UNIVERSITY OF CALIFORNIA, SAN DIEGO

MORPHOLOGICAL FAITHFULNESS TO SYNTACTIC REPRESENTATIONS

A dissertation submitted in partial satisfaction of the requirements for the degree

Doctor of Philosophy

in

Linguistics

by

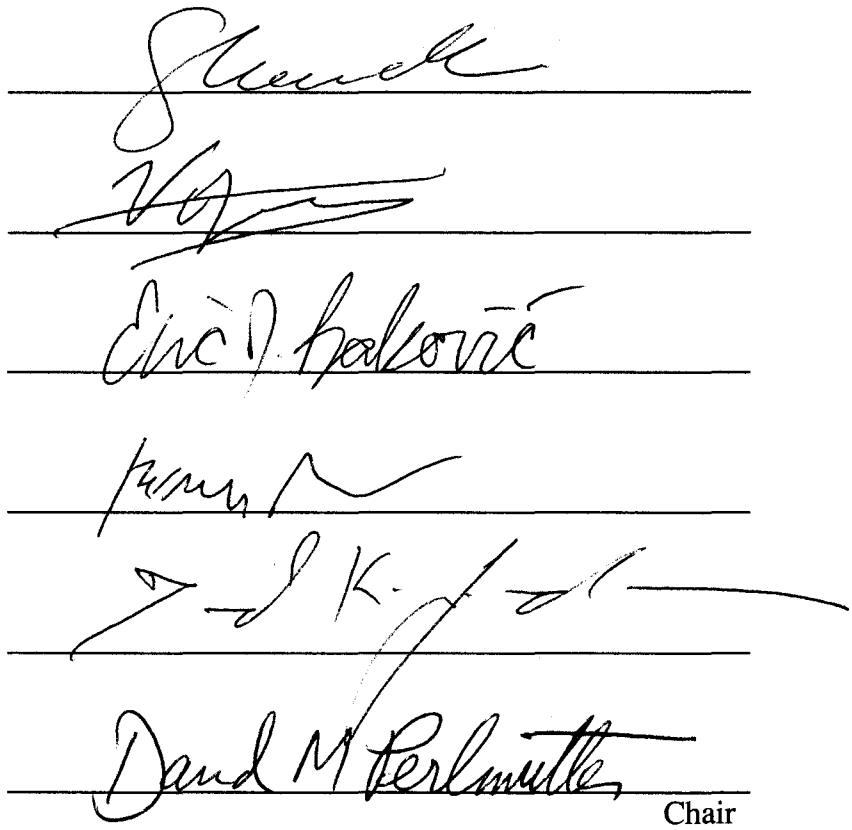
Michael Hughes

Committee in Charge:

Professor David Perlmutter, Chair
Professor Farrell Ackerman
Professor Eric Bakovic
Professor Victor S. Ferreira
Professor David K. Jordan
Professor Sharon Rose

2003

The dissertation of Michael Hughes is approved, and it is acceptable in quality and form for publication on microfilm:



Chair

University of California, San Diego

Table of Contents

List of Tables

Acknowledgements

My sincerest thanks go out to David Perlmutter, who has helped and mentored me in innumerable ways over the last several years. I am especially grateful for his always honest and thoughtful assessment of the drafts of this dissertation, and his patience in shepherding me through its several iterations. Chapters 1 and 4 were done in close collaboration with him. Farrell Ackerman has, since the beginning of my UCSD graduate career, provided a constant source of inspiration and encouragement. Thanks to Sharon Rose for reminding me (often) of the importance of attention to detail. And thanks also to Eric Bakovic for his enthusiasm, accessibility, and straightforwardness.

Professors Ronald Langacker, Robert Kluender, and Chris Barker played important roles early in my graduate work. All of them allowed me to grapple with a number of complex ideas that inform, in one way or another, the work presented in this dissertation.

Thanks to my graduate student colleagues Alicia Muñoz Sánchez, Ezra Van Everbroeck, Paola Nieddu, Linda Godson, Heidi Tonomura, Gina Taranto, Dan Brassil, Robin Thompson, Nitya Sethuraman, and Mieko Ueno for interesting and fruitful discussion on all matter of subjects, and for helping me not take myself too seriously.

To my wife Kristen, thanks for putting up with this seemingly endless project, I could never have done it without you. Sofia and Ernest, thanks for your ability to lighten my heart even on the heaviest of days. Finally, this thesis is dedicated to my Mom and Dad, Kent and Jancie, for encouraging, from the beginning, the spirit of inquiry and curiosity, and also a love of language.

Vita

1990 B.A. Lewis and Clark College

1992 M.A. German. University of California, Davis.

1993 M.A. Linguistics (applied). University of California, Davis.

2003 Ph.D. Linguistics. University of California, San Diego.

ABSTRACT OF THE DISSERTATION

Morphological Faithfulness to Syntactic Representations

by

Michael Hughes

Doctor of Philosophy in Linguistics

University of California, San Diego, 2003

Professor David M. Perlmutter, Chair

This dissertation examines the nature of the syntax-morphology interface by looking at the phenomenon of Concord within the Noun Phrase in three Germanic languages (Swedish, Icelandic, and German). We argue that the Elsewhere Condition, which constitutes the basis of the syntax-morphology interface in a number of theories, is unable to account for several alternations in determiner and adjective inflection found in these languages. We advocate an approach to the interface in which syntactic terminal nodes and inflected words are separate theoretical objects in association with each other. Terminal nodes of syntactic structures consist of bundles

of morphosyntactic features. The output of the lexicon consists of inflected forms, potentially underspecified for morphosyntactic features, which compete for association with a targeted node. We show how morphological blocking effects can be modeled in Optimality Theory in terms of two constraints that enforce faithfulness of inflected forms to the morphosyntactic requirements of the containing syntactic representation. We show, however, that in Icelandic and German it is possible for a less faithful inflected form to beat out a more faithful form under certain circumstances. As a result, we argue that the constraints that form the basis of the interface in most languages need to be augmented to account for the Germanic phenomena. In particular, Icelandic and German provide evidence for a constraint that seeks to maximize the expression of morphosyntactic features across the NP, possibly at the expense of maximal faithful expression of features associated with a given terminal node within the NP. In addition, German requires an economy constraint on the expression of morphosyntactic features within the Adjective Phrase. The proposal is able to account for a number of patterns of inflection that are unaccounted for in previous accounts.

Chapter 1

Theoretical Preliminaries

1.1. Overview.

The goal of this thesis is to investigate properties of the syntax-morphology interface. In order to do this we look at interesting patterns of inflection in three Germanic languages. In particular, we examine patterns of inflection occasioned by NP-internal concord in order to understand the nature of the relationship between properties of syntactic structures and their morphological realizations. *Concord* is the phenomenon whereby nominal heads and their modifiers come to share the same attributes (typically for features for gender, case, and/or number). In general, we seek to determine what theoretical devices are needed to ensure that the right inflected forms surface in the appropriate environments.

The goal of this chapter is to clarify the assumptions about the architecture of the grammar that we want to explore. We first discuss the traditional generative conception of the syntax-morphology interface as involving the spell-out of lexical features in syntactic structures. Then we discuss certain problems for this conception posed by the interaction of phonological considerations with morphological expression of morphosyntactic properties. Next, we discuss the different architectural assumptions that we adopt, and some implications of these assumptions for morphological realization of syntactic properties. We show over the course of the dissertation how this reconceptualization of the syntax-morphology interface allows us

to account for a number of patterns of inflection that are problematic under the traditional approach. Finally, we present a brief overview of the structure of the dissertation.

1.2. A common conception of the syntax-morphology interface.

In most current theories of syntax, the lexicon feeds into the syntactic component. Terminal elements of syntactic structures are typically construed as lexical items with their associated feature structures. These terminal elements project their features into syntactic structures. Thus, for instance, Chomsky (1995) states:

> […] let us assume that, like verbs, nouns are drawn from the lexicon with all of their morphological features, including case and Φ-features, and that these […] must be checked at the appropriate position. (197)

And further:

> On the simplest assumptions, the lexical entry provides, once and for all, the information required for further computations—in particular, for the operations of the phonological component (including morphology, we assume). (239)

This architectural assumption means that concord (featural identity between terminal nodes in an NP) is effected entirely in the syntactic component by some specific syntactic operation, or by means of a well-formedness condition on syntactic structures. Inflection is seen as the 'spell out' (as affixes or other morphological material) of the morphosyntactic features of lexical items in syntactic structures.

Certain morphophonological facts are problematic for this conception, however. These are the topic of the next section.

1.3. Problems caused by the relevance of phonological information.

Perlmutter's (1998) investigation of a phonologically driven alternation of prenominal modifiers in French highlights a problem with the traditional approach to the syntax-morphology interface.

