouns. It shouldn't be an "accidental" property of the vocabulary items involved.

Again, this could be a "deep" property of Tsakhur syntax—a property of the feature bundles in the Numeration—and again, if that were the case, we would hope to be able to discover syntactic ramifications of this absence of features. (For instance, Tsakhur might be a person-motivated split-ergative language, with an underlying nominative/accusative system for the personal pronouns; this could have consequences for syntactic processes that depend on the ergative/absolutive split.) On the other hand, it could just be a post-syntactic, preinsertion generalization about the morphosyntax, implemented via Impoverishment, in which case one would expect the personal pronouns to behave exactly the same, syntactically, as other ergative and absolutive DPs in the language. On the Impoverishment approach, Tsakhur needs an Impoverishment rule like the following:

(37) $$\left[\text{+ergative}\right] \rightarrow \varnothing \,/ \left[\begin{array}{l} \text{D}_{\text{RE}} + \text{K}\textsc{ase} \\ \text{+participant} \\ \underline{\qquad} \end{array}\right]$$

"Ergative case is deleted in 1 and 2 terminal bundles"

If absolutive is the unmarked case, the first and second person ergative terminal node combinations will become indistinguishable from the first and second person absolutive terminal node combinations. Now the syncretism across different VIs is predicted across the grammar.

Given the preinsertion feature reduction in the terminal nodes, it now so happens that the available VIs in Tsakhur participant pronouns match up one-to-one with the available terminal nodes—there just is no VI-driven, underspecification syncretism in the Tsakhur paradigm. We still need the Elsewhere Principle here, to prevent the VIs in (i), (j), (k), (l) from realizing other Case nodes, and to prevent singular forms from realizing plural nodes, but the *syncretism* in Tsakhur has nothing to do with the Elsewhere Principle.

TABLE 9.9 Aranoan Personal Pronouns (long forms only)

	person	singular	dual	plural
1IN	absolutive		*tseda*	*cuada*
	ergative genitive		$\boxed{\textit{tseada}}$	$\boxed{\textit{cuadaja}}$
1EX	absolutive	*ema*	*tsema*	*cuama*
	ergative	*yama*	$\boxed{\textit{tseama}}$	$\boxed{\textit{cuamaja}}$
	genitive	*quima*		
2	absolutive	*midya*	*metseda*	*micana*
	ergative	*midyaja*	$\boxed{\textit{metseada}}$	$\boxed{\textit{micanaja}}$
	genitive	*miqueda*		
3	absolutive	*joda*	*huatseda*	*naeda*
	ergative genitive	$\boxed{\textit{huada}}$	$\boxed{\textit{huatseada}}$	$\boxed{\textit{naedaja}}$

9.6.3 *Case 2: Aranoan pronouns*

The Aranoan[27] personal pronouns distinguish three cases, three numbers, and four persons. They are presented in Table 9.9. In all forms, there is a syncretism between the ergative and genitive form of the nonsingular pronouns. The ergative/genitive pronouns in the dual and plural can be derived from the absolutive one with the insertion of a single *a*-infix (in the dual) and a *ja*-suffix (in the plural).

(38) Absolutive duals + *a*-infix → Ergative/genitive duals

1IN	*tseda*	*tse**a**da*
1EX	*tsema*	*tse**a**ma*
2	*metseda*	*metse**a**da*
3	*huatseda*	*huatse**a**da*

(39) Absolutive plurals + *ja*-suffix → Ergative/genitive plurals

1IN	*cuada*	*cuada**ja***
1EX	*cuama*	*cuama**ja***
2	*micana*	*micana**ja***
3	*naeda*	*naeda**ja***

We could propose the following vocabulary items to capture this syncretism with underspecification, assuming ergative and genitive share some distinctive feature like [+oblique]:

[27] A Tacanan language spoken in Bolivia.

(40) *-a-* ⇔ KASE [+minimal +group +oblique]
-ja ⇔ KASE [+oblique]
Ø ⇔ KASE (absolutive)

But of course the metasyncretic point applies here: if *a* and *ja* are truly separate vocabulary items, then we're facing a metasyncretism again: two separate items creating the same syncretisms in two different number paradigms. There would be no reason, for instance, why some vocabulary item in the plural might not refer to an ergative feature, independently of what was happening in the dual. Consequently, we could capture this more elegantly, again, with an Impoverishment rule, deleting ergative case in the presence of [+group] (which is present in both dual and plural), to capture these metasyncretisms.[28]

9.6.4 *Case 3: Nubian verbal inflection*

Finally, I discuss a more complicated case, with dual exponence of certain features. Consider the Nubian interrogative verb forms[29] of *éd-* "take" in Table 9.10, as they are presented in the Surrey database. This looks like a good example of a metasyncretism—2SG and 3SG are syncretized across moods and tenses, as are 1PL and 2PL. Furthermore, we have a case of crossing syncretisms, like that observed in Baoan earlier—there is no form which uniquely identifies the 2SG or the 2PL slots in these moods. Impoverishment is definitely motivated here. Let us consider the forms in detail.

In the analysis I propose here, these verbs have the following structure: V-T/Agr-Mood-Agr_{Part}, obedient to the Mirror Principle except for the final Agr. A form that maximally illustrates these three inflectional positions of exponence is the first person plural form in the Interrogative II paradigm: *éd-r-ó-ò*, "take-PRES.PART-INTII-PART.PL." Notice that the difference between the 1SG and 1PL/2PL forms, across both moods, is that the 1SG form ends in *-è* while the 1PL and 2PL forms end in *-ò*. I claim that the final Agr represents Agree of first and second person subjects with the C^0 head, where I assume interrogative mood features are located; I will assume an Agr node is attached to the C^0 head either in the syntax or as a dissociated morpheme at spellout (Embick 1997).

[28] If "j" is a default consonant in the language, then it's possible that these are the same affix, with a phonologically driven syllable-fix in the plural. If *that* analysis were supported, the Elsewhere Condition would be useful (to order *-a-* with respect to Ø), and no metasyncretism would be present, despite appearances. Whatever other analysis of these pronouns is possible (*tse- (?+da)* looks like a dual-marking morpheme, e.g.), it would be irrelevant to the way case is realized in the system: the ergative/genitive syncretism would be totally driven by the relevant vocabulary item *-a-* and would not be "metaparadigmatic" at all.

[29] Judging from the description in the database report, Interrogative I is the inflection associated with yes-no questions, while Interrogative II is associated with *wh*-questions.

TABLE 9.10 Nubian interrogative verb inflection

	Interrogative I (Yes/No)			
	Present		Past	
	Singular	Plural	Singular	Plural
1	*éd-r-è*	*éd-r-ò*	*éd-s-è*	*éd-s-ò*
2	*éd-ì*		*éd-ò*	
3		*éd-ìnnà*		*éd-sà*

	Interrogative II (Wh)			
	Present		Past	
	Singular	Plural	Singular	Plural
1	*éd-r-é-è*	*éd-r-ó-ò*	*éd-s-é-è*	*éd-s-ó-ò*
2	*éd-náà*		*éd-ò-náà*	
3		*éd-innà-náà*		*éd-sà-náà*

The difference between the two types of interrogative mood is in the interrogative class II forms, which contain an extra prefinal vowel in the personal forms, and a *náà*-suffix in the 2SG and third person forms. The difference between the present tense and past tense in the first person singular and first/second person plural is that the present has an *-r* following the verb stem and the past has an *-s*. These are Tense markers, but they are conditioned by Agr too, since they don't show up in the third person forms or 2SG. Here we have a metasyncretic effect at work, since the *-r* and the *-s* are independent vocabulary items, but show identical syncretisms. How can we get them to show up in 1SG, 1PL, and 2PL but not 2SG?

To answer this question, we have to look at the 2/3SG syncretism. Here, we have another fairly clear case: *éd-ì* in the present shows this syncretism, as does *éd-ò* in the past. The *-ì* doesn't show up in the expected spot before the *náà*-suffix in the class II present tenses, although the *-ò* does in the past. Consequently, the present tense morpheme is analyzed as -Ø here, and the *-ì* is assumed to be inserted epenthetically (in the Surrey database notes, *ì* is mentioned as an epenthetic vowel in a different context; we will see it again below). So we have again two different tense morphemes (-Ø and *-ò*) in two paradigms showing the same syncretic patterns, hence, a metasyncretism. These Nubian inflection patterns, then, display two metasyncretisms, the *-r*/*-s* one in 1SG, 1PL, and 2PL and the -Ø/-ò one in 2SG, 3SG, and 3PL.

The metasyncretic character of this syncretism is confirmed in the "affirmative", a form used in rhetorical questions, which looks like a subclass of the class II interrogatives (same Mood suffixes) with a special Tense/Agr marker, *-min*, showing up in 1SG, 1PL, and 2PL (see Table 9.11). This syncretism pattern for *-min* is the same as for the *-r* and *-s* suffixes above. The -Ø/-ò syncretism across 2SG, 3SG, and 3PL in the previous case is repeated in the distribution of the other Tense/Agr marker in this mood, *-mi*. The only missing piece is the expected third person class II Mood marker *-náà* in 2SG/3SG, which shows up as expected in 3PL. We expect to see *-náà* here because it appeared in the *éd-náà* form in the equivalent cell in the regular class II forms. There's nothing incompatible between *-mi* or *-min* and *-náà*, as shown by the 3PL form here. So the absence of *-náà* in the 2SG-3SG cell needs accounting for.

TABLE 9.11 Nubian Affirmative mood

	Singular	Plural
1	*éd-min-é-è*	*éd-min-ó-ò*
2	*éd-mi*	
3		*éd-mì-náà*

If we Impoverish a second person [+participant] feature in the singular, causing 2SG representations to become identical to 3SG representations, both sets of syncretisms that we have identified will fall out.

(41) NUBIAN T/AGR IMPOVERISHMENT RULE

$$\underset{\text{T+AGR}}{\begin{bmatrix}\text{+participant}\\ -\text{group}\end{bmatrix}} \rightarrow \underset{\text{T+AGR}}{[-\text{group}]}$$

After Impoverishment, the 2SG terminal node's [+participant] feature is eliminated. Consequently, the failure of the person-conditioned Tense suffixes *-r* and *-s* to appear in 2SG is expected—no [+participant] features are present in 2SG, and they hence cannot compete to realize this node. This Impoverishment rule thus bleeds the [+participant] *-r*, *-s*, and *-min* Tense/Agr markers, and feeds the [−participant] -Ø, -ò, and *-mi* Tense/Agr markers.

(42) THE VIs OF NUBIAN (INTERROGATIVE) TENSE/AGR

a. /-s/ $\Leftrightarrow$ $\underset{\text{T + AGR}}{\begin{bmatrix}\text{+past}\\ \text{+participant}\end{bmatrix}}$

b. /-r/ ⇔ $\underset{[+\text{participant}]}{\text{T + A}\textsc{gr}}$

c. /-ìnnà/ ⇔ $\underset{[+\text{group}]}{\text{T + A}\textsc{gr}}$

d. /-sà/ ⇔ $\underset{\begin{bmatrix}+\text{past}\\ +\text{group}\end{bmatrix}}{\text{T + A}\textsc{gr}}$

e. /-ò/ ⇔ $\underset{[+\text{past}]}{\text{T + A}\textsc{gr}}$

f. /-min/ ⇔ $\underset{[+\text{participant}]}{\text{T + A}\textsc{gr}}$ /_____ $\underset{[+\text{affirm}]}{\text{M}\textsc{ood}}$

g. /-mi/ ⇔ T + Agr /_____ $\underset{[+\text{affirm}]}{\text{M}\textsc{ood}}$

h. /-Ø/ ⇔ T + Agr

Considering now the mood suffixes which follow the Tense/Agr suffixes in the Interrogative II forms and the Affirmative forms, we see that they also exhibit crossing syncretisms. In the 1SG, 1PL, and 2PL slots, past and present, the Interrogative II and Affirmative moods are realized by an additional vowel segment, whose features are specified by spreading from the Agr_{Part} suffix to its right. In the 2SG, 3SG, and 3PL slots, the Interrogative II mood is realized by the suffix *-náà*, again regardless of tense. These mood suffixes, then, are conditioned by the Tense/Agr features in the neighboring node—and that conditioning is affected by the Impoverishment rule affecting that node: the mood marker in 2SG is reduced to the *-náà* Elsewhere case because the neighboring Tense/Agr node's [+participant] feature has been Impoverished in the 2SG. In the Affirmative, things are somewhat more complicated: the *-náà* suffix only appears in 3PL, but not in 2SG and 3SG. I will assume that an additional Impoverishment rule has applied here in the 2SG and 3SG, deleting the [+wh] feature which would otherwise condition insertion of *-náà* and reducing it to the -Ø Elsewhere suffix that appears in the Interrogative I inflection. This Impoverishment rule is given in (43), and the vocabulary items for realizing the Mood node are given in (44):

(43) $\underset{\begin{bmatrix}+\text{wh}\\ +\text{affirm}\end{bmatrix}}{\text{M}\textsc{ood}} \rightarrow \text{M}\textsc{ood} \;/\; \underset{\begin{bmatrix}-\text{speaker}\\ -\text{group}\end{bmatrix}}{\text{T + A}\textsc{gr}}$ _____

(44) a. /-V/ ⇔ $\underset{[+\text{wh}]}{\text{M}\textsc{ood}} \;/\; \underset{[+\text{participant}]}{\text{T + A}\textsc{gr}}$ _____

b. /-náà/ ⇔ Mood
[+wh]

c. /-Ø/ ⇔ Mood

Before we can definitively provide VIs for the final $\mathrm{Agr}_{\mathrm{Part}}$ suffixes, however, we have to look at the indicative inflections in present, past and future (see Table 9.12). As for the Tense/Agr morphemes, in the third person plural, we see our familiar items *-innà* and *-sà*, for present and past, as well as two new items for the future, *-âll* in the first person and *-áà* elsewhere. We see *-r* in the 1sg and 1pl present[30] and *-s* in the 1sg, 1pl, and 2pl past, just as before. The agreement vowels on the end are absent, so those VIs must be conditioned for insertion in the interrogative moods only. I assume that the *-i* vowels in the first person forms are again epenthetic.

Table 9.12 Nubian indicative mood: present, past, future

	Present		Past		Future	
	Singular	Plural	Singular	Plural	Singular	Plural
1	*éd-ì-r*		*éd-ì-s*		*éd-âll*	
2	*éd-nâm*	*éd-l-ókòm*	*éd-o-nâm*	*éd-s-ókòm*	*éd-áa-nâm*	*éd-áa-l-ókòm*
3	*éd-ì*	*éd-innà*	*éd-ò*	*éd-sà*	*éd-áà*	*éd-áa-nà*

However, the analysis of the second person needs more attention now. We see an *-l* in the Mood slot in second person plural present and future. (We see the future tense marker *-áa* clearly in both the second and third persons, both singular and plural, which means the *-l* in 2pl.fut cannot be a Tense/Agr marker. The *-l* thus seems to be a special indicative mood marker conditioned by second person plural) We see two new $\mathrm{Agr}_{\mathrm{Part}}$ items following the *-áa* Tense marker and *-l* 2pl Mood marker, *-nâm* and *-ókòm,* conditioned by second person and number, appearing in all tenses. Given the presence of these items, it would appear that second person is *not* Impoverished in the singular in the indicative.

But if that's the case, then we would expect to see the [+participant] *-s* Tense/Agr form spread into the 2sg in the indicative past, and *-r* in the 2sg

[30] In the present indicative, however, the *-r* morpheme does not appear in 2pl, between the *éd-* and *-l*, as is expected. Perhaps it is phonotactically illegal there, or perhaps the Impoverishment rule for Tense/Agr is conditioned only to apply in the past indicative, Interrogative I and II, and Affirmative moods.

in the indicative present. However, we do not see this—rather, the syncretism of 2SG with 3SG remains intact in the nonfuture Tense/Agr slot; we get the *-Ø* present and *-o* past tense markers in 2SG (*ed-**o**-nâm*), as in the interrogative. In the past, the *-s* morpheme still presents its L-shaped syncretism pattern, conflating 1SG, 1PL, and 2PL.

As noted above, I assume a pre-spellout operation creates the extra Agr_{Part} node outside Mood (in C^0) from [+participant] subject representations. The creation of this node must occur *before* the Impoverishment operation at morphology that deletes the [+participant] feature from Tense in the T+AGR node. Then Impoverishment applies, and the Tense/Agr node syncretizes, but the newly created Agr_{Part} does not. (This is the same solution to the same problem that we saw in Tsakhur, above: double exponence, where an Impoverishment rule applies to one node but not the other.) That is, in these cases, the metasyncretism *must* be postsyntactic, not created in the Numeration, because if these Agr_{Part} nodes never contained the [+participant] feature in the 2SG, the VIs realizing that node would never be able to refer to it.

The VIs for the Agr_{Part} node, the additional VIs for future Tense/Agr and the additional VI for 2PL indicative Mood, are presented in (45), (46), and (47) below:

(45) a. /-ókòm/ $\Leftrightarrow \text{Agr}_{\text{Part}} \begin{bmatrix} +\text{participant} - \text{speaker} \\ +\text{group} \end{bmatrix}^{31}$ $/\ \underset{[+\text{indicative}]}{\text{MOOD}}\ \_\_\_$

b. /-nâm/ $\Leftrightarrow \underset{[+\text{participant} -\text{speaker}]}{\text{Agr}_{\text{Part}}}$ $/\ \underset{[+\text{Indicative}]}{\text{MOOD}}\ \_\_\_$

c. /-ò/ $\Leftrightarrow \text{Agr}_{\text{Part}} \begin{bmatrix} +\text{participant} \\ +\text{group} \end{bmatrix}$

d. /-è/ $\Leftrightarrow \underset{[+\text{speaker}]}{\text{Agr}_{\text{Part}}}$

e. /-Ø/ $\Leftrightarrow \underset{\text{Elsewhere}}{\text{Agr}_{\text{Part}}}$

[31] I have included reference to the negative feature [−speaker] here to prevent this VI from being realized in the first person indicative, which will also be marked [+participant]. In order to capture this pattern without negative features, I could either refer to a [+addressee] feature, assuming second person is more marked than first in this language, or appeal to another Impoverishment rule deleting features from [+speaker] Agr_{Part} nodes in the indicative.

Table 9.13 Nubian Tense/Agreement, Mood, and [+participant] Agreement suffixes

<table>
<tr><th colspan="2"></th><th colspan="2"></th><th colspan="2">Indicative</th><th colspan="2"></th><th colspan="2"></th><th colspan="2">Interrogative</th><th colspan="2"></th></tr>
<tr><th colspan="2"></th><th colspan="2">Future</th><th colspan="2">Present</th><th colspan="2">Past</th><th colspan="2">Interrogative I</th><th colspan="2">Interrogative II</th><th colspan="2">Affirmative</th></tr>
<tr><td rowspan="3">T/Agr</td><td>1</td><td colspan="2">-âll</td><td colspan="2">-r</td><td colspan="2">-s</td><td colspan="4">-r</td><td colspan="2">-min</td></tr>
<tr><td>2</td><td colspan="2" rowspan="2">-áa</td><td rowspan="2">-Ø</td><td>*</td><td rowspan="2">-o</td><td></td><td colspan="2" rowspan="2">-Ø</td><td colspan="2"></td><td rowspan="2"></td><td></td></tr>
<tr><td>3</td><td>-ìnnà</td><td>-sa</td><td colspan="2">-ìnnà</td><td>-mi</td></tr>
<tr><td rowspan="3">Mood</td><td>1</td><td rowspan="3">-Ø</td><td></td><td rowspan="3">-Ø</td><td></td><td colspan="4" rowspan="3">-Ø</td><td colspan="2">-V</td><td colspan="2">-V</td></tr>
<tr><td>2</td><td>-l</td><td>-l</td><td rowspan="2"></td><td></td><td rowspan="2">-Ø</td><td></td></tr>
<tr><td>3</td><td>-nà</td><td></td><td>-náà</td><td>-náà</td></tr>
<tr><td rowspan="2">Agr_{Part}</td><td>1</td><td colspan="6">-Ø</td><td colspan="3">-è</td><td colspan="3" rowspan="2">-ò</td></tr>
<tr><td>2</td><td colspan="3">-nâm</td><td colspan="3">-ókòm</td><td colspan="3">-Ø</td></tr>
</table>

Notes:

Paradigms that stretch across multiple table columns apply to multiple conjugations. For instance, $\boxed{\emptyset}$ is the Mood paradigm for both Past and Interrogative I. Within each paradigm, the left-hand column is singular, the right-hand column plural, irrespective of stretching across multiple columns.