In French, the phonological shape of certain modifiers depends on the shape of the following word. In order to avoid hiatus, the modifier may not be vowel-final if the following word is vowel-initial. When the potential for this situation arises, an alternative, consonant-final form of the modifier surfaces. Typically, however, the alternative consonant-final modifier is the modifier for nouns of the opposing gender. In (1a) we see that since the following word is consonant initial, the feminine form *ma* 'my' can modify the vowel initial head *épée*, 'sword' (the orthographic 'e' at the end of *nouvelle* 'new' is not pronounced). In (1b), despite the fact that the head noun is the same in both phrases, the consonant final modifier *mon* 'my', which is identical to the masculine form, is needed in order to prevent hiatus.[1]

(1) a. **ma** nouvelle épée
my new.fem.sg sword
'my new sword'

b. **mon** épée
my sword
'my sword'

[1] See also Schane (1968), Tranel (1994, 1998), and Mascaró (1996) for discussion of this and similar data.

Perlmutter shows that it is possible to classify the consonant-final modifiers as lexically specified for gender and still account for this alternation (here *ma* is inherently feminine, *mon* inherently masculine). If a phonological constraint (in this case ONSET) is allowed to outrank the syntactic constraints that govern concord, then a morphosyntactic feature clash between modifier and head (masculine modifier, feminine noun) may be allowed *if* the higher-ranked phonological constraint can be satisfied as a result. However, this solution entails abandoning the long established grammatical architecture common to most theories of grammar in which phonological information is irrelevant to syntax (Miller, Pullum & Zwicky, 1992). Furthermore, as Perlmutter points out, allowing phonological constraints to be interleaved with constraints on syntactic structure vastly expands the number of possible grammars, opening up numerous unattested possibilities. Perlmutter[2] proposes a different conception of the syntax-morphology interface whose properties we describe in the next section. We do not discuss phonologically driven alternations like this one in the body of the dissertation. However, the reconceptualization of the interface occasioned by data like (1) will allow us to account for other types of alternations in the languages that we investigate.

1.4. An alternative conception: the Association Theory of the syntax-morphology interface.

We adopt a conception of the syntax-morphology interface based on the ideas of Perlmutter (1997, 1998). The theory is called the *Association Theory* of the syntax-

[2] Class lectures, UCSD Linguistics 248, 1999.

morphology interface. In this section we will first list the main components of this approach. Afterwards we will walk through a schematic example to show how all of these components fit together. We show how the theory can be implemented for larger data sets in the case studies that constitute the body of the thesis.

1.4.1. Key Components of the Association Theory of the syntax-morphology interface.

We list here the basic components of the theory, we discuss each component in greater detail in a subsequent section.

- The independence of Syntax and Inflected forms.

The Association Theory assumes a radical separation between syntactic representations and the output of the lexicon. Lexical items are not ther terminal elements of syntactic representations, and their features are not projected onto syntactic structures. Syntactic terminal nodes and the inflected forms that constitute the output of the lexicon are separate theoretical objects.

- The Role of Syntax.

The syntactic component of the grammar is responsible for ensuring that morphosyntactic features are properly distributed across terminal nodes in a phrase. *Concord* under this approach means that all appropriate terminal nodes of an NP have identical values for concord features (typically features for gender, case, and/or number).

- The Role of the Lexicon.

We assume, as do other theories, that the output of the lexicon consists of inflected forms and their associated morphosyntactic features. Importantly, we also assume that the lexical output for a given lexeme will be its entire paradigm of inflected forms.

- Association and Competition.

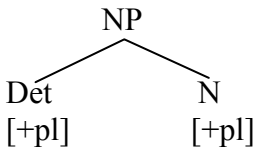
The various inflected forms that constitute the output of the lexicon compete for association with a targeted syntactic terminal node. The competition between forms is mediated by Optimality Theoretic constraints on the association of inflected forms with syntactic terminal nodes. The inflected form which best comports with the constraints for a given terminal node will be selected over the rest of its competitors.

In the next sections we show how the different components of this approach fit together. The main purpose of the following discussion is to exemplify how this system works. We address more complex data and present arguments in favor of the theory in subsequent chapters.

1.4.2. Syntactic Representations.

In this theory terminal nodes of syntactic structures are not lexical items, but bundles of morphosyntactic features. Thus, a syntactic representation will look something like (2) for a plural NP in a language that only shows concord for number. As a matter of expository convenience we omit possible intermediate nodes since they don't play a role in the relationships we are interested in.

(2)



1.4.3. The output of the Lexicon.

The role of the lexicon is to supply candidate word forms that compete for association with syntactic terminal nodes. The output consists of the entire paradigm of the lexeme in question. The hypothetical output of the lexicon for the lexeme THIS is given in (3). The lexical output for the lexeme BOOK is given in (4).

(3) *Lexical output for* THIS.

a. this [-pl] b. these [+pl]

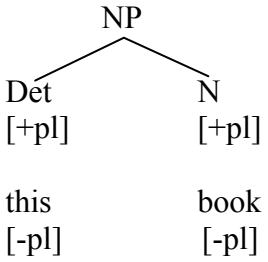
(4) *Lexical output for* BOOK.

a. book [-pl] b. books [+pl]

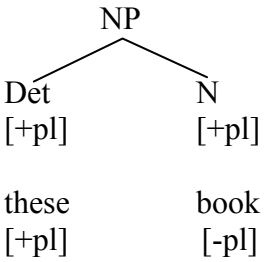
1.4.4. Association and competition.

Inflected lexical items compete for association with a given syntactic terminal terminal node. In our example, the syntactic representation in (2) is paired with the lexical outputs in (3) and (4) to constitute a candidate set. The partial candidate set for these examples is given in (5). Of course, not all of these candidate phrases are equivalent. In (5a-c) the features of at least one of the inflected forms clashes with the features of the syntactic representation.

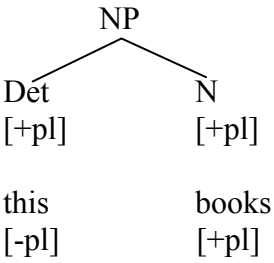
(5) a.



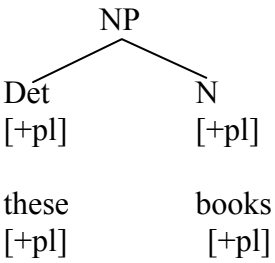
b.



c.



d.



These candidates can now be evaluated by ranked, optimality theoretic constraints on the associations between terminal nodes of syntactic structures and their associated inflected forms. The candidate which fares the best on these constraints is the most harmonic. Identifying and defining the relevant constraints is undertaken in subsequent chapters. Foreshadowing slightly, the candidate in which features of syntactic representations are most faithfully instantiated in associated inflected forms will typically win the competition (though, as we show in chapters three and four, other factors may come into play). In this example, of course, the winning candidate will be (5d), since the features of the terminal nodes do not clash with features of the associated inflected forms.

1.4.5. Summary of the Association Theory of the syntax morphology interface.

In this section we presented the basic properties of the approach to the syntax-morphology interface that we assume in this thesis. We provide arguments for its adoption in subsequent chapters, and show that it can handle a number of alternations that are otherwise problematic. The basic idea is that syntactic representations (and their features) are independent of inflected forms (and their features). The syntactic component is responsible for appropriately distributing morphosyntactic features across the syntactic representation of a phrase. In the case of concord, the head noun and its modifiers must bear identical concord features. The output of the lexicon consists of paradigms of inflected forms and their morphosyntactic features. Syntactic representations and the inflected forms are placed in association with each other, and candidate inflected forms compete for association with the targeted terminal nodes. These associations are evaluated by Optimality Theoretic constraints. We show over the course of the dissertation that these constraints conspire, in most cases, to allow the faithful expression of the greatest number of morphosyntactic properties of the syntactic representation permitted by the lexicon. However, what constitutes the most faithful expression depends both on the number and nature of the applicable constraints, their ranking, and the output of the lexicon. These factors combine to produce a variety of inflectional patterns in the languages under investigation

1.5. Some consequences of the Association Theory.

In this section we discuss three potential implications of adopting this approach to the syntax-morphology interface.

First, phonological constraints may have an impact on how syntactic features are realized morphologically if phonological constraints are interleaved with constraints on the association of syntactic and morphological representations. Since the phonological constraints can affect the association between syntactic representations and lexical items, they have no effect on properties of the syntactic representation proper. Instead, they may affect how features of the syntax are expressed morphologically. We do not, however, consider phonological alternations in this thesis.

A second, but related consequence of this theory is that we can target well-formedness constraints not just at properties of syntactic structures, nor just at morphological properties of inflected items, but at properties of the association between syntactic terminal nodes and inflected forms. That is, we will show that associations between the syntax and lexical form can be subjected to different types of constraints. In other words, some featural differences between syntactic representations and inflected forms are more permissible than others. In Optimality Theory terms, some of the constraints will take precedence over others. In any case, the constraints on the association of syntax and lexical form will have nothing to say about the well-formedness *per se* of either the syntactic structures or the

morphological ones. The constraints are concerned with how well the items fit together.