* The absence of *-r* for 2PL here is unaccounted for. See footnote 26.

(46) a. /-âll/ $\Leftrightarrow$ T + Agr $\begin{bmatrix}\text{+future}\\ \text{+speaker}\end{bmatrix}$

b. /-áa/ $\Leftrightarrow$ T + Agr [+future]

(47) /-l/ $\Leftrightarrow$ Mood [+indicative] / T + Agr ______ $\begin{bmatrix}\text{+participant} - \text{speaker}\\ \text{+group}\\ -\text{past}\end{bmatrix}$

To summarize the analysis, I present Table 9.13 which corresponds to the three terminal nodes which I have proposed are being realized by the various suffixes in the Nubian inflectional system. The table represents the (epiphenomenal) paradigms created by competition for these particular nodes.

If the metasyncretic clues are followed, we can see that we are pushed to certain conclusions about the nature of the final Agr node. In particular, it cannot simply be some sort of special C^0 morpheme whose allomorphs are simply morphologically *conditioned* by the agreement in the T/Agr node—that is, it cannot be a case of *secondary* exponence, because in T/Agr, metasyncretism tells us second person is Impoverished, while in this final Agr slot, second person is fully active. The same is true for the Baoan case suffixes and case-conditioned pronominal stems: the metasyncretism tells us that the terminal nodes the case suffixes are competing for are Impoverished, but the pronominal stems depend on precisely the features that are Impoverished. Consequently, there must be two sets of the features present.

9.7 Conclusions

In this paper, I have argued that if we take the point about metasyncretism made in Williams (1994) seriously, then Impoverishment or syntactic feature-bundling restrictions can be discovered quite easily by comparing syncretisms across paradigms. When an analysis is adjusted to take the metasyncretically motivated terminal-node reductions into account, it is very often the case that problems of rule-ordering for vocabulary item insertion are eliminated, in many cases eliminating the need for reference to a negative feature in a VI, or resolving an otherwise puzzling violation of the Elsewhere ordering condition. In any case, the metasyncretism phenomenon does seem to be fairly common across languages, occurring in several non-Indo-European languages considered here as well as the well-attested Indo-European case.

If Frampton (2002) and Nevins (2003) are correct, then diachronic stability of syncretisms could be another clue to the constitution of the terminal node feature bundles available in the syntax or pre-Insertion morphosyntactic component.

This type of phenomenon could then provide a starting point for morphosyntactic and morphosemantic investigation: if features are subject to metasyncretism, it is possible that they are simply not present in the syntax at all, neither at LF nor at PF, and hence should not be able to drive syntactic operations. Further, if they are not present at LF, one might expect metasyncretic forms to show evidence of semantic underspecification, as well as morphological underspecification. Such an investigation would require a better understanding of the semantics of morphosyntactic feature bundles. However, simply being able to identify good candidates for such investigation via the metasyncretic phenomenon could, I feel, be a significant step forward.

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10

Where's Phi? Agreement as a Postsyntactic Operation

JONATHAN DAVID BOBALJIK

10.1 Introduction

One striking aspect of the study of φ-features (person, number, gender) is their propensity to enter into agreement dependencies, morphologically signaled on elements in the clause distant from their source. Russian (1) illustrates: morphemes expressing the φ-features of the NP meaning "girl(s)" surface on the finite verbs and on coreferential pronouns.

(1) a. Devočk-**a** poigral-**a** v komnate. Potom on-**a** pospal-**a**.
girl-FEM played-FEM in room then PRON-FEM slept-FEM.
"The girl played in the room. Then she slept."

b. Devočk-**i** poigral-**i** v komnate. Potom on-**i** pospal-**i**.
girl-PL played-PL in room then PRON-PL slept-PL.
"The girls played in the room. Then they slept."

In this paper, I argue that agreement (copying or sharing of φ-features) is a morphological, not a (narrowly) syntactic process (see also Marantz 1991, cf. Heim this volume on pronominal agreement). I assume a theoretical model in which the syntactic component generates (via Merge and Move) an abstract

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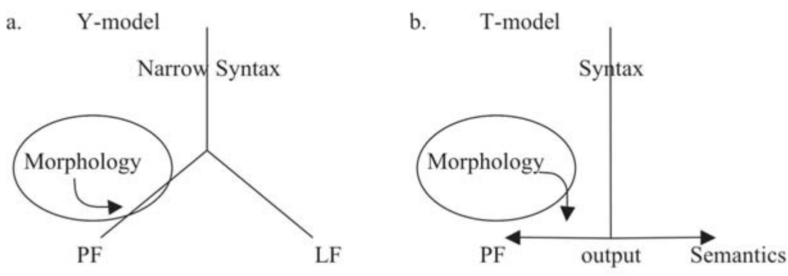
representation which in turn serves as the input to two interpretive components, as sketched in (2a), or (2b).[1] This conception of grammar follows the general GB/Minimalist Program (MP) architecture, supplemented by the postulation of a *Morphology* component as part of Spell Out (Halle and Marantz 1993). That is, Morphology refers to a part of the mapping procedure that takes a syntactic structure as its input and incrementally alters that structure in order to produce a phonological form. A process may thus be "morphological", yet make direct reference to syntactic configuration in the input, just as prosodic phrasing, sandhi rules, and the like are part of the phonology yet require reference to syntactic structure.

(2) THE PLACE OF MORPHOLOGY



In what follows, I give two arguments in favor of treating agreement as an operation in the morphological component, as defined in (2). Both revolve around how the controller of agreement is determined. For the sake of concreteness, the general proposal will be that morphological agreement is governed by (3), at least for languages in which only one NP controls agreement on the finite verbal complex (i.e., the verb plus an Infl or Aux element; I will refer to this loosely as the "finite verb").[2]

(3) The controller of agreement on the finite verbal complex (Infl+V) is the *highest accessible* NP in the *domain* of Infl + V.

[1] The difference between these models lies in whether there is a separate cycle of covert syntax after Spell Out (as in (2a)). In the model in (2b) (see Bobaljik 2002, and references therein) the interpretive components see only the final syntactic representation, including the output of covert movement. This distinction is immaterial to the first part of this chapter, but adopting (2b) is important in Section 10.5.

[2] I take (3) to define a necessary, but not a sufficient, condition for agreement. UG imposes (3) at a minimum (thus no language may skip an accessible NP), but languages may impose additional restrictions whereby the controller identified by (3) may fail to agree (say, animacy, plurality, specificity, etc.). See Corbett (2006) for an extensive survey.

This hypothesis has three crucial parts, as italicized. The major focus of this paper is on *accessibility*. I argue that *accessibility* is defined in terms of morphological case (m-case), rather than abstract case, grammatical function (GF), or other syntactic relation (see also Falk 1997, Sigurðsson 1993). Within the architecture in (2), this is significant since there is independent reason to believe that m-case is itself a part of the morphological component (Section 10.2). This leaves us with an order-of-operations argument: if agreement is dependent on the outcome of a postsyntactic operation (m-case), then agreement must also be postsyntactic (Section 10.3).

In Section 10.4 I will briefly discuss the role of *highest*, in particular, focusing on how the interaction of *highest* and *accessibility* yields a new account of an old typological generalization about ergative splits. Section 10.5 turns briefly to *domains*, providing converging evidence for the hypothesis in (3) from a "close enough" effect—an NP need bear no relation to a verb other than satisfying morphological accessibility and locality in order to trigger agreement on that verb. This contrasts with the proposal in Chomsky (2001) under which agreement is a reflection of core-licensing (feature-checking) relations in the syntax. The evidence for the "close enough" effect comes from Long-Distance Agreement constructions which appear to span domains, though, for now, it is sufficient to think of domains as imposing a clausemate condition on agreement. In the final section of the chapter, I touch rather superficially on some points of contact between the proposals here and some alternatives, in particular arguing in Section 10.6 that "defective intervention" constraints in Icelandic (in which an inaccessible NP appears to block agreement with an accessible one) are plausibly better analyzed as involving restrictions on either movement or domains, but not agreement.

10.2 On case and licensing

Before turning to the main points of this paper, it will be useful to review some of the arguments for distinguishing m-case from syntactic licensing, and for treating the former as a morphological operation, since it is this assumption that forms the lynchpin of the order-of-operations argument to be given below. The canonical discussion of this distinction comes from the phenomenon of "quirky case" in Icelandic.

10.2.1 *Quirky case*

As has been known since at least Andrews (1976) and Thráinsson (1979), Icelandic has a range of subjects that bear a morphological case other than nominative. Dative subjects, for example, occur as external arguments to a range of experiencer predicates (4a,b) and also as the derived subjects in the passives of goal-selecting verbs (4c,d). Note that dative subjects cooccur with nominative objects.[3]

(4) a. Jóni líkuðu þessir sokkar
Jon.DAT like.PL these socks.NOM
"Jon likes these socks." (JGJ, 143)

b. Það líkuðu einhverjum þessir sokkar
EXPL liked.PL someone.DAT these socks.NOM
"Someone liked these socks." (JGJ, 153)

c. Þeim var hjálpað
them.DAT was.SG helped
"They were helped." (ZMT, 97)

d. Um veturinn voru konunginum gefnar ambáttir
In the winter were.PL the king.DAT given slaves.NOM
"In the winter, the king was given (female) slaves." (ZMT, 112)

As Icelandic is a Verb-Second language, clause-initial position is not a reliable diagnostic of subjecthood, but there is an extensive literature presenting more than a dozen subjecthood diagnostics that all converge on the dative NP in examples like (4) (see especially Zaenen et al. 1985, Sigurðsson 1989 et seq.). In addition, Harley (1995) and Jónsson (1996) have carefully established that the nominative objects in such quirky-subject constructions are indeed objects, and systematically fail the corresponding subjecthood tests. For example, (4b) involves an expletive in clause-initial position, which forces the subject (the dative NP), but not the object (nominative), to be indefinite, while in (4d), the position between finite auxiliary and participle is a reliable diagnostic for subjecthood, again, uniquely picking out the dative NP. Control constructions provide another diagnostic: in the infinitival clause, the subject must be PRO, while the object cannot be. The contrast in (5) shows that the dative is the subject, and the nominative is the object.

(5) a. Jón vonast til [að ___ líka þessi bók]
Jon.NOM hopes for to PRO.DAT like this book.NOM
"Jon hopes to like this book." (JGJ, 115)

b. *María vonast til [að ___ líka Jóni]
Maria.NOM hopes for to PRO.NOM like Jon.DAT
"Maria hopes that John likes her." (JGJ, 116)

[3] In (4) and subsequent examples, "JGJ" refers to Jónsson (1996); "ZMT" to Zaenen, Maling, and Thráinsson (1985).

German provides an instructive minimal contrast. German also has dative–nominative case arrays in which the dative c-commands the nominative (see Frey 1993, Haider and Rosengren 2003, Wurmbrand 2006) but German lacks quirky case and it is the nominative, not the dative, which passes the subject tests, including replacement by PRO in control infinitives (6).

(6) a. *Ich hoffe [__ der Leo zu gefallen]
I hope PRO.DAT the.NOM Leo to like
"I hope to like Leo."

b. Ich hoffe [__ dem Leo zu gefallen]
I hope PRO.NOM the.DAT Leo to like
"I hope that Leo likes me."

With the exception of their morphological case (and agreement) properties, quirky subjects are subjects, and nominative objects are objects, in whatever manner these terms are to be theoretically defined. This is particularly relevant within GB/MP approaches, since the distributional diagnostics at issue (for example, the distribution of PRO versus lexical NP) have been seen as the purview of *Case Theory* since Chomsky (1981). The star witness for invoking Case Theory in this context is the ECM/Raising-to-Object configuration. When the infinitive is embedded under a case-assigning verb such as *believe*, the PRO requirement is lifted and a lexical NP subject is allowed (see (7)).

(7) Hann telur **Maríu** vita svarið.
He believes Maria.ACC to know answer
"He believes Maria to know the answer." (JGJ, 168, adverb omitted)

Quirky subject NPs have exactly the same distribution as non-quirky subjects. They are obligatorily replaced by PRO in infinitive clauses (5a), except when the infinitival clause is the complement to an ECM verb (8).

(8) Ég tel **þeim** hafa verið hjálpað í prófinu
I believe them.DAT to have been helped in the exam
"I believe them to have been helped in the exam." (ZMT, 107)

In sum, the moral of Zaenen et al. (1985) is that all of the syntactic effects attributed to Case Theory in GB are robustly evident in Icelandic, but can only be understood if one ignores the case that NPs actually happen to bear. We must conclude that the syntactic distribution of NPs is not governed by considerations of case as manifest morphologically, but rather by some more abstract system of syntactic licensing. Within GB/MP, this abstract system is called "Structural Case" (Cowper 1988, Freidin and Sprouse 1991). Terminology aside, whatever the nature of the abstract syntactic licensing responsible for "Case Theory" effects, Icelandic shows that this system is distinct from the algorithms that assign m-case.

10.2.2 *M-case*

The literature contains a variety of proposals for the characterization of the m-case algorithms (see Zaenen et al. 1985, Yip et al. 1987, Marantz 1991, and recently McFadden 2004). While these differ in many respects, a common property is that the m-case assignment rules must make reference to syntactic structure in their structural description (input), but they effect no change to the syntactic representation (output). No rules of the syntax proper make reference to the output of the rules of m-case assignment. Within the models in (2), the proper place of the rules of m-case assignment is thus the Morphological component, a part of the PF interpretation of syntactic structure. One proposal in this vein is that of Marantz (1991), the essentials of which I will adopt here.

Marantz proposes that there are three primary types of morphological case: (i) lexical (including quirky) case assigned idiosyncratically by particular lexical items; (ii) unmarked case (conventionally called nominative for nominative–accusative languages, and absolutive for ergative languages); and (iii) "dependent" case. Dependent case is assigned only when more than one NP in a single domain is eligible to receive m-case from the case-assignment rules. For nominative–accusative languages, the dependent case is accusative, and is assigned to the lower NP in the domain, while for ergative languages, the dependent case is ergative, assigned to the higher NP. Marantz suggests that the assignment of morphological cases proceeds via a disjunctive hierarchy, as follows.[4]

[4] Unmarked case is unmarked for a particular syntactic environment, such as clauses. For Marantz, genitive is the unmarked case for an NP-internal configuration. I lay aside discussion of genitive case throughout this chapter. To simplify, I also draw no distinctions among the oblique cases, lumping them together under the "lexical" rubric (but see n. 8). Marantz also recognizes a fourth type of case, namely default case, assigned in extra-syntactic environments when no other rules apply. For English, the default case is the accusative, and is used in a heterogeneous set of environments, such as the pronouns in "Me too", "That's me" (see Schütze 1997). Finally, morphological case as used here refers to the morphological features, that are in turn subject to rules of exponence/realization, and is thus distinct from surface phonological form. Thus even in a language with a relatively rich case system like Russian or Icelandic, nominative and accusative for certain classes of nouns may be syncretic/homophonous, but nominative and accusative must still be distinguished for the purposes of accessibility. Thus I retain a certain degree of abstractness to case, but this abstractness is only relevant to rules of realization and patterns of syncretism.

(9) Case Realization Disjunctive Hierarchy Domain: government by V+I

a. lexically governed case
b. dependent case (accusative, ergative)
c. unmarked/default case

The workings of the hierarchy are schematized roughly as in the derivations in (10), which represent the case arrays for a regular nominative/accusative verb "love" and a quirky-dative-assigning verb "like" in Icelandic.

(10)	a. Subj	loves	Obj	b. Subj	likes	Obj	
	—		—	DAT		—	lexical
	—		ACC	dat		—	dependent
	NOM		acc	dat		NOM	unmarked

The first m-case assigned is lexical; this applies only in (10b), as the verb meaning "like" assigns quirky dative to its subject (4a–b). Next, dependent cases are assigned. In (10a), there are two NPs requiring m-case, and the lower one receives accusative. In (10b), since the subject has received lexical case, it is out of contention, and thus dependent case is not assigned. Finally, the remaining caseless NP in each derivation receives unmarked case. In (10a) this is the subject, yielding the NOM–ACC array, while in (10b) only the object is without m-case and hence it receives nominative (as in (4a,b,d)).[5] Further details of the algorithm are not important, and the reader is referred to the literature cited for a deeper understanding and for various refinements.

What is important here is the flow of information in the system. The morphological case-assignment algorithm makes reference to syntactic structure; at a minimum, in order to correctly allocate dependent cases, the relative hierarchical positions of two competing NPs must be known, a property that is established by the syntax. On the other hand, there is no evidence that syntax ever sees the output of the morphological case-assignment algorithms. This was the point of the separation of licensing (GB/MP's Case-checking) and m-case. These properties follow of course if morphological case-assignment is part of a postsyntactic morphological component (see (2))—m-case assignment happens "too late" in the derivation for syntax to make reference to it.

[5] Nominative case assignment is not an obligatory property of finite clauses. If the only argument in the clause bears a lexical case, such as dative (as in (4c)), no further case assignment takes place, and the verb shows default agreement. There is, crucially, no evidence for a (null) expletive here: Icelandic has expletives, and these impose various requirements on the subject NP, including a definiteness restriction. This applies equally to dative subjects (Jonas 1996), hence the absence of any such effect in (4c) argues against positing such an element. See Wurmbrand (2006) for additional discussion.

Armed with this understanding of m-case, we may now proceed to a discussion of the relationship between m-case and agreement.

10.3 Accessibility: agreement, case, and grammatical function

I turn now to the evidence that agreement is sensitive to the output of the m-case algorithms, from which I draw the conclusion that agreement, like m-case, is a postsyntactic operation.

10.3.1 *The Moravcsik Hierarchy*

Moravcsik (1974) presented a set of universals regarding (NP–predicate) agreement. The universals are formulated in terms of GFs (subject, object, etc.), and include the implicational hierarchy in (11) (see Moravcsik 1978 for revisions).

(11) The Moravcsik Hierarchy
Subject > Object > Indirect Object > Adverb

This hierarchy ranges over languages, not sentences, and conflates a set of implicational universals. If in some language the verb agrees with anything, it agrees with some or all subjects. Likewise, if the verb in some language agrees with anything other than subjects, it agrees with some or all direct objects. And so on.[6] A survey of 100 genetically and areally diverse languages (Gilligan 1987) confirms this broad picture. As shown in (12), the hundred languages in Gilligan's survey are divided roughly equally among the four types that are consistent with the hierarchy, while the four types that are not consistent with the hierarchy are unattested.[7] For example, no language has agreement with nonsubject arguments, but systematically lacks subject agreement.

(12)	No Agreement:	23	IO only:	0
	S only:	20	DO only:	0
	S–DO:	31	IO, DO only:	0
	S–IO–DO:	25	S–IO, not DO:	(1)

In this section, I argue that the Moravcsik Hierarchy should be restated in terms of m-case rather than GF. More specifically, I argue that the hierarchy should be stated in terms of the categories of morphological cases suggested

[6] The "some or all" phrasing accommodates the observation that the accessibility hierarchy imposes a necessary, but not a sufficient, condition for agreement (see n. 2).

[7] Gilligan's survey does not include the Adverb category. Note also that one language, Waskia, is given as having indirect-object agreement but lacking direct-object agreement. The phenomenon he reports (p. 191) as IO-agreement is suppletion of the verb meaning "give" for person and number of the indirect object. Person-governed suppletion with "give" seems to be a phenomenon independent of agreement as such (see Comrie 2000).

by Marantz (1991) as discussed in section 10.2.2. That is, I argue here that (11) should be reformulated as (13).[8]

(13) The Revised Moravcsik Hierarchy (M-Case)
Unmarked Case > Dependent Case > Lexical/Oblique Case

My proposal is that morphological case delineates an accessibility/markedness hierarchy for morphological agreement.[9] If, in language L, accusative NPs (a dependent case) are accessible for agreement, then, by (13), nominative NPs in L must also be accessible for agreement. In languages with rather boring morphological case systems, where m-case tracks GF fairly neatly (for example, Russian and German), (13) is equivalent to (11). The interest comes from languages in which case and GF do not always line up. The thesis I pursue here is the following (see also Falk 1997):

(14) When case and GF diverge, it is m-case, not GF, that defines accessibility for agreement.

In the next subsections, I turn to an examination of case–GF mismatches that illustrate (14). In each case the controller of agreement is determined by m-case and not GF. For example, when there are non-nominative subjects, and nominative non-subjects, it is nominative (unmarked) case and not subjecthood that is the correct predictor of agreement. This state of affairs has generally been recognized for each of the languages discussed; what I contend here, following Falk (1997), is that this is the normal, universal state of affairs, at least for single-agreement languages.[10] Finally, in Section 10.3.3, I note that the hierarchy as presented here provides a straightforward explanation for an

[8] I have also left off Moravcsik's "adverb" category as this is not relevant to the discussion below. The simplifications in notes 2 and 4 are carried over here. For example, many languages that allow or require agreement with some dative NPs do not permit agreement with all datives. In a not uncommon type, among dative NPs only the goal argument of verbs meaning "give" governs agreement (as in Chukchi; Comrie 1979); more complicated systems are exemplified by Basque, as discussed in Řezáč (this volume).

[9] The hierarchy in (13) converges with the markedness hierarchy proposed in Blake (2001, chapter 5) for morphological case systems (independent of agreement). Note that although I will use the term markedness in the discussion below, nothing in my use of the term should imply a commitment to any of the many uses to which this term has been put. By more or less "marked", I mean only the status on the hierarchy in (13) and the associated case-algorithm discussed in Section 10.2.2. In particular, I make no claims about morphological markedness in the normal sense of "bearing a formal mark" as opposed to zero; thus unmarked case under (13) may bear a mark, as in Icelandic and other languages.

[10] The arguments from Icelandic and Hindi for the dependence of agreement on (m)-case follow Falk (1997). Falk encodes morphological markedness in the syntactic representation and draws a sharp two-way divide between unmarked and marked. As far as I can see, this does not extend to the (at least) three-way distinction needed to capture the Moravcsik Hierarchy. In further establishing the validity of the generalization, I have surveyed the theoretical literature, investigated all apparent counterexamples that have been brought to my attention, and sampled grammars from the 100-language WALS survey (Haspelmath et al. 2005). While I have found no counterexamples in the WALS grammars, this

often-noted universal asymmetry regarding case-agreement splits in ergative languages.

10.3.2 *Icelandic nominative objects once more*

Recall from Section 10.2 that Icelandic has non-nominative subjects, and nominative non-subject NPs. Yet, as Sigurðsson (1993 et seq.) has stressed, agreement tracks m-case. Datives never control agreement, even when the dative passes all other subjecthood diagnostics (see (15)).

(15) * Morgum studentum líka verkið
many students.DAT like.PL job.NOM
"Many students like the job." (Harley 1995: 208)

Similarly, a nominative NP controls agreement, even when it is unambiguously the object (see examples (4b,d) above).[11] Under the GF-based hierarchy, Icelandic would be described as a language that shows some object agreement, and agreement with some subjects. This description is consistent with the Moravcsik Hierarchy, but would have to be supplemented by (14), as a language-particular quirk. By contrast, the view I advocate here is that the only thing quirky about Icelandic is that it has quirky case. That it is (nominative) objects that control agreement, and not quirky subjects in the relevant constructions, follows as an automatic consequence of stating the implicational universals in terms of morphological case (13). My view, then, is that (14) is not a language-particular supplement to a set of universal implications; it is instead derivable directly from UG.

10.3.3 *Ergativity and the Moravcsik Hierarchy: A typological puzzle*

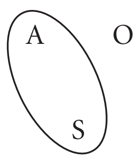
A different kind of m-case–GF mismatch is exemplified by the phenomenon of ergativity. In an ergative case system (16b), the subject of an intransitive verb (S) is formally marked in the same manner as the object of a transitive verb (O), with the subject of the transitive verb (A) bearing a special mark. This

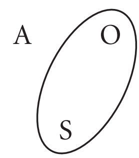
conclusion must be tempered by the fact that many of the grammars do not provide sufficient detail to identify possible case–GF mismatches. Note that I have excluded from consideration languages in which only a number contrast is marked on the verb, as it is often difficult from the evidence presented in available descriptions to distinguish between number agreement and the marking of "verbal number" (sometimes referred to as "pluractionality") which may overlap semantically but are distinct phenomena; see Corbett (2000, chapter 8) and references therein.

[11] There are various additional qualifications to be made regarding agreement with non-subject nominatives in Icelandic. Some speakers accept or in some cases prefer default agreement over agreement with nominative objects, though Sigurðsson (1996) reports that agreement with the nominative object is obligatory for "most" speakers and most verbs. I return to some additional considerations in Section 10.6.

stands in contrast to the familiar nominative–accusative alignment, as shown in (16a). See Dixon (1994).

(16) a. Nominative–Accusative b. Ergative–Absolutive





Despite the different groupings for case marking, it is well established that many diagnostics that one may be tempted to consider as subject–object asymmetries work in the same way across the language types, treating A and S as a natural class of "subjects", as distinct from O. According to Dixon (1994), some grammatical processes universally target subjects. These include "subject-orientation" of reflexives, imperatives, and Control phenomena (cf. Section 10.2.2). In other words, while there is quite a bit of apparent syntactic variation among individual languages, there has been little success in showing that the syntax of subjects/objects is systematically different in a way that is correlated with ergativity.[12] By definition, then, ergative case systems constitute a case–GF mismatch.

Now, it turns out that implicational universals of the kind that motivated the Moravcsik Hierarchy are also attested in ergative languages. Some patterns of agreement are simply unattested. This is summarized in (17), cf. (12).[13]

(17)	a.	no agreement	(Dyirbal, Lezgian)	e.	*ERG only
	b.	ABS only	(Tsez, Hindi)	f.	*ERG DAT, not ABS
	c.	ABS ERG	(Eskimo-Inuit, Mayan)	g.	*DAT only
	d.	ABS ERG DAT	(Basque, Abkhaz)	h.	(*ABS DAT, not ERG)

Important here is the absence of type (e) languages, as compared to types (b) and (c). That is, alongside the valid implication in (18b), which holds of

[12] The one apparent case of a systematic difference is in accessibility for relativization (Keenan and Comrie 1977). While not all languages have an asymmetry, if there is one, then it is absolutives that are more readily extractable than ergatives (in ergative languages), while elsewhere, subjects are more extractable than objects. It is not clear to me how the Keenan and Comrie hierarchy and the Moravcsik hierarchy might be related.

[13] See Murasugi (1994: 147), Croft (1990), Woolford (1999). The absence of type (h) is inferred from these sources, though not explicitly stated there. A complicating factor is that there are also "split" systems. One split type has an ergative–absolutive case system alongside a nominative–accusative (=subject–object) agreement system; the reverse is unattested. This split follows from the proposals advanced here, see Section 10.4.3.

non-ergative languages and is directly encoded in (11), the implication in (18a) is equally valid, yet is not encoded in the Moravcsik Hierarchy.

(18) a. ERG agreement → ABS agreement

b. OBJ agreement → SUBJ agreement

Thus, (11) appears to miss a significant generalization. Though the typological gap is known, presentations such as Croft (1990) simply state two hierarchies, the special hierarchy in (19a) holding for Ergative languages, that in (19b) holding for nominative–accusative ones.

(19) a. Absolutive > Ergative > Dative

b. Subject > Object > Indirect Object

Note that the two hierarchies are stated in non-like terms, the one in terms of m-case, the other in terms of GF. Particularly suspicious is that the formulation in terms of case is necessary precisely for that class of languages in which case and GF do not coincide. This leaves the range of the GF hierarchy as only those languages where case and GF (largely) coincide. This state of affairs invites a reformulation of (19b) in terms of case categories so that the hierarchies are now more directly comparable, as in (20).

(20) a. Absolutive > Ergative > Dative

b. Nominative > Accusative > Dative

At this point, the relevance of the case groupings suggested by Marantz (1991) should be apparent. For Marantz, ergative and accusative are the *dependent cases*, assigned only in the presence of a local case competitor (cf. Bittner and Hale 1996, McFadden 2004), while nominative and absolutive are names for the unmarked case. Thus, in terms of Marantz's categories in (9), the two hierarchies in (20) are in fact one and the same hierarchy, namely that given in (13), repeated here.

(13) Unmarked Case > Dependent Case > Lexical/Oblique Case

A clear advantage of this reformulation is that the two implications in (18) now both follow automatically from (13). Indeed, both are exactly the same statement, namely that if a language has agreement with dependent case NPs, then that language will also have agreement with default case NPs.

Of course, the unification of the two hierarchies in (20) was predicated on the assumption that there is a rigid equivalence, for nominative–accusative languages, such that nominative:subject :: accusative:object. While this is *largely* correct, it isn't *entirely* correct. As we have seen in the preceding section, the correspondence between case and GF breaks down in Icelandic. Yet as we have also seen, exactly where the correspondence breaks down, it is case and not GF that determines accessibility for agreement.

10.4 First among equals: multiple accessible NPs

In the languages considered to this point, the calculation of accessibility (unmarked m-case) normally returns a unique NP in any given clause (i.e., agreement domain).[14] This is not always the case; in some languages, situations arise in which there is more than one accessible NP in a given domain. In such cases, it is the highest accessible NP that controls agreement. Multiple accessible NPs in a single domain may arise in one of two ways. On the one hand, there are situations in which more than one NP may receive unmarked m-case. This arises in languages like Hindi, which has stricter conditions on the distribution of dependent cases than are given in (9), see below. On the other hand, there are single agreement languages in which more than one m-case is accessible. I argue below that the second case is instantiated by Nepali, as described by Bickel & Yādava (2000). In Section 10.4.3, I demonstrate that this second possibility yields a straightforward account of a known typological gap in split ergative systems.

The discussion throughout this section also highlights two ways in which the predictions of (3) differ from other conceivable approaches. First, the metric "highest" is subsidiary to accessibility, defined as above. NPs that are not accessible are simply invisible for the computation of agreement controller (contrast "defective intervention" of Chomsky 2000: 123 and related work; see Section 10.6 below). Second, although accessibility in a given language is defined in terms of a markedness hierarchy (13), the hierarchy itself plays no further role in the synchronic grammar of any languages. This contrasts with approaches such as OT in which the hierarchies are fundamental parts of synchronic grammar. I return to this point briefly at the end of Section 10.4.2.

[14] In the normal case, but see van Koppen (2005), who argues that in cases of coordinated NPs (and certain other contexts) the coordinated NP as a whole as well as the individual conjuncts may share m-case and thus all be accessible. Van Koppen argues that the calculation of highest/closest sometimes fails to return a unique controller, for example, allowing the conjoined NP and its first conjunct to be equally accessible and local. She presents evidence from an impressive array of Dutch dialects that in these cases, considerations of featural markedness in morphology resolve the choice of controller. Koopman (2005) also uses instances of locality failing to return a unique controller to develop an alternative account of the Tsez facts discussed in Section 10.5, below.

10.4.1 *Hindi-Urdu: Highest unmarked*

Indo-Aryan languages provide another range of examples that echo the refrain in (14), namely that it is m-case and not GF that provides the accurate predictor of accessibility. The Indo-Aryan languages add some interesting ingredients to the mixture, not seen in the preceding sections. For one, these languages are described as having a (type of) split-ergative system, in which ergative and accusative may occur in the same clause. This fact alone questions an approach that would maintain separate hierarchies for ergative and nominative languages: which one would a clause having an ergative and an accusative be expected to adhere to? More to the point, although accessibility does not pick out a unique controller in some contexts, in actual fact only a single NP in any given environment can be the controller of agreement. The deciding factor that resolves the competition among accessible NPs, as has been noted before, is structural prominence: the highest accessible NP "wins".

Hindi-Urdu displays this pattern straightforwardly. The facts are widely discussed, so I provide only a cursory discussion here. As noted by Kachru et al. (1976) and in more detail in Mohanan (1994), agreement in Hindi-Urdu is readily described as being with the highest caseless (i.e., nominative) NP argument in the domain of the finite verb.[15] The basic case system of this language involves two overt affixes ("dative" -*ko*, and "ergative" -*ne*). The ergative is used to mark external arguments of transitive (and some unergative) predicates, but only in the perfective tense/aspect. The dative is used to mark experiencers and goals (including experiencer subjects), and is also used to mark specific or animate direct objects. Remaining core arguments are unmarked. Laying aside ditransitives, this yields five basic patterns, as shown below. The boldfacing indicates the argument that triggers agreement on the verb.

(21)	Perfective:	a.	SUBJ-ne	**OBJ-Ø**	V	
		b.	SUBJ-ne	OBJ-ko	V	**default**
	Imperfective:	c.	**SUBJ-Ø**	OBJ-Ø	V	
		d.	**SUBJ-Ø**	OBJ-ko	V	
	Psych:	e.	SUBJ-ko	**OBJ-Ø**	V	

[15] Some interesting questions arise in the determination of domains. Under certain conditions, the matrix verb may agree with the nominative object of an embedded infinitival complement. See Bhatt (2005) for a comprehensive discussion, and Polinsky (2003) and Bobaljik and Wurmbrand (2005) for evidence that restructuring (i.e., "clause union") infinitival complements form part of the matrix agreement domain quite generally. Note also that only surface argument NPs are relevant to the determination of agreement, thus as a reviewer notes, incorporated NPs are formally caseless, but do not agree. As is true in many languages, clauses with an incorporated direct object are formally intransitive (Mohanan 1995) and thus presumably lie outside the case system. Recall that the framework adopted here allows a distinction between caseless NPs and NPs bearing unmarked case.

The following examples illustrate the above schema.[16]

(22) a. raam-ne **roṭii** khaayii thii
Ram-ERG (MASC) **bread-Ø (FEM)** eat.PF.FEM be.PST.FEM
"Ram had eaten bread."

b. siitaa-ne laṛkii-ko dekhaa
Sita-ERG (FEM) girl-ACC (FEM) see.PF.MASC
"Sita saw the girl."

c. **siitaa** kelaa khaatii thii
Sita-Ø (FEM) banana-Ø (MASC) eat.IMPF.FEM be.PST.FEM
"Sita (habitually) ate bananas."

d. **niina** bacce-ko ut^{h}aayegii
Nina-Ø (FEM) child-ACC lift.FUT.FEM
"Nina will pick the child up."

e. siita-ko **laṛke** pasand the
Sita-DAT (FEM) **boys-Ø** like be.PST.MASC.PL
"Sita likes the boys." (Woolford 1999)

The examples just given show how agreement reliably tracks unmarked case. NPs bearing an overt case marker never control agreement, and the argument controlling agreement may be either subject or object. Once again, we find a mismatch between case and GF, and it is morphological case, not GF that determines which NP will control agreement. Further, as the (b) examples show, if both subject and object are overtly marked for case, then no argument controls agreement and a default form (3SG.MASC) is used, as in Icelandic. The interesting case is (c). In this configuration, there are two argument NPs with unmarked case, and it is the higher one that controls agreement. Such a situation does not arise in canonical ergative systems or in Icelandic. These configurations thus motivate the restriction to "highest" in the formulation of the hypothesis in (3). Crucially, "highest" is subordinate to accessibility. The formulation "highest NP, if accessible" would fail for (21a,e), just as it would for nominative object agreement in Icelandic.

10.4.2 *Nepali: Markedness*

Next consider the related language Nepali, for which I rely exclusively on the discussion in Bickel and Yādava (2000), henceforth B & Y. B & Y claim that while Hindi-Urdu shows the need to refer to m-case in determining the

[16] The gender of a noun is not morphologically expressed on that noun, but is indicated in parentheses in the gloss. Masculine agreement is default, so only feminine marking on the predicate is a clear indication of a morphological agreement relation.

controller of agreement, Nepali shows the need to appeal to GF. Specifically, B & Y claim (p. 347):

(23) "Where there are two nominative NPs in a Nepali clause, agreement is with the higher argument, just as in Hindi. Unlike in Hindi, however, there is no agreement with nominative objects. Instead, the verb agrees with the ergative A-argument."

To support this B & Y give (24), where agreement is with the first person subject regardless of case.

(24) a. ma yas pasal-mā patrikā kin-ch-u
1SG.NOM DEM.OBL store-LOC newspaper.NOM buy-NPST-1SG
"I buy the newspaper in this store."

b. maile yas pasal-mā patrikā kin-ē
1SG.ERG DEM.OBL store-LOC newspaper.NOM buy-PST1SG
(*kin-yo)
buy.PST3SG.MASC
"I bought the newspaper in this store." (B & Y: 348)

Note, though, that this pair alone does not suffice to argue for a (uniquely) GF-based definition of accessibility, even in Nepali. Consider the consequences of positing a parametric difference in m-case accessibility between the two languages, as in (25).

(25) $\underbrace{\underbrace{\text{Unmarked Case}}_{\text{Type 1 (Hindi)}} > \text{Dependent Case}}_{\text{Type 2 (Nepali)}} > \text{Lexical/Oblique Case}$

By hypothesis, Nepali would differ from Hindi-Urdu in including dependent case (ergative) among the accessible cases. Under (13), this entails (correctly) that the unmarked case must also be accessible. Moreover (3) yields exactly the pattern described in (23) and (24)—the highest accessible argument in (24a) is the subject, as in Hindi-Urdu, but unlike Hindi-Urdu, the highest accessible NP in (24b) is also the subject, even though it bears ergative case. This proposal captures the data in (24), yet contrary to the quote in (23), the proposal here predicts that nominative objects in Nepali should in fact control agreement, but only when the subject bears an inaccessible case. According to the data presented in B & Y, this is in fact the case. Although they claim that nominative objects do not agree, they give the example in (26) to illustrate the fact that, like in Hindi, dative subjects do not agree. In exactly this environment, as predicted, the highest accessible NP is the nominative object, and, indeed, it agrees, just as in Hindi (21e).