Finally, under this approach it is possible that morphosyntactic properties of one inflected form can have an effect on the form of a co-constituent. This sort of situation is common in a number of Germanic languages. The examples in (6) are from German. The neuter singular suffix /-es/ (in boldface) surfaces on the quantifier in (6a), but on the attributive adjective in (6b) despite the fact that both NPs are neuter non-oblique singular. By the same token, the form of the attributive adjective *deutsch* 'German' is different in what appear to be identical morphosyntactic contexts. If the morphosyntactic features of these phrases are the same, how can the grammar select the right form for the right terminal node?

(6) a. manch-**es** deutsch-e Bier *neuter nom/acc singular*
some-nt.sg German beer
'some German beer'

b. ein deutsch-**es** Bier *neuter nom/acc singular*
a German-nt.sg beer
'a German beer'

As we show in subsequent chapters, with the Association Theory we can account for these and similar facts without having to claim that the syntactic features associated with the attributive adjective's terminal node differ in the two phrases in (6). Instead, the two phrases satisfy constraints on morphosyntactic association in different ways.

1.6. Summary.

In this thesis we adopt the Association Theory of the syntax-morphology interface. Under this approach, syntactic terminal nodes and morphological representations constitute independent theoretical objects. Terminal nodes of syntactic representations are in association with inflected forms that constitute the output of the lexicon. Which of a lexeme's inflected forms constitutes the optimal morphological expression of the concord properties of a given syntactic node is determined through the interaction of optimality theoretic constraints on the association of syntactic and morphological representations, and the interaction of these constraints with morphosyntactic properties of the inflected items themselves. We examine the precise nature of the morphological representations and the constraints that regulate their appearance in the body of this thesis. We will show that by adopting the Association Theory we can account for a number of patterns of inflection that are otherwise difficult to explain.

1.8. Organization of the dissertation.

In Chapter 2 we discuss the nature of morphosyntactic representations and their relationship to syntactic properties based on patterns of inflection in Swedish NPs. We argue that the inflected forms that constitute the output of the lexicon may be underspecified for morphosyntactic features. In addition, we illustrate the constraints that appear to be basic to the syntax-morphology interface. These demand that the morphosyntactic information of syntactic representations be faithfully

expressed in the morphology of the phrase. However, complete faithfulness is by no means the only strategy available to the grammar (i.e. it is not always the case that every relevant morphosyntactic feature of a phrase in the syntax is morphologically expressed).

In chapter 3 we examine the intricate patterns of inflection in Icelandic, and show how morphosyntactic properties of the whole NP can figure into the faithful expression of concord features. We argue that the basic interface constraints developed in chapter 2 have to be supplemented to account for Icelandic.

In chapter 4 we discuss the well-known German strong-weak adjective alternation, and consider additional factors that may interfere in the faithful morphological expression of features of individual terminal nodes. Nonetheless, these deviations from the most faithful possible expression of syntactic features contribute in interesting ways towards the expression of morphosyntactic properties of the entire phrase, and towards the disambiguation of inflected forms in syntactic constructions.

In chapter 5 we discuss the key properties of the analyses that we present, and connections with other aspects of linguistic theory.

Chapter 2

Elsewhere in Morphosyntax

2.1. Introduction.

A discussion of Swedish adjective inflection is a good place to begin our investigation of the morphology-syntax interface. Although the Swedish adjective paradigm is relatively simple, it exemplifies a number of issues that are important to understanding the nature of the interface, as well as the more complex paradigms of Icelandic and German. A principal goal of this chapter is to lay the groundwork for discussion of inflectional patterns found in those languages. We discuss properties of concord in general, and of inflected words in detail. We argue that while syntactic representations should be fully specified for morphosyntactic properties, inflected forms needn't be. Then we discuss what implications these considerations have for the morphology-syntax interface. We argue that some form of morphological blocking (Kiparsky, 1973, Andrews 1990) functions as the basis of the interface, and show how it can be modeled in Optimality Theory.

2.2. What is Concord?

Concord can be broadly characterized as the morphological expression of morphosyntactic properties of a Noun Phrase on its sub-constituents. Very often, these properties are expressed by means of the same morphology on the head noun and its modifiers. Spanish provides a good example of such a concord pattern. In (1),

each sub-constituent of the NP (specifier, noun, and adjective) unambiguously expresses the morphosyntactic properties of gender (feminine) and number (plural) .[1]

(1) l-a-s palabr-a-s cort-a-s *Spanish*

the-fem-pl word-fem-pl short-fem-pl

'the short words.'

In most Germanic languages, however, concord is not necessarily uniformly expressed across the NP. While it is possible for the same suffix to appear on modifiers, as in (2), concord suffixes may vary from one constituent to the next. In the Swedish example in (3), The definite determiner bears one suffix, while the adjective *stor*, 'big', bears another. Both phrases are neuter singular.

(2) et-t **stor-t** hus *Swedish*

a-neuter big-neuter house

'a big house.'

(3) de-t **stor-a** hus-e-t

the-neuter big house-the-neuter

'the big house.'

It is also possible for the same sub-constituent to bear different concord morphology in identical morphosyntactic environments. This phenomenon occurs, for example, in German. Both Noun Phrases in (4) are neuter nominative singular, but in (4a) the adjective bears the suffix /-es/, while the same adjective bears the suffix /-e/ in (4b).

[1] The example in (1) is the most common pattern in Spanish. For discussion of morphosyntactic properties of Spanish NPs, see Harris 1991, or Lloret and Viaplana 1997.

(4) a. ein **gut-es** Haus *German*

a good-neut.sg house

'a good house.'

b. dies-es **gut-e** Haus

this-neut.sg good house.

'this good house.'

Examples like those in (2-4) raise a number of questions. For instance, are the different suffixes alternative expressions of the same morphosyntactic content? Or, can different sub-constituents express different subsets of morphosyntactic properties? If the latter is the case, are there any principles that determine what features can be expressed where? What adjustments need to be made to a theory of concord to account for such distributed agreement? How much of the phenomenon should be attributed to syntactic properties of the phrases involved, and how much to morphological properties of the words (or types of words) that constitute the phrase? And finally, given the range of variation in concord, to what extent, if at all, can concord receive a universal characterization?

In this chapter we are principally concerned with the earlier questions regarding how much morphosyntactic information concord suffixes can express, and with the best way to represent the morphosyntactic properties associated with words that display concord morphology. Swedish is a suitable starting point for our discussion of concord, since it has a relatively simple concord paradigm that nonetheless allows for alternations of the sort just discussed that shed light both on the

morphology of concord, and on the morphology-syntax interface. Furthermore, several aspects of the Swedish alternation are mirrored in the more complex paradigms of Icelandic and German that form the basis of later discussion. Understanding the issues as they pertain to Swedish should facilitate our discussion in later chapters.

In the next section we describe the inflection patterns found in the Swedish NP, and provide the key generalizations that have to be accounted for. Next, we show that the alternation is, in fact, attributable to concord, rather than to some other syntactic mechanism. Having discussed these issues in detail, we move on to the question of how much morphosyntactic information has to be associated with inflected forms. Finally, we provide an account of Swedish concord that serves both as the basis of a universal characterization of the phenomenon, and as a point of departure for discussion of more involved alternations found in German and Icelandic.

2.3. Swedish Concord: Generalizations.

Swedish determiners and adjectives alternate according to gender (common *vs.* neuter) and number (singular *vs*. plural). In addition, as we will show, Swedish enforces concord for the definiteness status of NPs. We will focus our attention on adjectives for expository reasons, but the account provided extends straightforwardly to determiners as well.

Swedish adjectives surface in one of three phonological forms, exemplified by *stor* 'big' in (5). These inflected forms are typically referred to as *strong* and *weak*

forms. The strong forms are gender-specific, whereas the weak inflected form may occur with nouns of either gender.

(5) Inflected forms of Swedish *stor* 'big'.

Strong

common: ***stor***

neuter: ***stort***

Weak ***stora***

The generalizations concerning the distribution of inflected adjective forms are these:

Generalization 1: Strong (gender-specific) adjectives occur in singular indefinite NPs. Examples are given in (6). [2]

(6) a. ett **stort** hus

a.nt big.nt house

'a big house.'

b. en **stor** gris

a.cm big.cm pig

'a big pig.'

Generalization 2: Strong (gender-specific) adjectives occur in singular predicate position, as shown in (7).

[2] Abbreviations: cm: common gender, nt: neuter gender. Attributive adjectives are in **boldface**.

(7) a. hus-et är **stort**

house-the.nt is big.nt

'the house is big.'

b. gris-en är **stor**

pig-the.cm is big.cm

'the pig is big.'