(26) malāī timī man par-ch-au
1SG.DAT 2MASC.HON.NOM liking occur-NPST-2MASC.HON
(*par-ch-u)
occur-NPST-1SG
"I like you." (B & Y: 348)

On the (not uncontroversial) assumption that the dative subjects are subjects, the Nepali facts are thus consistent with the proposals advanced above, and in particular with the claim that all languages respect the m-case hierarchy in determining accessibility of NPs for agreement. GF is never directly referenced, and apparent subject-orientation cutting across case distinctions arises only to the extent that highest accessible in (3) converges with subjecthood. Note importantly that the calculation of "highest" is always subsidiary to accessibility, and thus apparent subject-orientation is still limited by accessibility: in Nepali, unmarked and dependent case subjects are accessible, but oblique subjects are not.[17]

The Nepali data brings out another way in which the proposal here differs from conceivable alternatives. Specifically, the proposal here is that the markedness hierarchy in (13) defines legitimate groupings of m-cases into accessible and inaccessible (in no language can dependent cases be accessible and unmarked case inaccessible). The hierarchy plays no further role, and, in particular, no role in the competition among accessible NPs in a given sentence. Thus in Nepali (24b) it is the highest of the accessible NPs (the ergative) that controls agreement, even though there is a sense in which the object is less marked. The view here thus contrasts with proposals in OT frameworks, where the markedness hierarchy would be directly encoded in the constraints that determine agreement controller in any given sentence. While the right ranking could be found for Nepali, the OT-like system would lead one to expect languages in which it is the "least marked" NP that controls agreement. This would play out as a language in which dependent cases only control agreement when there is no available unmarked NP in the clause. I am aware of no agreement system that conforms to this expectation, and thus retain the view advocated in this chapter.[18]

[17] Other languages have been analyzed as requiring reference to GF as well as case, especially within the RG literature. Most of these are from languages showing complex agreement—agreement with more than one argument on a single verb. I have declared such systems to be beyond the scope of the current discussion, but the hypothesis here will fail if an account in terms of m-case plus hierarchical structure is not forthcoming. I believe this to be feasible, but cannot address the matter here.

[18] My thanks to Paul Smolensky for raising this question.

10.4.3 *Ergative splits: A typological gap*

The discussion of Hindi-Urdu in Section 10.4.1 examined the case and agreement facts in one language that shows a split-ergative system. As mentioned in note 13, there is another type of split that is crosslinguistically well-documented and is directly relevant to the present proposals. In some languages, the case and agreement systems within a single language follow different alignments. Intriguingly, this happens in only one direction. There are languages in which the case system is ergative, but the agreement system can be called nominative–accusative (Warlpiri and Chukchi are examples of this type). The converse (ergative agreement with nominative–accusative case) is generally held to be unattested (Dixon 1994, though see Patel 2006 for an apparent counterexample). This typological gap receives a principled explanation within the framework advanced here, although considerations of space permit only the briefest sketch.

In the preceding section, the difference between Hindi-Urdu and Nepali was explained by ranking the languages at different points on the m-case accessibility hierarchy, as in (25). As it happens, in the normal case this distinction will only manifest itself empirically in languages with an ergative case system. Here's why.

The main hypothesis of this chapter is that agreement is always dependent upon accessibility, defined in terms of m-case. When only one case type is accessible, agreement will visibly track the morphological case system (in as far as zero exponents do not obscure this). Nominative–accusative systems will have a nominative-based agreement system, while ergative systems will have an absolutive-based agreement system. These are simply two names for the same thing, namely, unmarked case. However, consider now Type 2 languages in (25), those in which dependent case is also accessible. In a nominative–accusative case array, nothing changes. The nominative subject will always be the highest accessible NP, whether or not the accusative is (in principle) accessible. So a nominative–accusative case array will always yield a nominative–accusative (=subject–object) agreement alignment. But in ergative–absolutive case arrays, the difference between Type 1 and Type 2 means a difference precisely in whether the transitive subject is accessible for agreement. In a Type 2 language like Nepali, the highest accessible NP will be the subject of transitive and intransitive clauses alike, despite the fact that this cross-cuts the ergative–absolutive case system. This characterizes exactly the attested split: an ergative–absolutive case array but a nominative–accusative (really, subject–object) agreement alignment. Given the proposals in this chapter, there is simply no way to derive the unattested split. This is summarized in (27).[19]

[19] Legate (2005a), responding to an earlier draft of this chapter, is thus in error when she claims that the system presented here cannot cover the attested case-agreement splits. In fact, as just demonstrated,

(27) PREDICTED AGREEMENT ALIGNMENTS

	Accessible case(s)	
Case Alignment	Unmarked	Unmarked and Dependent
Ergative–absolutive	absolutive (vs. ergative)	subject (vs. object)
Nominative–accusative	subject (vs. object)	subject (vs. object)

10.4.4 *Summary*

In this section, I have presented evidence that accessibility alone does not always yield a unique NP for the controller of agreement. In such cases, as recognized in the prior literature, structural prominence (a form of relativized locality) determines the controller of agreement. On the perspective advanced here, this is the only role for relativized locality (intervention). This view correctly accounts for the phenomena discussed above including the exclusion of a known typological gap.

10.5 Close enough: agreement without checking

At this point, I turn to a discussion of Long-Distance Agreement (LDA) constructions, in which the matrix verb agrees with an NP in an embedded clause. LDA constructions have been identified in a variety of languages; I illustrate here with data from Tsez (Daghestanian), one of the most carefully documented of such configurations.[20] Specifically, these constructions show that the choice of agreement controller is determined by morphological accessibility and locality but not by any other designated syntactic relationship. An NP that bears no syntactic relation to a verb nevertheless may control agreement on that verb, by dint of simply being the highest accessible NP

the attested patterns, and only the attested patterns, are statable within the system. However, Legate does note a language type which the proposals here do not account for, namely, a language in which the only NPs that trigger agreement are subjects bearing unmarked case, i.e., a language in which marked subjects and unmarked objects (in the presence of a marked subject) fail to agree. Such a pattern could be exemplified by a language with an ergative–absolutive case alignment but in which only intransitive subjects govern agreement, while object absolutives do not. Legate suggests that Nieuean is such a language. I suspect that this is more properly analyzed as a case of verbal number (see note 10), which is independently attested in Austronesian languages, thus I maintain (pending further investigation) that such languages are indeed unattested.

[20] The Tsez data and analysis reported here are taken from Polinsky and Potsdam (2001), henceforth P & P. Other languages with constructions similar to Tsez in relevant respects include Passamaquoddy (Bruening 2001) and Innu-aimûn (Branigan and MacKenzie 2002). See Polinsky (2003) for a survey of LDA.

in the verb's domain (as in (3)). Such configurations challenge theories in which agreement is more closely wedded to the narrow syntax, whether tied to feature-checking relations (e.g., "abstract case", as in GB/MP) or to argument structure/subcategorization (as in GPSG, LFG, and HPSG, see Bresnan and Mchombo 1987, Pollard and Sag 1994, Kathol 1999). While the main point of the discussion of LDA here is this "close enough" effect, the discussion of Tsez will also illustrate the role of domains, that is, the absolute locality condition in (3) (see also Bobaljik and Wurmbrand 2005).

10.5.1 *LDA in Tsez*

Tsez is a single-agreement language with an ergative case system. Hence, only absolutive (i.e., unmarked) NPs are accessible for agreement—in simple clauses the intransitive subject or the object of a transitive verb, as expected. However, under a certain constellation of conditions, an absolutive NP in a finite embedded clause may control agreement on the matrix verb. Example (28) illustrates. The object of the matrix transitive predicate "know" is the entire embedded clause. The matrix verb may agree with this clausal object, signalled by the class IV agreement prefix, *r*-. Alternatively, the verb may show the class III agreement prefix, displaying LDA with the class III absolutive NP in the embedded clause.

(28)	enir	[užā magalu	b-āc'rułi]	r-/b-iyxo
	mother	boy bread.ABS (III)	III-ate	IV-/III-know

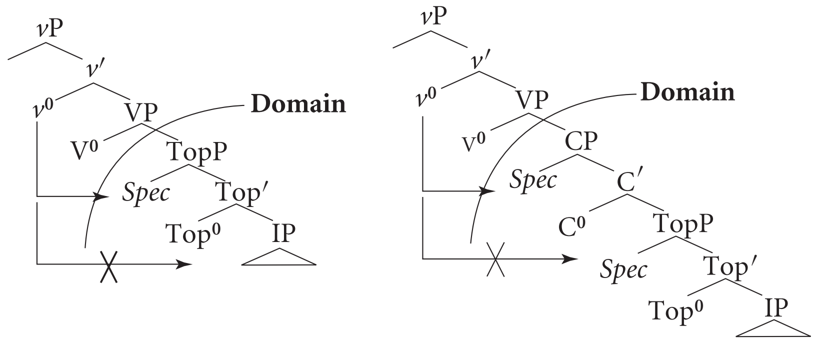
"The mother knows [(that) the boy ate the bread]." (P & P, 584)

Whatever matrix agreement is chosen, the embedded clause is finite, and the embedded absolutive governs agreement in its own clause. There is thus no reason to suspect that LDA is driven by the needs of the embedded absolutive. Indeed, P & P argue extensively that the agreeing element in the embedded clause remains in the embedded clause at every level of representation, including LF. Although Tsez does provide evidence for covert movement (QR), P & P show that both overt and covert movement are strictly clause-bounded in Tsez. P & P are also careful to establish that the LDA version of (28) does indeed exhibit agreement across a clause boundary. That is, they give arguments against a prolepsis or "proxy agreement" analysis, under which the actual trigger of matrix agreement is a (phonetically null) NP (the proxy) in the matrix clause, coreferent with the relevant NP in the embedded clause. A rough paraphrase of what a proxy analysis might look like is given in (29).

(29) I know about/of it/the bread$_i$ [(only) that the boy ate it$_i$].

P & P's analysis of LDA in Tsez is sketched in (30a).

(30) a. Agreement with SpecTopP b. Agreement with SpecCP/*SpecTopP



This analysis has two key components. First, P & P suggest that topics in Tsez may undergo (possibly covert) fronting to a functional projection, TopP, above IP (but below CP, if present).[21] Second, P & P propose that agreement is constrained by a locality condition that leaves room for the highest specifier of one domain to be accessible to the next higher domain (compare *Proper Government* in ECM constructions, or analogously, the special exception to the *Phase Impenetrability Condition* for phase *Edges* in Chomsky 2000). Together, these assumptions account for the key properties of the LDA configuration in Tsez, in particular, those in (31).

(31) a. no absolutive NP in matrix clause
b. embedded NP must be the (primary) topic of its clause
c. no CP projection (*wh*-words, complementizer)

Condition (31a) is the result of the familiar relativized locality condition (as discussed in Section 10.4). An absolutive NP in the higher clause will be closer to the matrix verb than an embedded NP, blocking LDA. Condition (31c) reflects the domain effect. When there is overt evidence for a CP projection in the embedded clause (either a complementizer or a *wh*-phrase), then the specifier of TopP is no longer the highest projection, and an absolutive topic is inaccessible to LDA, as shown in (30b). At the same time, the domain effect predicts that a *wh*-word in the embedded clause (the specifier of CP) will be itself a potential controller for matrix agreement, if that word satisfies

[21] Note that this requires a model in which agreement in the higher clause sees the LF representation of the lower clause. This is true of the model of grammar in (2b), see footnote 1, and of other strongly cyclic models, such as that of Nissenbaum (2000), where covert movement follows overt movement within any one phase (e.g., clause), but all movement (overt and covert) in the lower phase occurs before operations in the higher phase begin.

other conditions on agreement, including m-case accessibility. The available evidence, though tenuous, bears this out (P & P, 638, n. 20).

Finally, the P & P analysis captures the condition in (31b), reducing the topic restriction to a familiar type of structural locality. Only (primary) topics undergo movement to the specifier of TopP in the embedded clause, hence only topics are ever accessible to LDA (and then, only when morphological accessibility and minimality are respected).[22] Note in particular that topichood is a condition on absolutive NPs that undergo LDA, but is not a general condition on agreement in Tsez. Clausemate agreement is triggered by topic and non-topic NPs alike. This contrast emerges especially clearly with NPs that cannot be interpreted as topics (such as focused/marked NPs, non-referential NPs, and the subjects of thetic sentences). These NPs trigger local (clausemate) agreement but cannot participate in LDA (P & P, 611ff).[23]

In sum, Tsez quite neatly illustrates the "close enough" effect that is expected once it is recognized that agreement is not the expression of any particular syntactic dependency. There is no argument for any relation between the matrix verb and the NP it agrees with in LDA configurations other than that the NP is accessible (absolutive m-case) and that it is *close enough* to (highest accessible NP in the domain of) the matrix verb.

10.5.2 *Domains for LDA: An aside*

In this chapter, I have assumed two facets of locality, one relativized (highest), the other absolute (domains). This is a familiar distinction from GB,

[22] The restriction to primary topics (P & P, 610) covers cases in which there is more than one topic in the embedded clause. Even if the absolutive NP is topical, it will fail to govern LDA if there is another NP in the clause, such as an overtly fronted or topic-marked expression, that is the primary topic. That primary topic will "use up" the unique specifier of TopP that is accessible to the next higher domain, preventing an absolutive NP, even if topical, from occupying that position (regardless of whether secondary topics remain in situ or move to some lower position—Polinsky 2005). P & P leave as an apparently open problem (p. 639) the fact that an overtly marked nonabsolutive topic will block LDA, even if that topic is lower than the absolutive NP, but leaving this open appears to have been an oversight, as the issue does not arise if an element bearing topic marking is obligatorily the primary topic.

[23] This last fact is relevant for theories that invoke percolation or cyclic agreement to treat the Tsez facts (see Frank 2005 and Legate 2005b). On these approaches, the embedded predicate agrees with the absolutive NP, the features percolate to the maximal projection of the predicate (i.e., the clause), and the matrix predicate then agrees with the embedded clause. LDA does not cross a clause boundary, but involves two local steps of agreement. There is no morphological evidence to support this in Tsez: recall that LDA is restricted to topics, but the embedded predicate agrees with the absolutive NP whether it is a topic or not. Some additional mechanism must be postulated to block the morphologically manifest features from being percolated up when they are from a non-topic. Space limitations prohibit a careful engagement with these alternatives.

carried over into MP (via Phases). Just as in earlier discussions of this disjunctive approach to locality (Chomsky 1986), it is certainly worth asking whether domains might be reduced to a special case of relativized locality (intervention). For example, given that a CP may in fact be an agreement controller, that CP might count as closer/higher (to the matrix verb) than anything contained in it (see van Koppen 2005, Bošković 2006 for proposals along these lines). If all domains (and no other maximal projections) count as interveners, then the domain condition could be reduced to a special case of minimality/intervention, and (3) could be simplified accordingly. However, at the current state of understanding, there are several empirical hurdles that such a direction faces, especially as concerns LDA.

In the first place, the best evidence to date is that (30a) (clausemate, plus the specifier of TopP) represents the maximal distance that agreement between a verb and an NP may span, crosslinguistically. There are no clear cases in the literature of agreement reaching deeper into a finite clause than to the primary topic of that clause, regardless of the overt position of that topic.[24] Various putative examples have been cited to the contrary, in particular from Algonquian languages (including Blackfoot, Cree, and Fox, related to Passamaquoddy and Innu-aimûn mentioned in n. 20) and from the Chukotkan languages Alutor and Chukchi. However, for each of these languages, there is evidence in favor of a proxy agreement analysis (cf. (29)) and for none of the languages has any evidence been presented that the agreement controller is actually in a finite clause.[25]

[24] LDA into non-finite clauses appears to be a case of restructuring or clause-union (Polinsky 2003, Bhatt 2005, Bobaljik and Wurmbrand 2005), in which the infinitival complement and its selecting verb are known to form a single domain for the purposes of many otherwise clause-bounded phenomena. The authors just cited follow Wurmbrand (2001) and prior work in assuming that the infinitival complements of restructuring verbs (i.e., those that allow LDA) are VP complements and not full clauses. This may be relevant to putative "defective intervention" cases in Icelandic, see Section 10.6 below.

[25] See Polinsky (2003) for discussion of Blackfoot, Cree, and Fox. For Alutor, Mel'čuk (1988), the original source of the only example presented, provides a proxy agreement alternative along with an argument for that alternative as against LDA. The Chukchi example that is cited in this regard (most recently in Chomsky 2004, n. 25, and Bošković 2006, originally from Inènlikej and Nedjalkov 1972: 182) is given in (i) (the gloss has been added partly on the basis of Skorik 1977 and Dunn 1999; "-E-" represents an epenthetic vowel, "3 > 3" is a portmanteau agreement morpheme for third person subject and object; the paraphrase translates the Russian original).

(i)	ənan	qəɬɣiɬju	ɬəŋ-ə-rkən-in-et,	iŋqun	rətəmnev-nen-at	qora-t
	he.ERG	sorry/pity/regret	AUX-E-PST-3 > 3-PL	because	lose-3 > 3-PL	reindeer-PL

"He feels sorry (for them) that he lost (them) the reindeer."

Although Inènlikej and Nedjalkov (1972) mention this as a case of LDA, in which the matrix light verb (used transitively to create predicates of emotion) agrees directly with the embedded plural object, there are at least four reasons to doubt this interpretation and to consider a proxy agreement analysis as suggested by their paraphrase. In addition to the absence of an intervention effect from

In addition, a straightforward minimality/intervention account makes strikingly incorrect predictions for each of the languages mentioned. In all of these languages, subjects are accessible for agreement (and do trigger agreement in their own clauses), yet in each case, putative LDA may "skip over" the subject and agree with some lower expression, such as the direct object.[26] As Polinsky (2003) notes, the absence of intervention effects in apparent LDA configurations is precisely what is expected under a proxy agreement account, but appears to lead to a contradiction on the hypothesis that all locality should be reduced to intervention effects. Thus, although the main conclusion of this chapter would be unaffected if domains reduce to intervention, and (3) arguably simplified, the facts as currently available do not seem to bear out such a reduction (see also Section 10.6).

10.6 Icelandic yet again

Before closing, I turn to one final point on which the conclusions reached above differ from some current theoretical proposals, specifically, the role of inaccessible NPs in the computation of agreement. While I hold that such NPs are irrelevant to the computation of locality, an alternative view takes these NPs to induce a "defective intervention" effect, apparently as a parametric option. Such an effect is supposed to arise in Icelandic as follows. The dative NP cannot control agreement on the verb, but seems to *intervene* to block agreement with a lower potential controller. This arises in the configuration in (32a) (where left-to-right order reflects c-command). That it is the dative that is blocking agreement is indicated by the curious fact that for some, but not all, types of movement, the trace of the dative no longer intervenes (32b).[27]

the embedded subject (see main text below), these include: the choice of complementizer (normally glossed as "because" or "in order to," rather than declarative "that"; see Skorik 1977); the properties of the transitive light verb construction of emotion (which normally takes a DP object, to judge by the definition in Moll and Inènlikej 1957, see also Dunn 1999); and the word order of the putative embedded clause, which should normally be SOV for a clausal complement (M. Polinsky, p.c.). At the very least, since *qəɬɣiɬju ɬəŋ-ə k* does take DP objects, and since adjuncts with *iŋqun* "because" are possible, under the available descriptions of Chukchi the proxy configuration is expected to be a legitimate parse of this sentence. Additional evidence would have to be brought to bear to motivate an analysis that treats (i) as ambiguous, with LDA as a second reading. My thanks to Masha Polinsky for sharing her expertise on Chukchi.

26 In fact, the putative controller of matrix agreement on a domain-free LDA account can, paradoxically, be an NP that is not eligible to control normal agreement, such as an NP in adjunct position. Polinsky (2003) identifies such examples from Blackfoot and Fox. Of course, on a proxy agreement account, these NPs are related to the (null) controller of agreement via an anaphoric relation, and thus these examples pose no problem.

27 The situation is more complex in a variety of ways. Among other restrictions (see Holmberg and Hróarsdóttir 2003), nominative objects cannot be first or second person. Following Taraldsen (1995), this is sometimes also described as an intervention effect, incompatible with the theory developed here

(32) a. V/AUX … DAT … NOM ⇒ constrains agreement with NOM
b. DAT V/AUX … t_{DAT} … NOM ⇒ Agreement OK

The data originally discovered to show such an effect (Watanabe 1993: 417ff., extended in Schütze 1997: 107ff.) involve embedded quirky dative subjects, as in (33).