Generalization 3: The weak form occurs in singular definite NPs, as shown in (8). [3]

(8) a. det **stora** / ***stort** hus-et

the.nt big / big.nt house-the.nt

'the big house.'

b. den **stora** / ***stor** gris-en

the.cm big big.cm pig-the.cm

'the big pig.'

Generalization 4: The weak form occurs in *all* plural contexts, both attributive and predicate, as in (9).

(9) a. hus-en är **stora** / ***stort**

house-the.pl is big / big.nt

'the houses are big.'

[3] The definite determiner in Swedish is a suffix of the form /-en/, or /-et/. When the head noun is modified by an adjective, a second, so-called 'adjective article' appears phrase initially. We do not attempt to account for its presence or absence here, but see Börjars (1998) for an account of this phenomenon in Swedish, and Börjars and Donohue (2000) and Hankamer and Mikkelsen (2002) for accounts of similar phenomena in Danish.

b. gris-ar-na är **stora** / ***stor**

pig-pl-the are big / big.cm

'the pigs are big.'

c. de **stora** / ***stort** hus-en.

the big / big.nt house-the.pl.nt

'the big houses.'

d. de **stora** / ***stor** gris-ar-na

the big / big.cm pig.pl.the.cm.pl

'the big pigs.'

e. **stora / *stor** gris-ar

big / big.cm pig.pl

'big pigs.'

f. **stora** / ***stort** hus

big / big.nt house.pl

'big houses.'

Generalizations 1-4 above, regarding inflected adjective forms in Swedish, can be reduced to the following two statements (on the assumption that predicate contexts count as indefinite):

(10) **Generalizations** (simplified).

a. Strong forms occur in singular indefinite contexts.

b. Weak forms occur elsewhere.

These generalizations necessarily refer to *definiteness*. In the next section we provide arguments that Swedish modifiers in the NP show concord for definiteness/indefiniteness. After we examine the arguments for including definiteness among the concord categories, we turn to a discussion of the best way to characterize the morphological information associated with inflected Swedish adjectives. We will look at the consequences of requiring a unique morphological representation for each syntactic context by means of full specification of morphosyntactic features. After that we will look at the possibilities for streamlining these representations through underspecification. We show that the underspecified representations yield a superior account of the Swedish adjective paradigm and patterns of inflection in terms of how many suffixes are needed, and which generalizations can be captured.

2.4. Concord for definiteness.

Cross-linguistically, the most common concord categories are *gender, case*, and *number* (Zwicky 1985, Lapointe 1988). In this section we argue that the alternation in adjective form in Swedish is attributable, in part, to concord for definiteness rather than to something else. Practically speaking, we propose that there is a morphosyntactic feature for definiteness in Swedish on a par with features for gender and number. The syntax needs to ensure that the terminal nodes of the head noun and its modifiers are identical with respect to concord features for gender,

number, and definiteness. In the next sections we show why a concord account is preferable to the alternative.

2.4.1. What does it mean to be *Definite*?

There is no widely agreed upon definition of what it means for a noun phrase to be definite. Following Hawkins (1978), Lambrecht (1994), and Lyons (1999), we assume that a definite NP is one whose referent is identifiable by both speaker and hearer, and which is unique in the sphere of discourse. For present purposes, a more precise definition is not needed. We are dealing not with a semantic category *per se*, but with the grammaticalization of that category. Though morphological definiteness and discourse-semantic definiteness coincide in the overwhelming number of cases, whether or not definiteness is morphologically expressed depends primarily on properties of words or word types found in the NP.[4] We discuss the relevant properties of definite and indefinite NPs in the following sections.

2.4.2. Specifiers and the Adjective alternation.

In section 2.3 we saw that strong adjectives surface when in construction with the indefinite article, or, in the case of mass nouns, potentially with no article at all. Similarly, weak adjectives co-occur with the definite article. However, there are a number of other quantifiers that occur with adjectives of only one inflection type

[4] Thus, an NP may have generic reference, but nonetheless condition definite morphology: *Ekorren finns överallt i Europa* 'The squirrel is found all over Europe' (Holmes and Hinchcliffe, 1994:67). Natural gender and grammatical gender are often similarly dissociated in specific contexts (cf. German *das Weib* 'the woman.neuter', and *die Frau* 'the woman.feminine').

(strong vs. weak) in the singular. Table 2.1 lists the quantifiers that co-occur exclusively with strong adjectives in the singular.

Table 2.1. Swedish indefinite specifiers.

Common	Neuter
indefinite article:	
en 'a/an'	ett 'a/an'
indefinite quantifiers:	
någon 'some'	något 'some'
ingen 'no'	inget 'no'
varannan 'every other'	vartannat 'every other'
all 'all'	allt 'all'
varje 'every'	varje 'every'
varenda 'every'	varenda 'every'
många 'many'	många 'many'

Table 2.2. Swedish definite specifiers

common	neuter
definite article	
den stora grisen 'the big pig'	det stora huset 'the big house'
possessives:	
min vackra flickvän 'my beautiful girlfriend.'	mitt stora hus 'my big house'
demonstratives:	
denna mörka skog 'this dark wood'	detta vackra träd 'this beautiful tree'
various others: samma 'the same' (samma dumma fråga - 'the same silly question') nästa 'the next' (nästa fina helg - 'the next fine weekend') föregående 'the previous' (föregående dag - 'the previous day') följande 'the following' vederbörande 'the person concerned'	

Table 2.2 lists the determiners and quantifiers which surface exclusively with weakly inflected adjectives in the singular. Comparison of the two tables reveals a clear difference between the two groups of quantifiers. The quantifiers in table 2.1

occur in NPs that do not refer to individually identifiable referents. The quantifiers in table 2.2 indicate that the referent of the NP is unique in the scope of discourse. The determiners and quantifiers in Table 2.2 correlate strongly with the quantifier types identified in Lyons (1999: 15-32) as definite quantifiers. It appears, then, that quantifiers and determiners in Swedish can be sorted into two classes, *definite* and *indefinite*, based on both semantic and morphological grounds.

Given the way these two sets of quantifiers correlate with the definiteness of NPs, it seems clear that an analysis in which definiteness plays a key role is at least plausible. However, it might also be possible to provide an analysis which does not specifically refer to definiteness, but relies on (synchronically) arbitrary classes of quantifiers which select for a specific inflection type on adjectives. In the next section we show what each sort of analysis would look like.

2.4.3. Concord for definiteness.

One way to account for the adjective alternation described above is to include a feature for definiteness among the concord features of Swedish. This would simply involve positing a feature for definiteness and treating it on a par with features for gender and number. As we discussed in chapter 1, this means that the syntactic component would have to ensure that each eligible node in the NP is appropriately specified for this feature in the appropriate contexts so that the feature can receive morphological expression.

However, since definiteness is not common, cross-linguistically, as a concord feature, and given that the presence of certain determiners seems to correlate with the appearance of different adjective inflection types, perhaps another analysis is preferable; we outline such an approach in the next section.

2.4.4. An alternative to concord for definiteness: the Subcategorization approach.

We noted above that adjective morphology (strong or weak) correlates strongly with NP specifier type. One can therefore also propose an analysis of this phenomenon according to which the form of the adjective is dictated by the co-occurring specifier, rather than by concord.[5] Since weak adjectives typically occur with definite specifiers, it might be possible to account for their appearance in NPs by assigning a diacritic feature to the adjective suffix, and letting this feature be selected for by the appropriate class of specifiers. Thus, the lexical entry of a definite specifier like the possessive adjective *min* 'my' might contain a subcategorization frame along the lines of (11a). By including a diacritic feature like [-strong] in the lexical entry for the weak suffix, as suggested in (11b), we could get the right distribution of adjective types. Any time a specifier with a subcategorization frame like the one in (11) occurred in an NP, co-occurring adjectives would have to bear (at least) the feature [-strong]. This mechanism would have to override concord, which is still necessary to account for the *stor~stora* alternation.

[5] Alternatively, we might say that inflected adjectives select for a specific class of determiner. The basic mechanism is the same in either conceptualization, and the arguments adduced here apply in either case.

(11) a. *min*: MY < __ ($Adj_{[-strong]}$) N>

b. /-a/: [Adj___]. [-strong]

(12) *min stora gris*

my big pig

In sum, the alternation could potentially be accounted for if we allowed one of the items (adjective or specifier) to override concord and dictate the form of its phrasal companion. We argue in the next sections that the concord analysis is preferable to the subcategorization approach for a number of reasons. We summarize the basic components of each approach in table 2.3.

Table 2.3. Concord vs. Subcategorization for definiteness.

The concord approach	*The subcategorization approach*
• add a feature for definiteness to the list of concord features (along with features for gender and number) • require that syntactic terminal nodes in the same NP have identical values for this feature.	• propose a morphological-form feature associated with weak adjectives. • posit two classes of specifier in the lexicon. • one class of specifier selects for the form feature in co-occurring adjectives.

2.4.3.1. Argument A: both adjective types occur without determiners.

In order to implement the subcategorization analysis, we would have to set up the strong adjective forms as the default instantiation for adjectives, since the strong form of the adjective can occur in NPs lacking any (overt) quantifier. Examples are given in (13). Since there is no specifier in the NP, the strong form could not be selected by a specifier.

(13) a. **god** mat

good.cm food

'good food'

b. **gott** vin

good.nt wine

However, it is also the case that weak adjectives can occur in NPs lacking determiners. For example, weak forms can occur in the plural, without a lexical specifier, as in (14):

(14) **goda** äpple-n

good.wk apple-pl

'good apples'

Of course, this could simply be a case of homophony. That is, there could be different, homophonous /-a/ suffixes for the singular and plural. Importantly, though, there are also two singular contexts in which the weak form appears without a lexical specifier. Weak forms occur in phrases specified by genitive NPs, as in (15), and weak forms may also be used in conjunction with proper nouns, as in (16) (Holmes and Hincliffe 1994).

(15) Svenssons **nya** bil.

Svensson.gen new car

'Svensson's new car.'

(16) **gamla** herr Svensson

old Mr. Svensson

'old Mr Svensson.'

Comparison of the examples in (13) with the examples in (15 & 16) shows that both adjective types can appear in NPs lacking specifiers. This fact is clearly problematic for any account that relies on the co-occurrence of determiners and weak adjective forms. In order to explain the appearance of weak morphology in (15-16), the subcategorization approach would have to posit a phonologically null specifier that selected for the appropriate adjective form.

Given that both adjective types can occur without specifiers, it is not possible to construct an account whereby specifiers force the appearance of weak morphology without introducing additional devices. A concord analysis does not encounter similar difficulty. If the NP types above are classified as *definite NPs*, then nothing more needs to be said to account for these data under a concord analysis.[6] The syntactic terminal nodes of NPs like those in (13-16) have to be specified for the definiteness feature, which can then be reflected in the morphology of the sub-constituents of the NP (just as gender features are expressed).

2.4.3.2. Argument B: Subcategorization does not provide a simpler grammar.

Even if we were able to account for all of the data via some method other than concord, it is not clear that such a move results in a simpler grammar. As we noted in

[6] Definiteness, then, can be required either by discourse factors (uniqueness and identifiablity), or by choice of specifier. See Kathol (1999) or Wechsler and Zlatić (forthcoming) for recent discussion of similar wrinkles in semantic and morphological correspondences.

the previous section, a subcategorization approach would require that specifiers be able to select morphological properties of co-occurring adjectives via subcategorization or some other syntactic process. And it requires an *ad hoc* feature (e.g. [-strong] in (11a, b)) to be the target of that process. In addition, in order to account for phrases like (15 & 16) in which weak forms surface with no lexical determiner, we would need to posit a special device, like a null determiner, to select the correct form of the adjective. The lexical entry for such a determiner might look like (17b), following the pattern of other specifiers in this class. Note that all of this machinery is required in addition to concord, since we need to account for the gender and number based alternations of both specifier and adjective forms in indefinite NPs.

(17) a. *min*: Det, MY, < __ ($Adj_{[-strong]}$) N>

b. *Ø*: Det, < __ ($Adj_{[-strong]}$) N>

A concord analysis, on the other hand requires that a feature for definiteness be included in the set of concord features. Whatever mechanism enforces concord has to be present in the grammar of Swedish NPs anyway, to enforce number distinctions and gender distinctions found on specifiers in singular contexts and adjectives in indefinite singular contexts. Hence both approaches require adding a feature to the grammar, but the subcategorization analysis requires adding or extending syntactic mechanisms as well. In sum, the subcategorization approach needs some special mechanisms to account for NPs lacking specifiers, and still has to rely on concord to capture some of the relevant generalizations. Adoption of concord for definiteness

leads to a simpler grammar, requiring only that the grammar recognize phrases like those in (15) and (16) as definite NPs.

2.4.3.3. Argument C: Under the concord analysis, the two classes of specifiers are not arbitrary.

Finally, adopting a subcategorization approach to this problem offers no real insight into the observed patterns of inflection. Why is the alternation sensitive to precisely those classes of determiners identified in table 2.1 and 2.2 above? Why not some other division into two, or three classes? That is, under a subcategorization approach there is no necessary connection between the morphosyntactic properties of the NPs in question and the class of determiners that conditions the alternation. The fact that indefinite specifiers co-occur with strong forms and that definite specifiers co-occur with weak adjective forms appears to be a purely accidental property of the language. If all that matters is that a specifier select for a given class of adjective inflection, there is no obvious reason why indefinite specifiers pattern alike, or that the classes don't consist of some definite and some indefinite specifiers. A concord analysis, on the other hand, recognizes the strong correlation between NP definiteness and morphological form.

2.4.4. Summary.

We have argued that specifiers in Swedish can plausibly be divided into *definite* and *indefinite* specifiers, and that this distinction is grammaticalized in

Swedish so that a feature for definiteness is included in the list of concord features. We explored an alternative hypothesis that this alternation could be attributed to some mechanism other than concord, whereby one element of the NP (the specifier) chooses the form of a co-constituent (the adjective). However, given that each suffix type can occur in NPs lacking any sort of specifier, a subcategorization analysis cannot account for all of the data. In addition, the subcategorization approach is no simpler than a concord approach. Finally, the concord approach doesn't rely on arbitrary classes of specifiers to force the alternation, the alternation is instead tied to definiteness.

2.5. Morphosyntactic properties of words.

In the previous sections we argued that inflection in the Swedish NP depends on three morphosyntactic categories: gender, number, and definiteness. Each of these categories consists of a binary opposition, so a single concord feature is needed for each category. As a first pass, let's assume that the features in (18) constitute an appropriate characterization of Swedish concord features.

(18) GENDER: [+/- neuter]

NUMBER: [+/- plural]

DEFINITENESS: [+/- definite]

The attributes in (18) combine to describe eight morphosyntactic environments, but as the paradigm in table 2.4 shows, only three phonological forms are available to fill out the paradigm.

Table 2.4. Features in the Swedish Adjective Paradigm.

[-plural]		[+plural]		
stor	*stora*	*stora*	*stora*	[-neuter]
stort	*stora*	*stora*	*stora*	[+neuter]
[-definite]	[+definite]	[-definite]	[+definite]	

The question these data raise is: how are the morphosyntactic features parceled out among inflected forms in syntactic constructions? Is there a unique inflected form for each possible morphosyntactic environment (i.e. is there a morphosyntactic representation corresponding to each cell in the paradigm in table 2.4)? Or, is it possible that the same inflected form can surface in more than one morphosyntactic context (i.e. can a single morphosyntactic representation occupy more than one cell in the paradigm in table 2.4)? Another way of asking these questions is: does an inflected form in some syntactic context have to be fully specified for all concord features, or is it possible for an inflected form to be an exponent of only a subset of the morphosyntactic features that describe the containing NP, and be unspecified for others? In the next sections we first describe what the competing approaches would look like. Then we briefly argue in favor of the position that inflected items may be underspecified for morphosyntactic properties. Following this discussion we discuss the implications of each approach for the morphology/syntax interface.

2.5.1. Full Specification.

The main appeal of the full-specification approach is its conceptual simplicity: there is a unique (underlying) morphological representation for every syntactic

context. Furthermore, as we discuss below, full specification of inflected forms also yields a simple morphology-syntax interface, since there is never any ambiguity about which inflected form can occupy a given position in a phrase. The main drawbacks to this approach are that full specification yields a more complex lexicon, and fails to capture interesting generalizations about the distribution of inflected forms in a paradigm. Let's see what we would have to say about the Swedish adjective paradigm if we were to adopt full specification.

Given the feature set proposed in (18), a full-specification grammar of Swedish would require that the adjective paradigm contain the eight distinct morphosyntactic representations for suffixes in table 2.5 (mirroring the paradigm from table 2.4).

Table 2.5. The Swedish Adjective Paradigm (full specification).

-Ø [-neuter] [-plural] [-definite]	*-a* [-neuter] [-plural] [+definite]	*-a* [-neuter] [+plural] [-definite]	*-a* [-neuter] [+plural] [+definite]
-t [+neuter] [-plural] [-definite]	*-a* [+neuter] [-plural] [+definite]	*-a* [+neuter] [+plural] [-definite]	*-a* [+neuter] [+plural] [+definite]

Once we have established the paradigm in table 2.5, very little more can or need be said about the Swedish adjective alternation if we rely on full specification. The only thing we need to say about the morphology-syntax interface, then, is that there can be no feature clash between syntactic terminal nodes and the morphosyntactic specifications associated with the inflected forms that fill them.

In the next section we discuss what the underspecification analysis looks like. After we have discussed the details of an underspecified Swedish adjective paradigm,

we compare the two approaches. Next we discuss in more detail the implications each approach has for the morphology-syntax interface.