(33) a. Mér ?*virðast / virðist [Jóni vera taldir *t* líka
Me.DAT seemed.PL/SG Jon.**DAT** be believed.PL like
hestarnir.]
horses.NOM
"I perceive Jon to be believed to like horses."

b. Jóni virðast / ?*virðist [*t* vera taldir *t* líka hestarnir]
Jon.DAT seemed.PL/SG be believed. PL like horses.NOM
"Jon seems to be believed to like horses." (Schütze 1997: 108–9)[28]

In (33a), the matrix predicate has a dative experiencer subject. The lower predicate also has a dative experiencer subject; the configuration in (32a) obtains and agreement between the matrix verb and the embedded nominative is blocked. In (33b), the matrix predicate does not take an experiencer. In this configuration, the embedded subject (quirky or not) may move to the matrix clause. (It can be shown that the embedded subject undergoes raising, although this particular example does not exclude the possibility of long-distance V2 topicalization, a recurring confound in the available data.) In contrast to (33a), agreement in (33b) between the matrix verb and the embedded nominative is permitted, across the trace of the dative, arguably instantiating the configuration in (32b).

This effect provides two related challenges for the view of agreement I am espousing here. First, the nominative NP in (33b) must be in the domain of the

(see Anagnostopoulou 2003, Béjar 2003, and Boeckx 2000). On this approach, the verb first attempts to agree with the dative NP but agreement fails. There is then a second attempt to agree which is by hypothesis restricted only to third person NPs, which lack a person feature. To account for the facts, this requires the additional stipulation that first and second person nominatives must agree: despite confusing wording in some accounts, "partial agreement" (i.e., agreement in number, but not person) is not an option. Note, though, that the restriction on nominative objects to third person holds also in infinitives (as in (i), see also Boeckx 2003) where there is no agreement, suggesting that the restriction is not tied to morphological agreement.

(i) Við vonumst til [að leiðast hún /* þið ekki]
we.NOM hope.PL for to bore.INF she.NOM / you.PL.NOM not
"We hope not to be bored with her/*you." (H. Thráinsson, p.c.)

[28] Schütze attributes these judgments to H. Thráinsson, but notes that some speakers allow a singular matrix verb in the (b) example.

matrix T/V, since agreement is acceptable. Second, taking the pair together, it appears that the failure of agreement in (33a) should thus be attributed to the position of the dative. Yet such a characterization of the effect is not readily compatible with (3). By (3), a given NP should be accessible or inaccessible, depending on its m-case, and, if inaccessible, should be invisible. There are at least two alternatives that one might entertain within the general framework I have suggested, neither of which needs to resort to defective intervention as a constraint on agreement.

The more promising alternative, it seems to me, is to assume that it is not the embedded quirky dative, itself, that is the intervener in (33a), but rather that the position of the dative is indicative of the presence of a domain boundary in that example that is not present in (33b). Nomura (2005) presents an analysis of the facts in (33) in part along these lines, extending proposals from Wurmbrand (2001) for restructuring (see also Koopman 2005). Wurmbrand provides substantial evidence that infinitive complements in German and other languages may contain more or less hidden (functional) structure, in a manner that captures the restructuring/non-restructuring (coherent/incoherent) divide. Importantly, one and the same verb may take either a restructuring (less structure) or non-restructuring (more structure) complement, in the absence of any particular morphological signal of that distinction. However, as shown in Bobaljik and Wurmbrand (2005) and Polinsky (2003), only restructuring infinitives are transparent for domain-based processes such as agreement. If it can be maintained that *seem* without an experiencer is a restructuring predicate, while *seem* with an experiencer is a non-restructuring predicate, then a domain-based account of (33) would be relatively straightforward, with no appeal to argument intervention.

Support for a domain-based characterization of the facts comes from the observation that there is a strict division between monoclausal and biclausal constructions as regards the distribution of putative intervention effects. Contrary to the view that has gained currency in narrowly Minimalist proposals (such as Boeckx 2003),[29] there is no evidence that defective intervention effects are a general reflection of the configuration in (32). Rather, such effects arise only in biclausal constructions. Agreement with the nominative object in monoclausal environments that reflect (32a) is always possible, and generally obligatory (as noted independently by Koopman 2005). Relevant examples from the standard literature were given in (4b,d); additional examples are given in (34).

[29] "[F]inite verb agreement with the nominative object is excluded if a Quirky element is within the c-command domain of the verb at Spell-Out ('surface structure')." (Boeckx 2003: 1).

(34) a. Það voru konungi gefnar ambáttir í vettur
EXPL were.PL king.DAT given slaves.NOM in winter
"There was a king given maidservants this winter." (ZMT, 112–113)

b. Það voru einhverjum gefnir þessir sokkar
EXPL were.PL someone.DAT given.PL these socks.NOM
"Someone was given these socks." (JGJ, 153)

The effects in (33) arise only when the verb and the nominative are in different clauses. Even recognizing variation reported in the literature, apparent defective intervention does not arise in monoclausal configurations. This alone should suggest a domain-based, rather than an intervention-based, account of the facts.[30]

While I now suspect that the domain-based (restructuring) alternative is the most promising account of the apparent intervention effect, there is one tantalizing piece of evidence suggestive of a (covert) movement-based alternative, relating the effect in (33) to a known constraint on overt A-movement in Icelandic, and, again, with no appeal to defective intervention as a constraint on agreement. Such an account begins with the observation that overt A-movement is order preserving (see Sells 1998, Williams 2000, Anagnostopoulou 2003, Fox and Pesetsky 2005). This can be illustrated with

[30] Holmberg and Hróarsdóttir (2003) and, following them, Hiraiwa (2005) and Nomura (2005), present a more nuanced view than does Boeckx, as just cited. For Holmberg and Hróarsdóttir, the key relation is between T^0 and the nominative (see also Chomsky 2004). For (4) and (34), they might assume that the dative occupies the specifier of TP, with the surface word order the result of V2 movement of the verb to C^0. Under this view, T^0 (or its trace) follows the dative in examples like (4) and (34) and thus, despite the surface word order, the dative does not intervene between T^0 and the nominative. This perspective fails to discriminate between the acceptable (4) and (34) on the one hand, and the key examples of intervention that Holmberg and Hróarsdóttir give, in (i)–(ii), on the other. To the extent that raising of the dative to the specifier of TP is allowed for the dative subjects in (4) and (34), the same raising to the specifier of TP must be recognized for the dative subject in (i). Hence, on their account, the contrast between monoclausal and biclausal constructions is simply not expected.

(i) Það *virðast / virðist einhverjum manni [hestarnir vera seinir]
EXPL seem.PL/SG some man.DAT the horses.NOM be slow
"A man finds the horses slow."

(ii) Manninum virðast/virðist *t* [hestarnir vera seinir]
the man.DAT seem.PL/SG the horses.NOM be slow
"The man finds the horses slow." (Holmberg and Hróarsdóttir 2003: 1000)

It should be noted that while no variation has been reported (so far as I am aware) concerning (4) and (34), the judgment of an intervention effect in (i) is controversial (H. Thráinsson, M. Nomura, p.c.). For speakers for whom there is no intervention effect in (i), an analysis of (4) and (34) in terms of raising of the dative to the specifier of TP is possible; see Hiraiwa (2005) and Nomura (2005) for concrete proposals.

raising constructions. The verb *virðast* "to seem" is obligatorily a raising verb when it occurs without an experiencer. Example (35a) shows raising of the embedded nominative subject to matrix subject position. There is no possibility of confusing this with V2 topicalization (as there is whenever an NP is in initial position), since the landing site follows the main verb. Such raising is impossible when there is a matrix experiencer ((35b–d), see Sigurðsson 1996, 25–6; on (c). see also Jonas 1998, 2001).

(35) a. Hafði Ólafur virst [*t* vera gáfaður] ?
Has Olaf.NOM seemed to be intelligent
"Did Olaf seem intelligent?"

b. *Hafði Ólafur þeim virst [*t* vera gáfaður] ?
Has Olaf.NOM them.DAT seemed to be intelligent
"Did it seem to them that Olaf was intelligent?"

c. *Hafði Ólafur virst þeim [*t* vera gáfaður] ?
Has Olaf.NOM seemed them.DAT to be intelligent

d. Hafði þeim virst [Ólafur vera gáfaður] ?
Has them.DAT seemed Olaf.NOM to be intelligent

Curiously, while raising of the embedded nominative across a dative experiencer is impossible, it appears to be (at least marginally) possible for the nominative to undergo such raising across the trace of a moved dative. Relevant examples (originally noted by H. Sigurðsson) are given in (36). As (36b) shows, once the embedded nominative raises, it controls agreement in the matrix clause.

(36) a. Hverjum hefur Ólafur virst t_{wh} [t_{O} vera gáfaður] ?
who.DAT has Olaf.NOM seemed to be intelligent
"Who has found Olaf intelligent?"
(Holmberg and Hróarsdóttir 2003: 1004)

b. Hverjum hafa strákarnir virst t_{wh} [t_{boys} vera gáfaðir]?
who.DAT have.PL the boys.NOM seemed to be intelligent
"Who has found the boys intelligent?"
(Holmberg and Hróarsdóttir 2003: 1010)

If these examples are correctly interpreted, then they involve exactly the kind of movement that is prohibited in (35).[31] The landing site of the moved nominative in (36) is at or above the position of the trace of the matrix dative

[31] Current descriptions (see references above) predict that the pattern in (36) should also be possible when the embedded subject is also quirky. That is, if quirky subjects undergo raising to the specifier

subject. Schematically, what (35) and (36) together appear to illustrate is the following:

(37) a. * V/AUX$_{\text{PL}}$ … DAT … [NOM$_{\text{PL}}$]

b. DAT V/AUX$_{\text{PL}}$ … t$_{\text{DAT}}$ … [NOM$_{\text{PL}}$]

In sum, what the overt movement paradigm in (35)–(36) shows is that a nominative NP from an embedded clause may undergo A-movement into the domain of a matrix verb, where it will control agreement on that verb. Such movement may not cross the overt position of a dative NP, but it is allowed to cross the trace of a dative NP (under poorly understood conditions). Whatever the account of (37), if exactly the same pattern holds for covert movement of the nominative, it may yield precisely the apparent defective intervention effect in (33) on a domain-based view of locality, but without appeal to either restructuring or defective intervention, on the assumption that the unmoved dative blocks covert movement of the nominative into the matrix agreement domain in exactly the same way that the dative blocks overt movement.

At this point, pressing hard against the page limit, I leave the issue of Icelandic, having noted that the intriguing interactions of word order and agreement possibilities that have been previously analyzed as instances of defective intervention (which would be incompatible with the main thesis advanced here), are open to alternative analyses, analyses for which there is perhaps at least suggestive independent evidence.

10.7 Conclusion

In the preceding pages I have offered two arguments in support of the proposition that agreement is a late operation, part of the postsyntactic morphological

of TP (which they do), and if raising to the specifier of TP across the trace of a *wh*-moved experiencer is possible (as (36) shows), then it should be possible to combine these. My preliminary efforts to construct relevant examples have met with judgments of sharp unacceptability, such as (i); the example is fine with an unmoved accusative:

(i) *Hverjum hefur Ólaf virst [t_{O} langa að fara til Islands] ?
who.DAT has Olaf.ACC seemed to long to go to Iceland
"To whom has Olaf seemed to long to go to Iceland?" (H. Thráinsson, p.c.)

component. The primary argument comes from the observation that crosslinguistically it is m-case, and not any syntactic relation (such as abstract case or GF), that determines the accessibility of a given NP for controlling agreement on the predicate. If we accept that m-case is a postsyntactic operation, then the feeding relationship that holds between m-case assignment and agreement controller choice forces the conclusion that agreement is a postsyntactic operation. Converging evidence for this view comes from two observations. On the one hand, we are correctly led to the expectation that it should be possible for an NP to control agreement on a predicate, even if it bears no syntactic relationship to that predicate other than being "close enough". Such effects are amply documented in LDA constructions (and elsewhere, see Comrie 2003). On the other hand, the proposal advanced here leads us to expect that agreement features on the target of agreement do not contribute to interpretation. Heim's contribution to this volume demonstrates the correctness of this prediction, albeit in a slightly different domain. It remains to be shown that this effect is completely general.[32] Just as the Icelandic evidence demonstrated conclusively that m-case must be dissociated from the syntactic relationship that underlies "Case Theory" effects, I have argued above that morphological agreement should also be severed from the basic operations of "narrow syntax", whatever those turn out to be.

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[32] It is important not to confuse correlation and causation on this point. In cases like Tsez LDA there is indeed a correlation between topicality and agreement, but under the account presented above, it is (primary) topichood that makes an NP accessible for agreement (via movement), hence interpretation (a reflection of syntax) causes agreement or non-agreement, and not the other way around. Other examples that show a correlation between agreement and interpretation would need to be reanalyzed in this way.

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11

Cross-Modular Parallels in the Study of Phon and Phi

ANDREW NEVINS

11.1 Introduction

As the variety of papers in this volume makes apparent, φ-features are relevant to many different domains of the grammar: syntax, semantics, morphology, pragmatics. Conspicuously absent from this list is phonology. In the current chapter, I wish to discuss the underlying unity of processes affecting φ-features in different domains of the grammar, and I will argue that operations performed on φ-features in the syntax, in the morphology, and even in the pragmatics strongly parallel operations performed on articulatory features in the phonology.

Below, I will consider two main case studies. The first (Section 11.2) concerns the Person Case Constraint, which bans various clitic/agreement combinations. Although widely attested crosslinguistically, the constraint is subject to variation; for instance, some languages permit the clitic combination *you + to me*, whereas others ban it. I propose that the full scope of variation can be captured in the same way that variation between systems of vowel harmony is captured in phonology. This leads to the claim that Agree is parameterized to be sensitive to all feature values, or to marked ones, or to contrastive ones.

The second (Section 11.3) concerns the ways in which the realization of φ-features can deviate from what is straightforwardly expected. Close inspection reveals that the morphology can simplify complex φ-bundles by, for instance,

This chapter incorporates elements of Nevins (2006, 2007), and a talk given at the Leipzig Morphology Workshop in June 2006, at which Klaus Abels, Jonathan Bobaljik, Gereon Müller, Jochen Trommer, and Dieter Wunderlich provided cogent feedback. I thank Daniel Harbour for inviting my contribution to this volume and for depthless and buoyant encouragement in the course of writing, and Andrea Calabrese whose work in phon influences nearly every word I have said about φ here.

deleting some features or by splitting the entire bundle. Interestingly, not only do these same types of operations affect articulatory features in the phonology, but they act under the same circumstances, namely, when feature bundles, or combinations of feature bundles, are excessively marked.

Finally, some pragmatically surprising uses of the first person inclusive are discussed in Section 11.4. These uses involve symbolic effacement either of speaker or of hearer and show that feature deletion can have interpretative correlates.

11.1.1 *Features as the currency of structure-building*

One of the elements of Phonological Theory and Phi Theory that enables very close comparison, and perhaps unification, of the representations and operations in both domains, is the fact that the basic currency of both phonological segments and of morphological exponence is the feature. When binary, features can be interpreted as boolean predicates that are true or false of, in the case of phon, a given articulatory configuration, or, in the case of phi, a given referential set.

(1) $[+F] = \neg[-F]$

Thus, the phonological height features [±high] and [±low] are binary predicates such that:

(2) a. [+high] is true if the tongue body is raised above the midline of the oral cavity
b. [−high] is true otherwise
c. [+low] is true if the tongue body is lowered below the midline of the oral cavity
d. [−low] is true otherwise

Given the definitions in (2), it becomes evident that although the combination [+high +low] is impossible, as the two predicates cannot be both true simultaneously, the combination [−high −low] is well formed and defines a configuration in which neither [+high] nor [+low] are true, namely a configuration in which the tongue body has been neither raised nor lowered from the midline and the resulting predicate is true of mid vowels.

Thus, although there are three categories of vowel height, phonological theory has pursued representations in which there are two binary features, rather than a single ternary feature. That is, one might imagine that a simple [height: n] feature, where *n* can range over {1, 2, 3}, might be in some way simpler. Clearly a ternary valued system cannot appeal to the tools of binary predicate logic of (1). This in and of itself would be a surmountable issue; the real problems are empirically motivated.

In a [height: n] system, there is no possibility of *grouping* and thus no prediction that, for example, high and mid vowels are more likely to behave together to the exclusion of low vowels than, say, high vowels and low vowels to the exclusion of mid. In the system in (2), however, there is no natural class containing high and low vowels to the exclusion of mid that can be read off from the values of the features themselves. This is a positive result, as there are no known phonological processes (e.g., vowel harmony, apocope, etc.) in which high and low vowels pattern together to the exclusion of mid.

The same decision, then, to represent a three-category system using two binary features rather than a single ternary feature, is a decision that the human mind seems naturally to employ for the morphological category of person in the domain of φ. Thus, although the traditional Aristotelian labels "first, second, and third person" yield the appearance of a ternary-valued system, a great deal of research has revealed that the category of person is represented with two binary values, as in (3).

(3) Person Features (Noyer 1992, Halle 1997, Nevins 2007)

a. [+author] true iff the reference set contains the speaker
b. [+participant] true iff the reference set contains one of the discourse participants

(4) a. [+author +participant] = first person
b. [−author +participant] = second person
c. [−author −participant] = third person
d. [+author −participant] = logically impossible

Thus, the feature assignments in (4) create natural classes between, for example, first and second person, to the exclusion of third person, and at the same time, do not, on their own, create natural classes between first and third person to the exclusion of second. A wide variety of phenomena in morphological exponence reflect a grouping of first and second person, including patterns of syncretism in agreement, patterns of anaphoric binding, and patterns of gender and plural marking in pronouns.[1]

In the discussion of both vowel height and person, it is important to emphasize that although these two binary features yield four combinations, of which

[1] The pattern of 1/3 syncretism found throughout Germanic may still be well-modeled through an Impoverishment-based treatment within this system of features; see Nevins 2003, Harbour 2006 for analyses.

one is impossible, this does not mean that the representational vocabulary is "wasteful", as it creates the prediction that if a syntagmatic operation yields the impossible configuration [+high +low] or [+author −participant], the result will have to be repaired.

(Of course, the logic developed thus far does not require that all features be binary. If the negative value of a feature is never referred to in any syntagmatic process and if the negative value of a feature does not create any groupings that behave alike, then there is little evidence to recommend the negative value of a feature. For example, Steriade (1995) proposes that [nasal] is a privative feature and that [−nasal] is never a feature activated in assimilation or dissimilation processes. In Section 11.4, based on similar considerations, I will discuss the existence of a privative feature, [addressee], whose privative status has been proposed in McGinnis (2005), Nevins (2007) and Harbour (2006).)

As it turns out, a similar situation, of three categories being represented by two binary values, arises once again in Phi Theory for the category of number. For systems with singular, dual, and plural, the following binary values create groupings which are empirically motivated.

(5) Number Features (Harbour 2007, Nevins 2006)

a. [+singular] = $\lambda x[\text{atom}(x)]$
b. [+augmented] = $\lambda P \lambda x \exists y[P(x) \wedge P(y) \wedge y \sqsubset x]$

(6) a. [+singular −augmented] = singular
b. [−singular −augmented] = dual
c. [−singular +augmented] = plural

11.1.2 *Contrastiveness and markedness*

Given a set of phonological features like those for vowel height, person, and number above, two important properties may single out certain sets of features: *contrastiveness* and *markedness*.

Contrastiveness refers to whether a given feature serves to uniquely determine a category in the inventory or not. For example, in the presence of the feature value [−low], the feature [±high] is contrastive, as it serves to uniquely identify high versus mid vowels. On the other hand, in the presence of the feature value [+low], the feature [±high] is not contrastive, because [+low] alone uniquely determines a low vowel.