2.5.2. Underspecification.

An alternative to full specification is underspecification of morphosyntactic representations.[7] This approach allows us to leave a given morphosyntactic property out of morphosyntactic representations when the presence of that feature is not necessary to preserve a contrast in the paradigm. More concretely, there are two reasons why we might like to leave the value for some feature unspecified. In the first instance, an attribute may be redundant on one form if the opposing value for the attribute in question appears on some other form in the paradigm. In the second instance, the 'same' desinence may appear in both [+F] and [-F] environments. There is then no contrast along that dimension of the paradigm, and the feature need not be specified. We show how this works with Swedish.

We can utilize the same morphosyntactic features to describe the morphosyntactic properties of Swedish NPs in the underspecification approach as were used in the full specification approach. These are repeated in (19).

---

[7] Phonologists distinguish *radical underspecification* (Archangeli,1988a, b, Mohanan, 1991) from *contrastive specification* (Steriade 1987, Harris, 1991). The former position holds that a feature is unspecified just in case its value can be predicted from other properties of the segment (in the English vowel system, the value of [round] can be predicted from the value of [back]). According to the latter position, features are assigned values where necessary to preserve contrasts within a paradigm. We adopt contrastive specification, insofar as the values of one morphosyntactic feature tend to not be predictive of values for other features (e.g. knowing that a NP is accusative doesn't affect its value for gender features nor *vice versa*). See also Blevins (1995, 2000), and Börjars and Donohue (2000) for a discussion of morphosyntactic underspecification.

(19) Gender: [+/- neuter]

Number: [+/- plural]

Definiteness: [+/- definite]

Unless there is evidence to suggest otherwise, we assume that the forms most restricted in their distribution will also be the most morphosyntactically marked forms in a paradigm (i.e. the forms associated with the most morphosyntactic features).

Thus we'll start by determining the concord properties of the strong forms (*stor* & *stort*). Recall, these forms only show up in singular indefinite contexts. Both forms contrast with the weak form (*stora*) for number and definiteness. That is, holding the other attributes constant, where a strong form surfaces in the singular, the weak form surfaces in the plural. This fact suggests that either the strong forms or the weak form must be marked for number. Since the weak form shows up in both singular and plural environments, we assign the number feature to the strong forms *stor* and *stort* (which occur exclusively in singular environments).

Similarly, strong forms are prohibited from surfacing in definite environments, but the weak form surfaces in either definite or indefinite NPs. Again, we assign the feature to the strong forms. The two strong forms contrast with each other for gender, but only one of the forms has to be marked since marking both forms for gender would be redundant. The choice of which form to mark is somewhat arbitrary where a single opposition exists. We call the gender feature [neuter], since neuter nouns are less frequent than common gender nouns due to the fact that this common gender arose as a result of a diachronic conflation of masculine and feminine classes. These

considerations lead to the morphosyntactic representations for the two strong forms given in (20).

(20) a. *stort*

[+ neuter]

[- plural]

[- definite]

b. *stor*

[- plural]

[- definite]

Deciding on features for the weak form (*stora*) is only slightly more complex, since the environments in which the *a*-form occurs do not constitute a natural class. That is, *except for the empty set, no subset of the morphosyntactic features given in (19) is common to all contexts in which the /-a/ suffix can surface*. More specifically, the weak form is compatible with either value of any feature, in some context, as shown in (21).

(21) *The weak suffix is compatible with all feature values.*

[+ definite]	[- definite]
det ***stora*** *huset*	*nagra* ***stora*** *hus*
'the big house'	'some big houses'

[+ neuter]	[-neuter]
det ***stora*** *huset*	*den* ***stora*** *grisen*
'the big house'	'the big pig'

[+plural]	[-plural]
de ***stora*** *grisarna*	*den* ***stora*** *grisen*
'the big pigs'	'the big pig'

Thus, there appears to be no set of features that characterizes all uses of the form, since any value assigned to the form will necessarily conflict with some context in which the weak form appears.

One possibility in this situation would be to rely on homophony, by positing, for example, two /-a/ forms: one plural form, and one definite singular form. However, this is not necessary. Instead, we can simply leave the suffix /-a/ completely unspecified for *any* morphosyntactic features. This approach yields the paradigm in (22) for Swedish, consisting of only three forms. It is important to note that all of the features associated with these forms are *morphosyntactic* features. We are not positing any feature like [+/- strong] that differentiates between adjective type. Under this analysis the distinction between strong and weak inflection is purely descriptive. The notion *strong* or *weak* plays no role in the analysis.

(22)

a. *stort*	b. *stor*	c. *stora*
[+ neuter]	[- plural]	
[- plural]	[- definite]	
[- definite]		

In sum, the underspecification approach allows us to posit only three forms in the Swedish adjective paradigm. The strong forms, being most restricted in their occurrence, are also the most morphosyntactically specific forms. The weak form has no morphosyntactic concord properties because it is compatible with either value of all three attributes. Assigning the weak form a value for some property would improperly prevent it from occurring in NPs with the opposite characterization. In the next

section we compare these two approaches to morphosyntactic marking. Following that discussion, we look at what implications each approach has for the morphology-syntax interface.

2.6. Comparison of the approaches.

2.6.1. Full Specification is less economical.

Full specification required that the lexicon produce eight distinct forms for the Swedish adjective paradigm. This stands in contrast to the three forms required by underspecification. Even in a relatively simple paradigm like this one, then, underspecification can yield considerable economy compared to full specification. This observation holds regardless of one's view of word formation. That is, the lexicon would either contain eight distinct word-formation rules (following Aronoff (1976), Anderson (1992), or Stump (2001)), or eight distinct suffixes (following DiSciullo &Williams (1987) or Lieber (1992)). The potential savings to be gained in the number of distinct lexical outputs increases with the number of cells in the paradigm, as we show in subsequent chapters.

2.6.2. Full Specification fails to capture the appropriate generalizations.

Recall the generalizations over the Swedish adjective alternation we arrived at in section 2 (repeated here as (23)). Note that the underspecification proposal captures these generalizations quite nicely. There are two strong forms to which (23a) applies, and a single weak form, whose distribution is described by (23b).

(23) *Generalizations.*

a. Strong forms occur in singular indefinite contexts.

b. Weak forms occur elsewhere.

These generalizations follow directly from the morphosyntactic properties ascribed to the inflected forms under the underspecification analysis. The strong forms (*stor, stort*) are the more specific ones, each of which is specified for the environments in (23a). Furthermore, the underspecification captures the default quality of the weak form expressed in (23b), which lacks any features, and is hence compatible with the 'elsewhere' environment.

If we choose full specification, however, the statements in (23) do not follow from any property of the Swedish paradigm. The distribution of the different inflected forms appears to be completely accidental. Thus, the Swedish paradigm could be quite different from the way it is, and the full-specification analysis would remain the same. That is, the same specifications would be required under full specification even if the Swedish paradigm were filled by eight phonologically distinct forms, rather than just three.

2.7. Interface issues.

In this section we show what has to be said about the morphology-syntax interface under the different marking schemes.

2.7.1. Full Specification and NO CLASH.

As we noted above, the principal attraction of the full-specification approach is its conceptual simplicity. As we saw above, it is not difficult to apportion features within a paradigm. The full-specification approach also allows for a simple interface with the syntax. Since there is a unique morphosyntactic representation for every syntactic context, the only condition we need to place on the interface is that morphosyntactic properties of inflected words not clash with the properties of the containing NP.

(24) The NO CLASH condition.

A feature of an inflected form must correspond to an identical feature in the syntactic representation.

Since there is always a form that matches the syntactic context, any clashing feature is enough to suppress a candidate word form.

2.7.2. The problem with underspecification.

We noted above that underspecification is superior to full specification in terms of economy in the lexicon, and in terms of how well paradigmatic relationships can be described. However, the simple prohibition against feature clash that is sufficient to regulate the morphology-syntax interface in full specification cannot account for all of the data if we permit the output of the lexicon to contain underspecified morphosyntactic representations.

Just prohibiting feature clash won't work because underspecification permits more than one inflected form to be compatible with the same syntactic position. To see why this is so, compare the syntactic specifications of a neuter singular indefinite NP in (25) with the inflected adjective forms that constitute the output of the lexicon in (26).

(25) SYNTAX: [+ neuter]
[- plural]
[- definite]

(26) LEXICON:

a. *stort*	*b. stor*	*c. stora*
[+ neuter]	[- plural]	
[- plural]	[- definite]	
[- definite]		

(27) ett **stort** hus
a.nt.sg big.nt.sg house
'a big house'

No feature of any of the words in (26) expressly conflicts with the syntactic features in (25). Since each of the forms is compatible with the syntactic environment, a condition like NO CLASH is unable to winnow the field at all.

An alternative would be to require maximum agreement between syntactic specifications and inflected forms.

(28) The AGREE condition.

A syntactic terminal node and its associated inflected form have identical features.

The Agree condition would correctly select form (26a) from the lexicon for the environment specified in (25), since the sets of features associated with the syntactic structure and with that form are identical. The form in (26b) fares less well on this score because it has one fewer feature in common with the syntactic context. Note that (26c), *stora*, will always violate AGREE for any feature in the syntax, since the weak form has no features. This fact means that reliance on the AGREE condition alone would make incorrect predictions in other contexts, as we show below.

Compare the neuter singular definite context described in (29) to the paradigm in (30). Recall that only the weak adjective form (30c) surfaces in definite contexts, as shown in (31).

(29) SYNTAX: [+ neuter]
[- plural]
[+ definite]

(30) LEXICON:

a. *stort*	*b. stor*	*c. stora*
[+ neuter]	[- plural]	
[- plural]	[- definite]	
[- definite]		

(31) det **stora** hus-et

the.nt big house-the.nt

'the big house.'

In this context, (30a) has two features in common with the syntax and (30b) has one feature in common. Unfortunately, the form that actually surfaces in this environment, (30c), has no chance at all of satisfying AGREE, since the form has no features in common with the syntax. If we could rely only on AGREE, our grammar would incorrectly select the form in (30a) over (30c), since (30a) has more features in common. However, in (29-31), NO CLASH can rule out both (30a) and (30b). These forms run afoul of NO CLASH because they are each associated with a feature that is not present in the syntactic representation, namely [- definite]. Clearly, we need both conditions to account for the distribution of adjectives in Swedish NPs. (30c) is selected as the optimal form despite the fact that it violates AGREE twice (neither of the syntactic features are replicated in the morphology) because neither of the other forms is compatible with this environment.

2.8. NO CLASH, AGREE, and Optimality Theory.

In this section we want to point out that the two conditions on the morphology-syntax interface proposed here can easily be interpreted as Optimality theoretic constraints. The constraints are *ranked* with respect to each other, and AGREE, at least, is *violable*.

The constraints are ranked because NO CLASH has to take precedence over AGREE. We can see this by returning to the neuter singular definite environment given in (29-31), the forms (30a, b) have to be ruled out of consideration by NO CLASH because both strong forms still have more features in common with the syntax than the weak form in (30c) does, and therefore better satisfy AGREE. The only way that the unmarked weak form can surface is if the strong forms are ruled out by NO CLASH, before AGREE is invoked.

We also saw that an inflected form can violate AGREE and nonetheless surface as the optimal form in Swedish NPs. Remember, since the weak form lacks any features, it will violate AGREE for every feature in the syntactic representation. The only way the weak form can show up in singular environments is if both of the other forms violate the higher ranked NO CLASH.

The constraints NO CLASH and AGREE bear important similarities to faithfulness constraints proposed by McCarthy and Prince (1995). We discuss these similarities in more detail in section 5.5.

The fact that these constraints are ranked, and that at least one is violable suggests that an OT analysis of these data is appropriate. In the next section we show how the analysis can be couched in OT terms.

2.9. Swedish concord in OT.

In this section we show how these constraints can apply OT-style to account for the Swedish adjective alternation. We show that the two constraints defined above

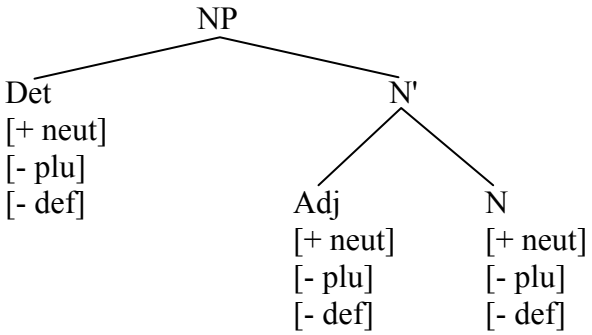
and their ranking combine to select the proper inflected form in all NP types. As we discussed above, NO CLASH has the effect of removing forms that are incompatible with the syntactic environment from the competition. The constraint called AGREE selects the form that most closely matches the syntactic environment from the inflected forms which survive NO CLASH. As we show below, these constraints have the important effect of ensuring the most faithful possible lexical expression of the morphosyntactic distinctions in syntactic representations.

Before delving into the details of the evaluation, we would like to take some time to discuss how the tableaux should be read. First of all, we are not evaluating morphological exponence with respect to the "INPUT" to the grammar. Instead, we are evaluating the associations between inflected forms and syntactic terminal nodes. We assume that the featural composition and linear order of the syntactic terminal nodes is regulated by higher ranked constraints than those we are considering in this thesis. We are only looking at a subset of the constraints needed to produce a grammatical NP. This means that we only need to focus on syntactically well formed phrases, and that all candidates are compared to the same structure.

By hypothesis, all of the syntactic terminal nodes in the same local NP will have the same morphosyntactic concord features, as discussed in chapter 1. The candidate set, then, consists of inflected forms in association with the terminal nodes of the syntactic structure. All members of a lexeme's paradigm compete for association with the targeted node. Thus, where an NP contains an adjective node, all three inflected forms (*stort, stor, stora*) compete to fill that node. The same holds of

nouns and specifiers: in an NP containing a specifier, all three forms of the specifier will appear in the candidate set (e.g. *det, den, de* 'the'). Thus, for a neuter singular indefinite NP, the syntactic representation will look something like that in (32). The candidate set will consist of various combination of inflected forms, as indicated by the partial candidate set in (33).

(32) *Syntactic Representation*



(33) *Candidate Set*

$Cand_1$	et [+ neut] [- plu] [- def]	stort [+ neut] [- plu] [- def]	hus [+ neut]
$Cand_2$	en [- plu] [- def]	stort [+ neut] [- plu] [- def]	hus [+ neut]
$Cand_3$	et [+ neut] [- plu] [- def]	stora	hus [+ neut]
$Cand_4$	et [+ neut] [- plu] [- def]	stor [- plu] [- def]	hus [+ neut]
$Cand_5$	…		

Since the features of all syntactic terminal nodes are identical, and all candidates are in association with the same syntactic structure, we only need to indicate the syntactic featural information once. We include this information in the cell in the tableau normally reserved for the input representation. Likewise, we are principally interested in accounting for the adjective alternation, therefore, we only include those candidates which differ with respect to adjective form. However, the same evaluation procedure that we discuss for adjectives also applies to other inflected forms in the NP. The results for adjectives generalize to the specifiers, so we can safely omit them from consideration. The same constraints that regulate adjective inflection regulate determiner and adjective inflection. There is no need to relativize the constraints to syntactic position. The constraints just check the relationship between a terminal node and the inflected form that occupies it.

In sum, we take the syntactic structure (and its associated features) to be given, and concentrate on evaluating associations in the candidates between terminal nodes and their associated inflected forms. Since all terminal nodes in the syntax have identical features, these are only represented once, in the cell normally reserved for the INPUT. The candidate set contains inflected forms in association with terminal nodes. Each member of inflected forms' paradigms (specifiers, adjectives, and nouns) appear in the candidate set. Finally, the constraints are not relativized to syntactic position. That is, NO CLASH and AGREE apply to the associations between terminal nodes and adjectives, determiners, and nouns.

We begin our look at the evaluation procedure with a neuter singular indefinite NP. The morphosyntactic features that describe a neuter singular indefinite NP, and which are common to all terminal nodes of a syntactic tree, are given in the input cell in (34). The relevant candidates appear in the cells below. For this set of features, we see that none of the inflected forms clashes with the syntactic context, therefore no candidate violates NO CLASH, and the choice of forms is left to AGREE. AGREE is violated for any discrepancy between features in the syntax and features in morphological representations. *Stor*, in (34b), is sub-optimal because it lacks a feature found in the syntax, namely [+ neuter]. The weak form of the adjective, *stora*, in (34c) violates AGREE for all features found in the syntax, as we discussed above. Since candidate (34a) agrees completely with the syntax, it is the winner.

(34)

	A, BIG, HOUSE [+ nt], [- plu], [- def]	NO CLASH	AGREE
☞a.	ett stort hus [+ nt] [- plu] [- def]		
b.	ett stor hus [- plu] [- def]		*! ([nt])
c.	ett stora hus [ ]		*!**
d.	...		

When a candidate inflected item is associated with a feature not found in the syntax, it violates NO CLASH; the effects of violating this constraint are shown in (35). Here the common singular indefinite syntactic structure lacks the gender feature associated with the lexical item in (35a). Both of the other candidates are associated

with subsets of the features found in the syntax, and therefore do not violate NO CLASH. The winner is (35b), since it has more features in common with the syntax than its remaining competitor, and so better satisfies AGREE.

(35)

	A, BIG, PIG [-nt], [-plu], [-def]	NO CLASH	AGREE
a.	ett stort hus [+ nt] [- plu] [- def]	*! ([nt])	
☞b.	ett stor hus [- plu] [- def]		
c.	ett stora hus [ ]		*!**
d.	...		