Markedness refers to whether one value of a binary feature is "singled out" asymmetrically in paradigmatic relations (i.e., implicationally in inventory acquisition, or diachronic change) or in syntagmatic relations. Markedness can be context free, as for example in phonological representations, the feature [−strident], characterizing apicodental fricatives /θ, ð/, among the most difficult consonants for children to acquire, and the crosslinguistically most marked consonants in English. A marked feature is also one for which additional contrasts are more limited; in the case of [−strident], we may observe that the voicing contrast is limited, with a very small number of minimal pairs (*either, ether*) and a very limited distribution of the [+voice] value in initial position, occurring only in determiners, demonstratives, and complementizers. This last aspect of markedness, leading to fewer subdistinctions within a marked category, is dubbed the *syncretizational* aspect of markedness by Greenberg (1963). Reinterpreting the typological research of Harley and Ritter (2002) for φ-inventories in a bivalent feature system leads to the following context-free markedness statements:

(7) Context-Free Markedness
 a. Marked value = + for both [±participant] and [±author]
 b. Marked value = − for [±singular]

In the above cases, markedness is directly read off from one value of a binary feature. Markedness may, however, also be *context sensitive*—in which case, neither value of a feature is inherently marked, but in a given combination with other features, one of the values is more marked. For example, few phonologists would claim that either value of [±back] is marked. However, in the presence of the feature [+round], the feature [−back] is marked. The combination is "unstable", and often leads to diachronic loss of one of these features, as for example in the history of English, where words containing /ü/ (represented by the letter <y>) came to be pronounced with /i/ instead, due to loss of [+round], or in modern borrowings of French/German /ü/, which English speakers pronounce with [+back] /u/, as in the American pronunciations of *Münich* by movie-goers or *au jus* by sandwich-lovers. This combination of features is inherently unstable, due to the fact that [+round] and [−back] have opposite effects on the second formant (F2) of a vowel: while [+round] lowers F2, [−back] raises it. In a similar way, while neither value of [±augmented] is inherently marked, the feature [−augmented] is marked in the context of [−singular], namely, the category dual, whose marked behavior can be established implicationally (the presence of dual implies presence of plural but not conversely), acquisitionally (cf. Ravid and Hayek 2003 on late dual acquisition in Arabic), and syncretizationally (case distinctions are lost in Sanskrit, Zuni, and Slovene in the dual). The combination of [−singular −augmented] is unstable in the sense that it expresses the fact that a cardinality of two is the most minimally nonsingular that one can get, that is, the closest nonsingular to singular. This context-sensitive markedness is expressed in (8).

(8) Context-Sensitive Markedness
[−augmented] marked in the context of [−singular]

Having established that the concepts of contrastivity and markedness apply to φ-features in a manner that parallels phonological features, we turn to a set of phenomena that establish the far-reaching explanatory value of this representational vocabulary in expressing syntagmatic agreement restrictions and in triggering morphological operations.

11.2 Contrastiveness, markedness, and syntagmatic visibility

In this section, I examine syntactic agreement restrictions involving combinations of φ-features in ditransitive arguments, namely, those restrictions on the features that may cooccur on the indirect and direct object which have been grouped under the label of Person Case Constraints (PCC). I discuss how the φ-feature system proposed above allows a restrictive typology of PCC effects that arise from the way that agreement works within the syntax. The current proposal stands in contrast to accounts of the PCC that focus on the **me lui* effect (the fact that combinations of a third person dative and a first or second person accusative are banned) as the result of the fact that third person is "underspecified for person". As a wide range of morphological phenomena point to the fact that third person must consist of a full specification of features (namely [−author −participant]), among them, the spurious *se* phenomenon in Spanish (called the **le lo* constraint in Nevins 2007), one of our goals is to pursue a theory in which third person can be simultaneously visible for some phenomena but "insufficient" or "invisible" for others. Such a theory, developed below, is inspired by value-based relativization in phonology, with central appeal to the properties of contrastiveness and markedness.

11.2.1 *Contrastive visibility: phonological parallels*

I will begin by reviewing a formally identical problem in phonology. Much as in syntax, underspecification was pursued as an attempt to "make invisible" or render deficient those objects which behaved differently (Archangeli 1984). However, immediate problems arose. Consider the plight of coronal underspecification: many researchers attempted to treat coronals as underspecified for place, due to their transparency in assimilation phenomena. However, Mohanan (1991), McCarthy and Taub (1992) and Steriade (1995) pointed out a number of problems for underspecification in phonology: while underspecification made a feature F invisible for process X, it turns out that feature F is *required* to state the environment for some other process Y. The solution to this problem came with Calabrese (1995), who proposed that it is not F which is underspecified, but X and Y which are relativized in their domain of visibility. More specifically, Calabrese proposed that rules may be parametrized to include reference to all values, only contrastive values, or only marked values. Calabrese's idea was that the invisibility of noncontrastive values on certain segments is part of the conditions of a particular rule, but not part of the inherent representation of those segments, since other rules may in fact have to refer to the presence of those values.

Let us consider a case study, based on the behavior of Finnish vowels. Finnish has the inventory in (9), for both short and long vowels.

(9) Finnish Vowel Inventory

	[−back]		[+back]	
	[−round]	[+round]	[−round]	[+round]
[+high −low]	i	ü		u
[−high −low]	e	ö		o
[−high +low]	ä		a	

The language is famous for its vowel harmony, whereby suffixes must agree in [±back] with the root vowels (see, e.g., Ringen 1975). However, a well-known exception is the transparency of [−low −back −round] vowels in harmony. Thus, in a word such as ***k*o*ti-na*** 'home-ESSIVE', the essive suffix takes the [+back] form *-na* (rather than *-nä*), because of the [+back] root vowel *o* in the first syllable of the root. The high front vowel *i* is ignored for the purposes of computing the harmonic value of the suffix. Based on (9), some researchers have proposed that /i/ is underspecified for [±back] throughout the phonology, hence literally invisible at the point at which harmony applies. This solution achieves the goal of making all harmony essentially local, as, by hypothesis, the representation for /i/ lacks [−back] until after harmony is computed.

A problem is caused by depriving /i/ of its [−back] feature, however: the rule of Finnish assibilation (Kiparsky 1973b) turns a coronal stop into a fricative before /i/, as shown in (10). (This rule applies only in derived environments and hence not within roots. It is subject to further conditions, as discussed extensively by Anttila (2003), who points out the important role of metrical conditioning.)

(10) a. t → s / ___ [−round −back +high]
b. /tilat-i/ 'order-PST' → [tilasi]

It is difficult to make a case that assibilation occurs after vowel harmony; thus, judicious ordering of [−high] fill-in after harmony but before assibilation enjoys little support (and no generality as a solution to the problem of underspecification; see Steriade (1995) on other problems with ordering of "fill-in" rules). The process in (10) can be understood as having a phonological basis in the fact that [+high −back] vowels often cause palatalization and lenition of obstruents, in particular, *t* to *s*, with *president∼presidency* as an example of spirantization in English (Chomsky and Halle 1968: 161) beside a host of other crosslinguistic examples, such as affrication of coronal stops before high front vowels in Brazilian Portuguese (Cagliari 1997). In fact, Hall and Hamann (2006) characterize the high, front quality of /i/ as aerodynamically crucial in causing assibilation. However, if Finnish /i/ literally lacks [−back], assibilation cannot be characterized in these terms, because the conditioning feature is, by hypothesis, absent from the representation. Thus, while depriving /i/ of [−back] does work in making it invisible for harmony, such a representation leaves it puzzling why that same vowel should trigger assibilation.

The proper solution, then, is one in which /i/ is fully specified for [−back] throughout the phonology, but in which different processes (e.g., harmony versus assibilation) are differentially sensitive to marked or contrastive feature values. In this case, as /i/ is noncontrastive for the feature [±back] (since there is no other [+high −round] vowel in the inventory to distinguish it from by backness), one can understand Finnish suffixal harmonic alternations as restricted to conditioning by contrastive values of [±back].[2] So, in

[2] An interesting cognitive parallel arises in Sedivy et al. (1999), who made use of the real-time eye-tracking paradigm in an experiment with spoken language and visual contexts. Given a scene with a pink comb, a yellow comb, and a yellow bowl, subjects were given instructions such as *Pick up the yellow comb*. Sedivy et al. found that at the onset of the word *yellow*, subjects looked much faster and more frequently at the yellow comb, even before they had heard the head noun. The only logical explanation is that subjects understood that, given spoken instructions, their interlocutor would be more inclined to use the predicate *yellow* when it was *contrastive* for the object to be manipulated. That is, even

Finnish, vowel harmony is a rule of feature-valuation relativized to contrastive values of [±back] (see Nevins 2004 for a more detailed application of this proposal).

The key idea here, to be adopted in the treatment of person–case effects below, is that certain syntagmatic processes may be restricted in their access to all values of a given feature. Calabrese's proposal for phonological processes such as vowel harmony, which across languages seem to have differing locality conditions and to involve different sets of participating segments, was that the core grammatical principle was the same, but that the search for a feature may be restricted to, for example, only contrastive values of a feature:

(11) Value Relativization
For a feature [±F], a search may be relativized to be sensitive only to the *contrastive* values of [±F], or only to the *marked* values of [±F], or to *all* values of [±F].

This parametric variation in which values of a feature are included in a search turns out to be very useful in understanding microvariation between languages that have the same inventories, but different items that participate in a given grammatical process. Within this chapter, I will extend the general approach to cases of microvariation within person–case effects in clitic clusters.

11.2.2 *Conditions on Multiple Agree*

The general approach that I will take to person–case effects is that they arise when both pronouns/clitics are within the same agreement domain. I will adopt the insight of Anagnostopoulou (2005), Béjar and Řezáč (2003), and Adger and Harbour (2007) that the PCC is a result of two DPs within the domain of a single probing head. Thus, within the framework for agreement proposed in Chomsky (2001) and subsequently refined by Hiraiwa (2001, 2004), (*Multiple*) *Agree* is a featural relation between a probe and a set of one or more goals.

The following two conditions on Multiple Agree will be crucial to the account. These are inspired by Anagnostopoulou (2005) and Hiraiwa (2001, 2004), but formalized differently here. The first pertains to locality within an agreement domain: that, once the visibility parameter is set for a given domain, the highest argument within that domain must fall within the scope of that visibility parametrization.

though the predicate *yellow* was true of both the comb and the bowl, the subjects preferred to interpret it in a contrastive use.

(12) Contiguous Agree
$\forall x \in \text{Domain}(\text{R}(\text{F}))\ \ \forall y\ \ [[\text{F} > y \wedge y > x] \rightarrow y \in \text{Domain}(\text{R}(\text{F}))]$,
where R(F) is a relativization of the probe F

Informally, anything between a probe and an element in its relativized domain is itself in that domain. The second condition pertains to feature identity for elements within that domain: they must match in value with each other.

(13) Matched Values
$\forall x \in \text{Domain}(\text{R}(\text{F}))\quad \forall y \in \text{Domain}(\text{R}(\text{F}))\quad [\text{val}(x, \text{F}) = \text{val}(y, \text{F})]$,
where R(F) is a relativization of the probe F

Informally, all elements within the domain of the relativized probe F have the same value for F. Both conditions are crucial to the present understanding of the PCC.

11.2.3 *Varieties of PCC*

In this section we explore a variety of person–case effects that have been investigated throughout the literature. Bonet (1991) and Anagnostopoulou (2005) discuss the "weak" and "strong" versions of the PCC, which involve different constraints on licit clitic combinations. However, in actuality, four varieties must be distinguished.

(14)

Type of PCC	⟨1 2⟩	⟨2 1⟩	⟨3 1⟩	⟨3 2⟩
weak			✗	✗
me-first		✗	✗	
strictly-descending		✗	✗	✗
strong	✗	✗	✗	✗

Each of these is illustrated below.

The weak PCC bans ⟨3 1⟩ and ⟨3 2⟩, where the first element in each pair is the dative and the second element, the accusative. In other words, a [−participant] dative cannot dominate a [+participant] accusative within the same domain. Consider the following examples from Catalan (Bonet 1991: 178–9); note that clitic order is independent of Case.[3]

[3] Number and its indication are systematically disregarded thoughout this section.

(15) Te ’m van recomanar per a la feina
1DAT/ACC 2ACC/DAT AUX recommended for the job
"They recommended you to me for the job." ⟨1 2⟩
"They recommended me to you for the job." ⟨2 1⟩

(16) *A en Josep, me li va recomanar la Mireia
to the Josep, 1ACC 3DAT AUX recommended the Mireia
"She (Mireia) recommended me to him (Josep)." *⟨3 1⟩

(17) *A en Josep, te li va recomanar la Mireia
to the Josep, 2ACC 3DAT AUX recommended the Mireia
"She (Mireia) recommended you to him (Josep)." *⟨3 2⟩

Next, we examine the strong PCC, which bans all of the configurations of the weak PCC above, as well as excluding configurations in which there are two [+participant] arguments in the same domain that bear different values for the feature [±author]. In other words, in addition to the ban on ⟨3 2⟩ and ⟨3 1⟩ from the weak PCC, in the strong PCC, ⟨1 2⟩ and ⟨2 1⟩ are also banned. An example of such a language is Greek (Bonet 1991, Anagnostopoulou 2003).

(18) *O Kostas mu se sístise
the Kostas 1DAT 2ACC introduced
"Kostas introduced you to me." *⟨1 2⟩

(19) *O Kostas su me sístise
the Kostas 2DAT 1ACC introduced
"Kostas introduced me to you." *⟨2 1⟩

(20) *Tha tu me stilune
FUT 3DAT 1ACC send
"They will send me to him." *⟨3 1⟩

(21) *Tha tu se stilune
FUT 3DAT 2ACC send
"They will send you to him." *⟨3 2⟩

We now turn to the me-first and strictly-descending PCC, which are intermediate in restrictiveness between the weak and strong PCC, and less widely encountered than either.

The me-first PCC bans configurations in which a [−author] argument dominates a [+author] argument; in other words, if there is a first person argument, it must be first in the domain (that is, first in the notation ⟨1 x⟩, not necessarily first in the clitic cluster). This is illustrated in Romanian (Farkas and Kazazis 1980; Ciucivara 2004):

(22) Maria me- te- a prezentat
Maria 1DAT 2ACC has introduced
"Maria has introduced you to me." ⟨1 2⟩

(23) *Maria tie- m- a prezentat
Maria 2DAT 1ACC has introduced
"Maria has introduced me to you." *⟨2 1⟩

(24) *Maria i- m- a prezentat
Maria 3DAT 1ACC has introduced
"Maria$_m$ has introduced me to her$_z$." *⟨3 1⟩

(25) Maria i- te- a prezentat
Maria 3DAT 2ACC has introduced
"Maria$_m$ has introduced you to her$_z$." ⟨3 2⟩

Akin to the me-first is the strictly-descending PCC. It differs from the aforementioned in banning ⟨3 2⟩ too. This is illustrated by Classical Arabic (Abdelkader Fassi-Fehri p.c., and Fassi-Fehri 1988: 116; see Fernández-Soriano 1999: 1297 for parallel facts in Spanish).

(26) ʔaʕṭa:- ni:- ka
gave.3SUBJ- 1DAT- 2ACC
"He gave you to me." ⟨1 2⟩

(27) *ʔaʕṭa:- ka- ni:
gave.3SUBJ- 2DAT- 1ACC
"He gave me to you." *⟨2 1⟩

(28) *ʔaʕṭay- ta- hu:- ni:
gave- 2SUBJ- 3DAT- 1ACC
"You gave me to him." *⟨3 1⟩

(29) *ʔaʕṭay- tu- hu:- ka:
gave- 1SUBJ- 3DAT- 2ACC
"I gave you to him." *⟨3 2⟩

11.2.4 *Account of the PCC*

Turning to a syntactic account of these PCC effects, I will adopt Anagnostopoulou's (2005) idea that the strong and weak (and, I claim, the other versions of the) PCC all arise in the same configuration: when two weak DPs are in the domain of the same head. An interesting challenge here is to understand and explain how there can be so much microvariation reported for dialects of Spanish/Catalan; in the words of Bonet (1991: 179): "The judgements concerning combinations of first and second person clitics vary considerably from speaker to speaker." Ideally, this microvariation is best understood in terms of a microparameter on the head that facilitates such configurations.

(30) Desideratum
All versions of the PCC should be explained by the same syntactic mechanism, differing only in relativization to which (values of which) features must obey the constraint

The crucial idea that I will adopt here is that the locus of variation is in the search domain as set by the probing head in charge of agreement within this domain (the proposal is consistent with this head being identified either as *v* or Appl, and no commitment is made here). I will thus adopt an idea that is inspired by Béjar (2003): variation in the agreement "preferences" of a given multi-argument configuration are due to the featural requirements for agreement set by the probe.

Thus, rather than viewing PCC effects as arising from the nature of the representations specified on arguments (e.g. "3rd person datives have no person feature in Spanish"), what I will pursue here is the idea that "strength" of PCC depends on how many values are excluded by the relativization domain as set on the agreeing head that controls the domain. Once the parametric choice of value-relativization of the domain is chosen, the conditions on an Extended Agree domain (with no interruptions/interveners in the domain) and on Matched Values (with agreeing values for the chosen feature) must be met. Let us proceed to see how varying relativizations of the search domain will yield the varieties of the PCC.

11.2.4.1 *Deriving the weak PCC* In the first scenario to consider, the search has been relativized to the marked (i.e., positive) values of [±participant] (7). For a convergent derivation to occur, therefore, the following condition must be met (CA—Contiguous Agree): there cannot be any unmarked values of [±participant] that intervene between the probe and elements with the feature specifications it is looking for. Note that a second condition, MV (Matched Value), is trivially met when there is marked relativization to a single value of a binary feature (as in this case), as there cannot be elements within this domain that have differing values for the feature in question. The possibilities for clitic ordering are given below (31), and, in each case, a '✗' indicates that the configuration fails to meet a condition on Multiple Agree.[4] Checkmarks (✓) are used to indicate convergent derivations.

(31) Weak PCC: If Acc is 1/2, then Dat is 1/2
Relativization: Marked [±participant]

		CA	MV
✓	⟨1 3⟩		
✓	⟨1 2⟩		
✓	⟨2 1⟩		
✓	⟨2 3⟩		
	⟨3 1⟩	✗	
	⟨3 2⟩	✗	

To summarize the intuition behind the weak PCC within the current syntactic implementation: the probe is searching for marked values of [±participant]. Configurations such as ⟨3 1⟩ and ⟨3 2⟩ constitute violations of the Contiguous Agree domain, because a nonmarked value of [±participant] interrupts the Agreement span. Independent of the particular implementation in terms of Multiple Agree given here, the general logic behind the claim is that given the feature [±participant], a marked value of this feature cannot be only on the lower argument within the domain of the *v*P.

11.2.4.2 *Deriving the strong PCC* The strong PCC results from relativization of a probe to contrastive values of [±author]. According to the definition of contrastiveness, whereby a feature [±F] is only contrastive in a feature set S if both values of [±F] may occur in S, [±author] is not contrastive in the context of [−participant], that is, in third persons. Given this relativization on the probe, the condition on Continuous Agree will be contravened when a noncontrastive value of [±author] intervenes in the agreement span, namely when a third person dominates a first or second person in the domain.

[4] This is purely for presentational purposes; readers who see an affinity with optimality-theoretic tableaux are reminded that these conditions are inviolable and unranked.

Moreover, given this relativization, as Multiple Agree can potentially apply within combinations of first and second person, the condition on Matched Values for Multiple Agree will lead to an illicit derivation when there are conflicting contrastive values for [±author], namely [+participant +author] and [+participant −author]. The possibilities for clitic ordering are given below (32).

(32) Strong PCC: Acc must be 3
Relativization: Contrastive [±author]

		CA	MV
✓	⟨1 3⟩		
	⟨1 2⟩		✗
	⟨2 1⟩		✗
✓	⟨2 3⟩		
	⟨3 1⟩	✗	
	⟨3 2⟩	✗	

Summarizing the strong PCC intuition, since the probe is searching for contrastive values of [±author], configurations such as ⟨3 1⟩ and ⟨3 2⟩ constitute violations of the Contiguous Agree domain, because a noncontrastive value of [±author] interrupts the Agreement span, while configurations of 1 and 2 constitute violations of the Matched Value condition. Independent of the particular implementation in terms of Multiple Agree given here, the general logic behind the analysis of the strong PCC here is that given contrastive values of [±author], there cannot be distinct values of this feature within the domain of the *v*P.

11.2.4.3 *Deriving the me-first PCC* The me-first PCC has received little analytical attention in the literature. The constraint is that if the dative is 2/3, the accusative cannot be first person. This constraint arises when there is a relativization on the probe to agree with marked values of [±author], which are the positive values according to (7). For a convergent derivation to occur, therefore, the following condition must be met (CA): there cannot be any unmarked values of [±author] that intervene between the probe and elements with the feature specifications it is looking for. Note that the second condition, MV, is again trivially met. The possibilities are given below (33).

(33) Me-First PCC: Acc Cannot be 1
Relativization: Marked [±author]

		CA	MV
✓	⟨1 3⟩		
✓	⟨1 2⟩		
	⟨2 1⟩	✗	
✓	⟨2 3⟩		
	⟨3 1⟩	✗	
✓	⟨3 2⟩		

To summarize the me-first PCC intuition, the probe is searching for marked values of author. Configurations such as ⟨3 1⟩ and ⟨2 1⟩ constitute violations of the Contiguous Agree domain, because a nonmarked value of [±author] interrupts the Agreement span. The general logic behind the claim is that given the feature [±author], a marked value of this feature cannot be only on the lower argument within the domain of the *v*P.

11.2.4.4 *Deriving the strictly-descending PCC* Descriptively, the strictly-descending PCC is the sum of the me-first and the weak versions. Theoretically, it is the conjunction of the relativizations of these versions: marked [±author] and marked [±participant]. That the strictly-descending PCC requires this joint relativization may go some way to explaining its rarity. A convergent derivation requires that there be no unmarked values of [±author] and no unmarked values of [±participant] that intervene between the probe and elements with the feature specifications it is looking for. The possibilities are given below (34). The features, [−author] or [−participant],

(34) Strictly-Descending PCC: Acc Cannot be 1; Nor 2 if Dat is 3
Relativization: Marked [±author], marked [±participant]

		CA	MV
✓	⟨1 3⟩		
✓	⟨1 2⟩		
	⟨2 1⟩	✗	[−author]
✓	⟨2 3⟩		
	⟨3 1⟩	✗	[−author] [−participant]
	⟨3 2⟩	✗	[−participant]

that intervene and cause the derivation to crash are indicated on the appropriate lines.

To summarize the strictly-descending PCC intuition, the probe is searching for marked values of author and participant. Configurations such as ⟨3 1⟩ and ⟨2 1⟩ constitute violations of Contiguous Agree, because a nonmarked value of [±author] interrupts the Agreement span. Configurations such as ⟨3 1⟩ and ⟨3 2⟩ constitute violations of Contiguous Agree, because a nonmarked value of [±participant] interrupts the Agreement span. The general logic behind the analysis of the strictly-descending PCC given here is that given the features [±author] and [±participant], a marked value of either of these features cannot occur on only the lower argument within the domain of the *v*P.

11.3 Impoverishment rules and repair operations

While the last section explored the logic of contrastiveness and markedness of φ-features with the syntax proper, in this section I discuss morphological processes that apply to these features. In the first two subsections I examine cases of postsyntactic feature deletion involving the marked feature [+author] with a case from English (Section 11.3.1), marked [+participant] with a case from Basque (Section 11.3.2.1), and contextually marked [−augmented] with a case from Warlpiri (Section 11.3.2.2). In Section 11.3.3 I examine another markedness-induced postsyntactic repair operation, breaking, with a case from marked privative [addressee].

11.3.1 *Repair via impoverishment*

Of central interest to morphological theory are cases of mismatches: when the combinatorics of syntax create a structure, but the realization of φ-features deviates from what is expected. As a working assumption in exploring mismatches between what the syntax generates and what the morphology realizes, we adopt a model in which all syntactic computation occurs prior to morphological realization of φ-features. That is, we adopt a model in which the syntax operates with abstract morphological features such as [±author], [±singular] and combines and copies these features, after which the process of Vocabulary Insertion occurs. Vocabulary Insertion is a process of inserting phonological material (i.e., an exponent) that realizes a set of syntactic features present at a particular syntactic node. One of the most canonically adopted principles governing the selection of an exponent to realize a particular set of φ-features at a node is the Subset Principle, based on the formulation in Halle (1997).

(35) a. The Subset Clause
A phonological exponent realizes a feature bundle (syntactic node) if the item matches all or a subset of the grammatical features specified in the syntactic node. Insertion does not take place if the vocabulary item contains features not present in the syntactic node.

b. The Maximal Subset Clause
Where several vocabulary items meet the conditions for insertion, the item matching the greatest number of features specified in the syntactic node must be chosen.

(It is important to note in passing here, while drawing phi–phon parallels, that (35) closely resembles the Elsewhere Condition of Kiparsky (1973a), governing the selection of which phonological rule to apply when more than one matches a phonological string.)

Our focus here is on cases in which the operation of (35) is not sufficient to explain the phonological exponents that are chosen to realize a given set of morphological features, and in fact, in which (35) alone might lead us to expect a wholly different outcome. As an introductory case, we may consider the "*amn't* gap", discussed by Francis (1985). Although contraction of a pronoun and a copula in a sentence with negation is licit (e.g., *I'm not lucky*), when negation and the auxiliary contract due to question-inversion, the expected *amn't* form cannot surface; thus **Amn't I lucky* is not a possible output in British or North American adult English. The resulting *amn't* gap is not something we would want to model as a syntactic restriction: there is little motivation for a syntactic rule that bans head-movement of negation together with first person copula to the complementizer position. More damning for a syntactic account of this phenomenon is the fact that the result of attempting to ask a negated-copula question with a first person subject is not ineffable. Speakers who wish to convey such questions do so through the use of morphological exponents for the copula that exhibit a clear mismatch:

(36) a. Aren't I lucky?
b. Isn't I lucky?

Speakers who utter (36a) exhibit a mismatch in the feature of number: the vocabulary item *are* is not used with first person singular subjects, though it is used with first person plural subjects. Speakers who utter (36b) exhibit a mismatch in the feature of person: the vocabulary item *is* is not used with first person singular subjects, though it is used with third person singular subjects. Such phenomena are captured very well in a model of postsyntactic realization of features. In our pursuit of cross-modular parallels, we may note the fact that it is quite common to observe in phonology a situation in which a syntagmatic process creates and the result must undergo subsequent "repair". Thus we may assume that the syntax operates with the same process of head-movement of negation and copula to the complementizer position in questions, regardless of the φ-features on the copula, but that the result may not ultimately contravene the following feature cooccurence ban:

(37) *Amn't* Ban
*[+author +singular] on the same node as [+negative] under C^0

In examining (37), we may attempt to understand it in terms of markedness: as negation is marked, [+author] is marked, we may understand the ban in (37) as a reaction to the doubly marked presence of these features on the same node. In understanding (37) in terms of markedness, we are doing more than attempting a post hoc motivation for the existence of the ban: we are crucially predicting, for example, the nonexistence of a pattern, in any language, such as the following:

(38) Impossible Pattern Given the Markedness Account
a. Ban: *[−author +singular] on the same node as [+negative]
b. Allowed: [+author +singular] on the same node as [+negative]

Thus, the formalization of the *amn't* gap as a ban on feature cooccurrence as in (37), with direct reference to the φ-features, allows for implicational predictions based on markedness. Perhaps even more importantly, the formalization of the *amn't* gap as a ban on feature cooccurrence as in (37) permits scenarios in which there is more than one way to resolve the cooccurrence restriction. At this point, a very important parallel with phonological theory emerges, sufficient to motivate a brief overview of the process of metaphony in Italian.

Metaphony is a process that involves the spreading of the feature [+high] from a final vowel onto the stressed vowel, which is usually penultimate in Romance nouns, and will be penultimate in all of the examples we consider. This process of spreading a height feature gives rise to alternations such as those in (39), in which the stressed underlyingly mid vowels *e, o* raise to *i, u* as a result of the presence of a high final vowel. The following Veneto examples are from Calabrese (1998: 31); all examples of metaphony discussed in this section are from Calabrese (1998).

(39) a. vedo "I see" te vídi "you see"
b. coro "I run" te cúri "you run"

The relevant dialects of Italian for our discussion have the seven-vowel system illustrated in (40), given the vowel features [±high], [±low], [±back], and [±ATR] (advanced tongue root).

(40)

	[−back]	[+back]
[+high +ATR −low]	i	u
[+high −ATR −low]	*	*
[−high +ATR −low]	e	o
[−high −ATR −low]	ɛ	ɔ
[−high −ATR +low]	*	a

Importantly, the system in (40) contains a feature cooccurrence ban: vowels composed of the following features are simply disallowed in these dialects:

(41) Cooccurrence Restriction
*[+high −ATR] under the same [−consonantal] node

A feature set contravening the ban may be generated under the normal application of metaphony: when [+high] is spread to a stressed vowel that also happens to be [−ATR], [+high −ATR] results and, in virtue of (41), must be "dealt with". Consider Foggiano Italian, which has straightforward spreading of [+high] to the [+ATR] mid vowels:

(42) a. móʃʃa "soft.FEM" múʃʃu "soft.MASC"
b. kʲéna "full.FEM" kʲínu "full.MASC"

When [+high] spreads to [−low −ATR], the result contravenes (41). As a repair, Foggiano Italian deletes [−ATR] from the feature set (Calabrese 1998: 44). The result is an alternation between a mid [−ATR] vowel and a high [+ATR] vowel, a phenomenon sometimes known as "hypermetaphony":

(43) a. grɔ́ssa "big.FEM" grússu "big.MASC"
b. pɛ́te "foot.SG" píti "feet.PL"

The result in (43) is straightforward if we understand Foggiano as responding to the ban in (41) through the repair operation of feature deletion:

(44) Foggiano Repair
Delete [−ATR] when on the same node as [+high]

Let's return now to the *amn't* gap. Resolution of (37) may occur via deletion of one of the offending features, in very much the same manner as (44). In particular, in response to (37), one may delete [+author].

(45) Possible *amn't* repair
Delete [+author] when on the same node as [+singular] and [+negative] under C^0

In order to have the appropriate effect, (45) must occur after the syntax has already generated the offending combination, and before vocabulary insertion has applied to insert the form of the copula. Deletion rules that operate on φ-features after syntactic computation but before vocabulary insertion are called *impoverishment* rules, as they "impoverish" a node of its featural "richness".[5] Thus, in order to see the potential effects of (45) in remedying the *amn't* gap, we must first state the relevant vocabulary items for the English present tense copula:

(46) /am/ ⇔ [+author +singular +copula +present]
/is/ ⇔ [+singular +copula +present]
/are/ ⇔ [+copula +present]

It will be noticed that *am* is the most highly specified vocabulary item. Thus, when the output of the syntax contains a node with the feature set [+author +singular +copula +present], *am* will always be inserted rather than the other two vocabulary items. The other two vocabulary items are compatible with such a feature set, but do not constitute the *maximal* available subset, in accordance with (35). Thus, in normal scenarios, the output of syntax with the (partial) feature set [+author +singular +copula +present] triggers insertion of *am*. However, when such a node cooccurs with [+negative] under the node C^0, as the result of head-movement and question formation, the result contravenes the filter in (37) and must be repaired.

Much like the case of metaphonic [+high] spreading to [−ATR] vowels, then, we have a scenario in which combinatorial operations create, but the result must be repaired. Impoverishment rules are a repair operation

[5] Though we follow the terminology established by Bonet (1991) and subsequent authors here, it is important to emphasize that deletion rules such as (45), as an imperative to delete offending material, are perhaps more akin to a "purge" of something unwanted, rather than impoverishment of something that was treasured.

for taking care of a set of nodes that contravene a filter like the one in (37). Impoverishment, as a feature deletion rule, occurs in response to context-sensitive markedness in this case. Importantly, as the context-sensitive markedness involves the features [+author] and [+singular] together with [+negative], in principle, either of these features could be deleted in order to satisfy (37). In fact, we find precisely two different repairs occurring, under just this logic.

The first of these repairs is in much wider distribution, especially in North America:

(47) Repair to *Amn't* Filter I
Impoverish [+singular]
(Result prior to vocabulary insertion: [+author +copula +present])

Given the vocabulary items in (46), the impoverishment rule in (47) will yield a set of features that is realizable by *are*, and the result will be dialects that deal with the *amn't* gap by saying *Aren't I lucky?* (Francis 1985).

The other repair, somewhat less well-known, is to impoverish person:

(48) Repair to *Amn't* Filter II
Impoverish [+author]
(Result prior to vocabulary insertion: [+singular +copula +present])

Given the vocabulary items in (46), the result of impoverishment will be a set of features that still contains the number feature [+singular], and thus realizable only by *is*. The result occurs in dialects that say *Isn't I lucky?*

Importantly, then, the system of filters-and-repairs, implemented in terms of morphological markedness and impoverishment rules, bears a great deal of similarity to scenarios in phonology, in which the same filter may be repaired in various ways. Consider, for example, hiatus of two vowels, which, as discussed at length in Casali (1998) and Calabrese (2005), may be repaired by various different operations, such as deleting the first vowel, deleting the second vowel, coalescing the two into a single vowel that shares the features of both, or performing glide formation. An important result emerges for cases like the (37) filter: the morphological microvariation documented by Francis (1985) is the consequence of different repairs to the same filter.

11.3.2 *Impoverishment: additional case studies*

11.3.2.1 *Basque [+participant]* We turn to a second case study that illustrates the same phenomenon of microvariation as a result of different repair operations to the same markedness filter. Basque auxiliaries show agreement with both the ergative and absolutive arguments (and with datives and allocutives as well, though these will not be relevant for the current discussion). In Bizkaian dialects of Basque, there is a "dissimilation" constraint that bans adjacent [+participant] features on the same auxiliary, dubbed the "*g/z*-constraint" by Arregi and Nevins (2006), owing to its morphological exponents. The *g/z*-constraint is always resolved by feature-deletion, although which feature deletes may be a point of microvariation. The structural description for the application of the impoverishment rules is in (49). Note again that this is a syntagmatically marked configuration, and recalls a number of phonological configurations in which adjacent identical values of a feature are banned.

The *g/z*-constraint disallows two structural descriptions: (i) second person ergative and first person plural absolutive (**you–us*); and (ii) first person plural ergative and second person absolutive (**we–you*):

(49)

	Ergative	Dative/Absolutive
	[+participant]	[+participant]
<u>and either</u>		
	[−author]	[+author −singular]
<u>or</u>		
	[+author −singular]	[−author]

What is common to all dialects is that the structural description contains two adjacent [+participant] features, which is what triggers dissimilatory repair. Just as phonological theory incorporates a notion of the Obligatory Contour Principle as a trigger for segmental rules of feature-deletion (e.g., Yip 1988), impoverishment rules repair configurations generated by the syntax that contravene (49). Importantly, as (49), like any syntagmatically marked configuration, contains two potential repair sites, we expect microvariation to emerge in dictating which repair is chosen. In two Bizkaian dialects, Maruri and Ondarru, we find just this microvariation. The same combination of pronominal arguments, a second person ergative and a first person plural absolutive, is repaired by impoverishment of the former argument in Maruri but impoverishment of the latter argument in Ondarru.

In (50), the second person ergative agreement on the auxiliary is deleted; thus the expected suffix -*su* surfaces instead as default ergative suffix -Ø (which is employed for third person). This is the result of an impoverishment rule deleting [+participant] on the ergative agreement node in repair to (49).

(50)	(*Suk gu ikusi*) g-	aittu-**su**	→ g-	aittu-**Ø**
	(*You us seen*) 1PL.ABS-TR-	**2SG.ERG**	→ 1PL.ABS-TR-	**3SG.ERG**
	"You have seen us."			(Maruri; de Yrizar 1992, vol.1: 651)

In (51), the 1PL.ABS agreement on the auxiliary is deleted; thus the expected prefix *g-* surfaces instead as default *d-*, employed with third person absolutives. This is the result of an impoverishment rule deleting [+participant], as well as the concomitant features [+author −singular], on the absolutive agreement node in repair to (49).

(51) (*Suk gu ikusi*) **g-** aitxu-su → **d-** o- su
(*You us saw*) **1PL.ABS**-TR- 2SG.ERG → **3SG.ABS**-TR-2SG.ERG
"You have seen us." (Ondarru; Ikuska Ansola, p.c.)

This impoverishment rule has an additional effect in that the auxiliary root HAVE normally displays an allomorph *-aitxu* in the presence of a [+participant] absolutive, but as a result of impoverishment of [+participant] on the absolutive node, the elsewhere auxiliary root *-o* appears instead.

In both examples, we can tell that the impoverishment rule is a postsyntactic effect, as the pronominal arguments retain their first and second person features. The impoverishment rule specifically targets adjacent feature identity on the auxiliary that arises as a result of agreement processes during the syntax. It is important to contrast this with the PCC effects in Section 11.2, therefore: PCC effects cannot be "repaired" through a postsyntactic impoverishment operation on the verbal agreement, and are prohibited by the very mechanisms of syntactic agreement. The *amn't* gap and the Basque *g/z*-constraint, on the other hand, arise as a result of agreement-as-usual, with postsyntactic repair of a marked configuration created by the combinatorics of syntax.

11.3.2.2 *Warlpiri dual* Impoverishment of φ-features in a syntagmatic configuration arises as the result of two types of phenomena: (i) head-movement of a lower node, as in the case of Neg^0 moving to T^0 and onwards in question formation, thus placing subject agreement features on the same node as [+negative], or (ii) multiple-argument agreement, as in the case of Basque, in which two sets of φ-features may come to be realized on the same auxiliary. In both cases thus far, we have observed that the marked features [+author] in (37) and [+participant] in (49) lead to a cooccurrence restriction requiring repair. We turn to a further case of impoverishment in repair to a syntagmatically marked configuration created by multiple argument agreement, for the contextually marked feature [−augmented], which is marked in the context of [−singular] (8).

We begin by noting the following constraint:

(52) WESTERN WARLPIRI NUMBER CONSTRAINT
*[−augmented −singular] on a clitic adjacent to a [−singular] clitic

Like Basque, Warlpiri auxiliaries agree with both the ergative and the absolutive argument. Whenever there is a dual clitic on the same node as a nonsingular clitic, the [−augmented] feature of the dual is deleted. The result of deletion of [−augmented] on a node bearing [−singular], of course, is a feature set that will allow insertion of plural, rather than dual morphology. Impoverishment of [−augmented] on a dual, leading to dual–plural syncretism, is a crosslinguistically common feature-deletion operation (cf. Vinka 2001 on Sámi). In Western Warlpiri, the combination of a dual argument with a plural (or dual) argument yields plural agreement instead of the expected dual:

(53) maliki-tjara-ḷu ka- lu- tjana wawiri- patu nja-nji
dog- DL- ERG PRES-3PL-3PLO kangaroo-PC see-NPST
"Two dogs see several kangaroos." (Western Warlpiri; Hale 1973: 330)

Notice that the dual marker still remains on the subject argument, and thus it is only the agreement node that is affected, by virtue of combinatorially creating multiple argument agreement with adjacent identical marked values. The impoverishment rule that repairs the violation to (52) in Western Warlpiri is the following:

(54) WESTERN WARLPIRI NUMBER REPAIR
Delete [−augmented] on a [−singular] clitic when adjacent to a [−singular] clitic

Importantly, given the formulation of (54) in terms of deletion of the contextually marked feature [−augmented] in the environment of [−singular], when a configuration arises in which both arguments are dual (i.e., both [−singular −augmented]), (54) will require deletion of both instances of [−augmented]. As a result, when *both* clitics are dual, they *both* neutralize with plural:

(55) ŋatjara- ḷu ka- ṇalu- njara njumpala nja-nji
1EX.DL- ERG PRES-1EX.PL-2PLO 2DL see-NPST
"We two see you two" (Western Warlpiri; Hale 1973: 330)

The case of adjacent duals in Warlpiri is yet again a scenario, however, in which microvariation is attested. In Eastern Warlpiri, the structural description of the cooccurrence filter is subtly different from (52):

(56) EASTERN WARLPIRI NUMBER CONSTRAINT
*[−augmented −singular] on a clitic adjacent to a [−augmented −singular] clitic

Thus, while (52) eliminates a contextually marked feature in the environment of adjacent identity for the feature responsible for the *context* of markedness, (56) eliminates a contextually marked feature in the environment of adjacent identity for the feature responsible for the context of markedness *and* the marked feature itself, i.e., total identity. This is a point of variation that we might expect precisely with context-sensitive markedness: syntagmatic dissimilation may be triggered by the feature itself, the context, or exclusively by the combination of both. As Eastern Warlpiri has impoverishment only under syntagmatic identity of both [−augmented] and [−singular], impoverishment of [−augmented] does not occur in dual–plural combinations, such as (53), but does occur in dual–dual combinations, such as (55).

In addition to variation in the structural description of the filter, Eastern Warlpiri differs from Western Warlpiri in the nature of the repair. Specifically, in certain combinations of dual–dual, only one of the dual arguments is impoverished. The choice of which dual argument is impoverished is based on the person features of the arguments. Hale (1973: 331) remarks that a "hierarchy" appears to govern dual impoverishment in Eastern Warlpiri, such that 1 > 2 > 3; in other words, when a first person and second person are both dual, the second person will be the one to undergo impoverishment, and when a third person and a first or second person are both dual, the third person will be the one to undergo impoverishment. This is illustrated by the following examples of 1DL-2DL and 2DL-1DL combinations, in which it is always the 2DL argument that undergoes [−augmented] impoverishment, yielding surface appearance of the plural morpheme.

(57) ŋatjara- ḷu ka- ḷitjara- njara njumpala nja-nji
1EX.DL- ERG PRES-1EX.DL-2PLO 2DL see-NPST
"We two see you two" (Eastern Warlpiri; Hale 1973: 331)

(58) njumpala-ḷu ka- nkulu-tjaraŋku ŋatjara nja-nji
2DL- ERG PRES-2PL- 1DLO 1DL see-NPST
"You two see us two" (Eastern Warlpiri; Hale 1973: 331)

We may capture this hierarchy without explicit reference to a hierarchy. The logic of the Subset Principle (35), formulated for maximally specified features for the operation of Vocabulary Insertion, may be extended to choosing between disjunctive application of impoverishment rules with overlapping structural descriptions. Thus, consider the following three impoverishment rules, all of which arise as repairs to the structural description in (56).

(59) a. Delete [−augmented] on a [−singular] clitic when adjacent to a [−augmented −singular] clitic that is [+author +participant]

b. Delete [−augmented] on a [−singular] clitic when adjacent to a [−augmented −singular] clitic that is [+participant]
c. Delete [−augmented] on a [−singular] clitic when adjacent to a [−augmented −singular] clitic

Clearly, (59a) will trump (59b–c), and (59b) will trump (59c), simply in virtue of the quantity of feature specification in the statement of the rules; again, in a manner reminiscent of Kiparsky's Elsewhere Condition, the most specific rule (repair) is chosen, where specificity is determined by maximal subsethood of φ-features.[6]

The Warlpiri data provide a case study of a syntagmatic rule of markedness reduction operating in the context of multiple dual morphemes, further support for the conclusion that dual is a marked category, and evidence of microvariation in the nature of markedness-based dissimilation in terms of both its structural description and chosen repairs.

11.3.3 *Repair via breaking*

Thus far our discussion has focused on filters such as (37), (49) and (52), (56), which ban the cooccurrence of feature-values [αF] and [βG] on the same morphosyntactic node *N*, and repairs to these filters by deletion of [αF], [βG], or both. There is, however, another way to circumvent a filter of [αF] and [βG] on *N* without deleting anything: namely, generating a new node *N′*. Like two chemical compounds which must be kept in separate beakers, as long as [αF] remains on *N* and [βG] remains on *N′*, the cooccurrence filter will be respected. Such cases, of generating a new node to host one of the offending features, is a strategy we will call "breaking", following Calabrese (1998), who investigates such repair operations in the context of Italian metaphony. We thus return to the phonological feature cooccurrence filter (41), repeated below:

(60) *[+high −ATR] under the same [−consonantal] node

Recall that metaphony is the spreading of a [+high] feature to the stressed vowel, resulting in a change in height of the stressed vowel, whose output must ultimately respect (60). In Arpino Italian, the effect of metaphonic spreading of [+high] from plural suffixes has undergone morphologization: although

[6] Incidentally, the Eastern Warlpiri dual impoverishment pattern provides a further argument that person should be captured with [±author] and [±participant]. The alternative system of binary [±author] and [±addressee] (actually proposed by Hale, and many others subsequently) cannot naturally capture the fact that second person, and not first person, undergoes dual impoverishment in (57) and (58), as there is no natural subset relation between putative [+author −addressee] ("first person" in that system) and [−author +addressee] ("second person" in that system).

the number endings have become reduced to schwa, the effect of metaphony remains, inducing height alternations in which an underlyingly mid vowel in the singular corresponds to a raised vowel in the plural. Morphologized metaphony affecting [+ATR] mid vowels is illustrated in (61):

(61) a. mésə "month.SG" mísə "month.PL"
b. fjórə "flower.SG" fjúrə "flower.PL"

Arpino Italian has the vowel system in (40) and thus has underlying [−ATR] mid vowels which can potentially serve as targets for metaphony. However, recall that when metaphonic [+high] feature-docking affects [−ATR] vowels, the [+high −ATR] result must be "dealt with." Arpino Italian "breaks" this illicit combination through diphthongization (Calabrese 1998: 19): a [+high] glide is created, in order to host the offending [+high] feature.

(62) a. vɛ́rmə "worm.SG" vjɛ́rmə "worm.PL"
b. fɔ́rtə "strong.SG" fwɔ́rtə "strong.PL"

The nature of breaking in segmental phonology yields diphthongization: when the cooccurring features [+high −ATR] occur on the same node N, the repair is to generate a secondary node N' to the left, and send [+high] to the first node, send [−ATR] to the second node, and keep [−low αround] on both.

Cases of breaking with φ-features may arise when a paradigmatically marked feature set is copied via agreement: instead of impoverishment, breaking is another possible repair operation. Consider the category of inclusive we, which is well-known to be marked on both implicational and formal grounds. We adopt the view of McGinnis (2005) that systems with first person inclusive involve a language-specific adoption of the privative feature [addressee]. The feature representation of inclusive we ("inclusive") is thus the following marked combination:

(63) FEATURE REPRESENTATION OF *inclusive*
Marked combination of [+participant +author −singular] with [addressee]

The feature set in (63) is paradigmatically marked: the feature set on its own is marked, independently of multiple argument agreement or head-movement by negation. Given the marked combination in (63), we can envision various repair operations. For example, Mam deletes the entire set of features in its suffixal node:

(64) MAM EMPHATIC POSSESSOR MORPHOLOGY (England 1983)

Possessor	*x's cat*
1SG	**n**-wi:xh-**a**
2SG	**t**-wi:xh-**a**
3SG	**t**-wi:xh
1EX	**q**-wi:xh-**a**
1IN	**q**-wi:xh
2PL	**ky**-wi:xh-**a**
3PL	**ky**-wi:xh

The vocabulary items for the prefixes are straightforward:

(65) PREFIXAL VOCABULARY ENTRIES
/n-/ ⇔ [+author +participant +singular]
/t-/ ⇔ [−author +singular]
/q-/ ⇔ [+author +participant −singular]
/ky-/ ⇔ [−author −singular]

In this case, there is simply no vocabulary item that is specialized for the inclusive; the same prefix is employed for both inclusive and exclusive 1PL (i.e., with and without the presence of [addressee]). Syncretism here emerges as the result of underspecified vocabulary items and shared feature identity among the syncretizing categories. However, when we consider the distribution of the suffixes -*a* and -Ø, a syncretism emerges between the inclusive and third person. Clearly these two categories have no features in common in the system of person features adopted here. Putting aside the inclusive for a moment, consider the following vocabulary entries:

(66) SUFFIXAL VOCABULARY ENTRIES
/-a/ ⇔ [+participant]
/-Ø/ ⇔ []

Given the markedness of the inclusive in (63), an impoverishment rule operative in the suffixal position of exponence can potentially delete all of the offending features.

(67) Delete all features in the set [+participant +author −singular addressee] on the suffixal node

The result of (67), prior to vocabulary insertion, will render the resulting feature set only eligible for realization by the elsewhere vocabulary item -Ø in (66). The inclusive/third person syncretism thus results from the fact that the former undergoes paradigmatic impoverishment, rendering it featurally available for insertion by only the elsewhere item, which is also chosen to realize the latter.

Syncretisms such as inclusive/third person, which cannot be the result of shared feature specification, may thus be understood as the result of impoverishment. As we are maintaining the strict hypothesis here that impoverishment is markedness-driven, we thus expect the possibility of a different repair to the same cooccurrence filter. We find a case of breaking as repair in Algonquian pronouns.

In Potawatomi, when the set of morphological features in (63) is generated on the same node, the result is repaired by breaking, in very much the same manner as Arpino Italian above, for phonological features. Specifically, where there are two nodes, [addressee] is sent to the first node, [+author] sent to the second node and [+participant −singular] is kept on both. The pronominal forms for each category are:

(68) Potawatomi Pronouns (Déchaine 1999)

Gloss	Pronoun
1sg	nin
1ex	ninan
2sg	kin
1in	kinan
2pl	kinwa
3sg	win
3pl	winwa

The vocabulary items for the prefixes and suffixes are the following:

(69) a. Prefixal Vocabulary Entries
/k-/ ⇔ [addressee]
/n-/ ⇔ [+participant]
/w-/ ⇔ [−participant]

b. Suffixal Vocabulary Entries
/-an/ ⇔ [+author +participant −singular]

/-wa/ ⇔ [−singular]
/-Ø/ ⇔ [+singular]

As a result of breaking of the inclusive, the "volatile combination" of [addressee] and [+author] on the same node are kept apart, and therefore the following feature sets are present at prefix and suffix:

(70) a. [+participant addressee −singular]$_N$ [+author +participant −singular]$_{N'}$
b. Result after vocabulary insertion: *k*-in-*an*

In a sense, the Potawatomi inclusive is a "constructed inclusive," much like the "constructed duals" of Hopi and Zuni; neither the prefix nor the suffix position alone realizes the set of features in (63), but the union of all of these features does represent inclusive we. The fragmentation of these features into two distinct positions of exponence, which keep apart the marked [+author] and [addressee], is precisely what breaking accomplishes. The constructed duals of Hopi (Noyer 1992; Harley and Ritter 2002) illustrate exactly the same point, although at a phrasal level:

(71) pam **wari**
he ran

(72) **pɨma** yɨʔtɨ
they ran.PL

(73) **pɨma wari**
they ran
"They (two) ran"

The four vocabulary entries are the following:

(74) /pɨma/ ⇔ [−singular]
/pam/ ⇔ [+singular]
/wari/ ⇔ [−augmented]
/yɨʔtɨ/ ⇔ [+augmented]

This pattern is not limited to pronouns: determiners syncretize dual/plural (although nouns do not) as the following examples demonstrate (Jeanne 1978: 73):

(75) miʔ maana **paki**
that.SG girl.SG entered

(76) **mima** mamant yiŋ^{y}a
those girl.PL entered.PL

(77) **mima** maanat **paki**
those girl.DL entered

All pronouns and demonstratives differentiate only [±singular] (Jeanne 1978: 76):

(78)

Gloss	SINGULAR [+singular]	DUAL/PLURAL [−singular]
1	nɨʔ	ʔitam
2	ʔɨm	ʔɨma
3	pam	pɨma
"this"	ʔiʔ	ʔima
"that" (removed)	miʔ	mima

A large number of verbs occur in suppletive pairs, in addition to "enter" and "run" (Jeanne 1978: 87):

(79)

Gloss	SINGULAR/DUAL [−augmented]	PLURAL [+augmented]
die	mooki	soʔa
sleep	pɨɨwi	took^{y}a
exit	yama	nöŋa
stand	wɨnɨ	hooŋ^{y}a
fall	poʔsi	löhö
arrive	pitɨ	ʔöki
eat	tɨɨmoyta	noonova
sit	qatɨ	yeese
climb	wɨɨvi	yayva

Other verbs distinguish plural and non-plural using reduplication, infixation, or suffixation. The fact that all pronouns only distinguish [±singular] and that all verbs only distinguish [±augmented] cannot be taken as accidental properties of the vocabulary items realizing these categories. This systematicity is indicative of a filter against the realization of these features on the same node in pronouns and on verbs (though not nouns). The fact that there is no dedicated dual marker in either pronouns or verbs smacks of a cooccurrence filter. I propose that agreement occurs between the subject pronoun (and in the case of demonstrative–noun pairs, between features of the D^0 head of the subject DP) and the verb, copying [±singular] and [±augmented] from the former to the latter. Notably, Hopi is not a pro-drop language, despite the fact that it is polysynthetic (Gronemeyer 1996). I would like to tentatively propose that the items labeled as pronouns and determiners are the spellout of postsyntactic "breaking" of [±singular] into realization in subject position:

(80) Hopi Breaking Rule
Split the features [±singular] off from verbal agreement onto a separate position of exponence in subject position

Admittedly, the Hopi breaking rule is cumbersomely stated, as this is a phrasal, rather than word-internal case of breaking. An alternative might emerge under the view that the feature [±augmented] is spelled out on the verb as the underlying result of an agreement chain with features on the pronominal subject. In this case one could view the fact that [±singular] is spelled out on the pronoun whereas [±augmented] is spelled out on the verb as a very particular repair to cooccurrence of these features: namely spelling out [±singular] in the head of the chain and [±augmented] in the tail of the chain. This type of repair would resemble the strategy proposed in Bošković (2001), in which the decision to pronounce copied features in the tail of a chain may be forced in order to respect a cooccurrence filter at the head of the chain; in the case he discusses, the cooccurrence filter involves adjacent occurrences of the *wh*-word *šta* "what". Whatever the preferred implementation of Hopi breaking may be, I believe that the similarities of the marked "constructed dual" with the marked "constructed inclusive" above are too similar to pass without an attempt at unification.

11.3.4 *Interim conclusion*

On the view developed here, impoverishment theory emerges as a feature-based formalization of repairs to syntagmatic and paradigmatic configurations involving marked categories. Thus, like phonological neutralization rules that operate as repairs to marked configurations—e.g., [+voice] in obstruents, [+high −ATR], adjacent feature identity (the OCP)—impoverishment rules and breaking rules may be viewed not as arbitrary, but rather as resulting from a comprehensive theory of morphological markedness. In the next section, I turn to some interesting consequences of taking impoverishment as feature deletion extremely seriously.

11.4 Pragmatic effects of φ-deletion

Pursuing the postsyntactic treatment of marked inclusive, in this section I draw attention to some pragmatically surprising uses of the inclusive, which become understandable when viewed in the context of deletion of either marked [+author] or [addressee]. If analyzed as feature deletion, impoverishment becomes much more than a formal expression of contrast neutralization in the strictly morphophonological sense. Consider what happens when the exponent of [+author +participant addressee] is used in scenarios in which its referent is *not* inclusive we. There are two opposite cases to consider.

The first is the Tamil inclusive *naam* as a "super-honorific", which can be used "by lower-status persons to address higher-caste persons" (Brown and Levinson 1987: 202). The second is the Santali inclusive, which can be used when threatening someone (Cysouw 2005: 221). The latter is illustrated below:

(81) daka dɔhɔe-me ar ba-m dɔhɔe-khan-dɔ nãhãk'-laŋ
rice put-2SG and NEG-2SG put-if-TOP just-IN.SJNCT
gɛr-gitic'-gɔtme-a ar boge-te-laŋ thəyə-me-a
bite-lie-2SGO-IND and good-INSTR-IN.SJNCT kick-2SGO-IND
"Put the rice down, and if you don't put it down, I shall just bite you that you lie there, and I shall give you a good kicking"

It is impossible to conceive of these cases as purely morphological; that is, one cannot claim that, for example, in Santali, the subject agreement is syntactically [−author +participant addressee +singular] (normal second person singular) and is transformed, via morphological operations, into [+author +participant addressee −singular] (first person inclusive nonsingular), as the morphological operations are quite irregular—if they can effect this transformation, then they are apparently unbounded in power: switching signs from marked to unmarked, unmarked to marked.

Under the "Y-model" of grammatical computation, adopted here, syntactic computation feeds both LF and PF, which are independent of each other. What we have called impoverishment, and dealt with thus far, have been postsyntactic feature deletion operations on the PF branch. In such cases, given the independence of PF and LF as postsyntactic components, the φ-features that have been deleted in the course of morphophonological computation remain intact on the parallel LF branch. Indeed, Sauerland (this volume), discussing the LF interpretation of φ-features, makes the proposal that a given φ-feature may be marked on the PF branch but unmarked on the LF branch; in particular, he makes this claim for [+singular].[7] Given the existence of distinct LF operations on and markedness of a given φ-feature, and given the existence of PF-branch feature-deletion (namely, impoverishment), there is naturally the logical possibility that the converse may hold as well: features may be deleted on the LF branch, while surviving intact on the PF branch. Such cases have been amply documented, see for example Heim (this volume) on bound pronominal variables in cases such as *Only I did my homework*, which can be analyzed as deletion of [+author +participant] on the LF branch, but clearly not the PF branch. I propose that the cases above are instances of *deprivation*, an LF operation of deleting otherwise interpreted φ-features. Other potential instances of deprivation worth exploring might be instances of second person pronouns used in generic contexts, which could be analyzed as deletion of [−author +participant] on the LF branch, under binding by a (silent) generic operator.

While Heim's cases of deprivation are syntagmatic, occurring under variable-binding, the cases of deprivation discussed here are paradigmatic, and apply to the marked inclusive regardless of interconstituent relations. These cases of deprivation as postsyntactic deletion of a complex (marked) feature set on the LF branch are the analog to impoverishment of the complex feature set on the PF branch observed in Mam above.

While their surface interpretive effects are opposite, Santali and Tamil are similar to each other in that the use of the inclusive displaces a debased participant. In Tamil, the speaker debases themself and uses "you and I" for "I"; in Santali, the speaker debases the hearer and uses "you and I" for "you". Conversely, the superior, non-debased, participant retains their normal identity. What this amounts to, at the pragmatic, or social, level, is a denial of the independent identity of the debased participant: "I am so humbled that I do not even have a will/identity independent of you", "You are so lowly that you do not have a will/identity independent of me". Hence, a grammatical

[7] Though see Krifka (2005), who on the basis of the lack of cardinality presuppositions for Indonesian bare singulars, remarks that the LF-markedness of [+singular] in English may be language-specific. On the contrary, I know of no convincing language-specific case in which [+singular] is PF-marked.

form is chosen that represents the speaker–hearer dyad simultaneously. Pragmatically, this is understood as involving feature deletion of the intrusive argument. For instance, in Santali, the inclusive [+author +participant addressee −singular] φ-agreement is understood as [+author +participant +singular]; this involves deletion of [addressee], therefore reinstating the independence of the author.

11.5 Outlook

The core idea explored above is that the human mind has a unity of design and an economy of mechanism, and thus employs highly similar mechanisms and operates using formally identical principles across two seemingly different domains of data: phonological features and φ-features.

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