Now consider the indefinite neuter plural NP in (36). Here both candidates (36a) and (36b) run afoul of NO CLASH by virtue of the fact that they bear the feature [- plural], which is not instantiated in the syntactic structure. The weak form in (36c) wins the competition despite violating AGREE twice. This evaluation shows that NO CLASH crucially outranks AGREE, since if the constraint order were reversed, the winning candidate would be (36a). Similar results are found for all plural environments.

(36)

	NO, BIG, HOUSES [+ nt], [+plu], [- def]	NO CLASH	AGREE
a.	inga stort hus [+ nt] [- plu] [- def]	*! ([plu])	*
b.	inga stor hus [- plu] [- def]	*! ([plu])	**
☞c.	inga stora hus [ ]		***
d.	...		

Finally, let's consider the definite singular environment evaluated in (37). The result is similar to what happens in the plural, only the feature that causes the rejection of candidates (37a, b) in this case is the definiteness feature.

(37)

	THE, BIG, HOUSE [+ nt], [- plu], [+ def]	NO CLASH	AGREE
a.	det stort huset [+ nt] [- plu] [- def]	*! ([def])	*
b.	det stor huset [- plu] [- def]	*! ([def])	**
☞c.	det stora huset [ ]		***
d.	...		

Thus, we have shown that the morphosyntactic representations and constraints argued for above are capable of accounting for the full range of Swedish concord alternations.

2.10. The Elsewhere Condition and the morphology-syntax interface.

The function of the two constraints that we propose regulate the morphology-syntax interface, NO CLASH and AGREE, has important similarities with the well-known principle in linguistic theory called the *Elsewhere Condition*, or *Morphological Blocking*. We provide a general definition of the condition in (38).

(38) *The Elsewhere Condition.*

In a context where more than one rule can apply, the most specific rule applies, and the more general rule is blocked.

In Swedish, we interpreted this to mean that where more than one inflected form is compatible with a syntactic context, the grammar chooses the most specific compatible form (i.e. the inflected form with the most morphosyntactic features in common with the targeted syntactic terminal node).

The Elsewhere Condition was introduced into generative grammar by Kiparsky (1973) as a principled way to resolve rule conflict in phonology. As indicated in (38), where more than one phonological rule is compatible with a given structural description, the rule with the more specific domain applies, and the less specific rule is prevented, or blocked, from applying.

In the realm of morphology, the phenomenon described by the Elsewhere Condition is typically referred to as *Morphological Blocking* (Aronoff 1976, Andrews 1990, Ackermann 1990, Bochner 1992). Aronoff (1976) applied the condition in order to explain certain problematic facts in derivation. He sought to answer the

question of why some highly productive rules don't apply to some words. Aronoff's answer is that the application of the productive rule is blocked whenever a more specific rule can also apply. We illustrate the point with an example from inflectional morphology, but the phenomenon is the same in derivation.

Simplifying somewhat, we can say that the simple past tense in English is formed by a rule like the one in (39) which suffixes /*-ed*/ to the verb stem. However, there are a number of commonly occurring verbs that do not undergo this rule. The verb *go*, for instance, cannot undergo the rule in (39), despite the fact that the structural condition for the rule's application is met, *go* being a verb.

(39) <V, [PAST]> → V*ed*

(40) a. show ~ showed

b. go ~ went (*goed)

(41) <*go*, [PAST]> → *went*

If we posit a rule like (41), however, then the Elsewhere Condition lets us account for the alternations in (40a, b). Because the domain of application of the rule in (41) is narrower (it only applies to *go*) than the domain of application of the rule in (39) (it applies to verbs in general), the Elsewhere Condition dictates that (41) applies in lieu of (39), and the regularly formed **goed* is blocked.

The Elsewhere Condition was first applied to inflectional morphology by Andrews (1990), although in his application, morphological blocking has the character of an economy constraint on syntactic structures. Andrews looks at the Irish conditional verbal paradigm repeated in table 2.6 (Andrews 1990: 509) for the

equivalent of the English verb *put*. Subject information can be expressed in one of two ways in this paradigm, either synthetically, as a verbal suffix (as in the 1st person and 2nd person singular), or analytically, as a combination of an invariant form of the verb and a pronoun (or lexical NP).

Table 2.6. The Irish Conditional Paradigm.

	Singular	*plural*
1	**chuirfinn**	**chuirfimis**
2	**chuirfeá**	chuirfeadh sibh
3	chuirfeadh sé (M)/ sí (F)	chuirfeadh siad

Now, where synthetic verb forms can appear, it is ungrammatical to use an analytic construction, although the language has the resources to do this. Thus, the example in (42a) is the only possible way to express this sentence. The example in (42b), where a form not inflected for subject properties is paired with an overt subject pronoun, is unattested (Andrews 1990: 512).

(42) a. Chuirfinn isteach ar an phost sin
put.cond.1.sg in on the job that

b. *Chuirfeadh mé isteach ar an phost sin
put.cond. I in on the job that
'I would apply for that job'

Andrews accounts for the ungrammaticality of (42b) by appealing to the Elsewhere Condition. The synthetic verb form in (42a) is associated with more morphosyntactic information than the verb form in (42b) which doesn't encode any morphosyntactic person or number information about its subject. This use of the Elsewhere Condition isn't just a condition on the morphology-syntax interface, however, but also an

economy condition on syntactic structures, since Andrews formulates the blocking principle in such a way that whole structures have to be compared. A syntactic structure is to be discarded when the same functional information could have been gleaned from fewer words.

More recently, Stump (2001) argues that extrinsic ordering of word-formation rules within morphological rule blocks can be avoided entirely in a range of situations by appealing to the Elsewhere Condition, which he calls *Pānini's principle*.[8] Stump presents data from a wide range of languages and phenomena to show that, in most cases, Pānini's principle obviates the need for stipulating the order of application of word-formation rules. Given a set of morphosyntactic features, Pānini's principle selects the most specific, compatible word-formation rule to apply to a stem.

Let's take a closer look at the Elsewhere Condition as originally formulated and see how it is similar in effect to our two constraints on the syntax-morphology interface. Kiparsky's Elsewhere Condition is presented in (43) (1973: 94).

(43) Two adjacent rules of the form

$A \rightarrow B / P \_\_ Q$

$C \rightarrow D / R \_\_ S$

are disjunctively ordered if and only if

(a) the set of strings that fit PAQ is a subset of the strings that fit RCS, and

(b) the structural changes of the two rules are either identical or incompatible.

We can see that the members of the Swedish adjective paradigms stand in the relationship described in (43). So, the features expressed by (44b) are a subset of the

[8] Kiparsky (1973) also attributed the Elsewhere Condition to Pānini.

features expressed by (44a), and the form (44c), in turn, expresses a subset (though trivial) of the features expressed by (44a) and (44b). In other words, the morphosyntactic description of both (44b) and (44c) are subsumed by the morphosyntactic description of (44a). Furthermore, the phonological shapes of the inflected forms are clearly distinct (as stipulated in (43b)).

(44) a. *stort* b. *stor* c. *stora*

[+ neuter] [- plural]

[- plural] [- definite]

[- definite]

In all cases, the Elsewhere Condition consists of three requirements. First, specifications of competing rules or lexical entries must be compatible with the targeted semantic or morphosyntactic context. Second, the competing forms must stand in a superset-subset relation. And third, the most specific, most informative, or narrowest rule or lexical entry must be selected from among those compatible.

The effects of the two constraints that we have adopted in this chapter, along with their ranking, are equivalent to the workings of the Elsewhere Condition with respect to inflectional morphology in Swedish. The higher-ranked constraint, NO CLASH, removes incompatible inflected forms from the competition. The lower-ranked constraint, AGREE, causes the most specific remaining form to be selected. As we showed above, this interaction makes underspecification of morphosyntactic features possible.

However, the conception of the Morphological Blocking proposed here (NO CLASH >> AGREE) has two important properties that distinguish it from previous formulations. One important difference is that, although Swedish forms are so arranged, the more general conception of morphological blocking that we are advocating does not include the stipulation that morphosyntactic property sets associated with competing inflected forms stand in a superset-subset relation to each other.[9] This means that the version of Morphological Blocking that we apply to the syntax-morphology interface can apply to a wider range of contexts than earlier approaches. In the following chapters we show that this property of the interface, in part, allows us to account for certain data in Icelandic and German to which the Elsewhere Condition proper can not be applied. We show that in both of these languages it is possible that, as a consequence of underspecification, competing suffixes may have disjunctive sets of morphosyntactic features and nonetheless be compatible with the same syntactic context.

The second important difference between this approach and the Elsewhere condition is that we do not conceive of the Morphological Blocking as a unitary phenomenon. That is, the two components of the Elsewhere Condition are separated into independent constraints. This is important, because it suggests that other constraints should be able to intervene between NO CLASH and AGREE. As a result, the two components of the Elsewhere Condition can be broken up by other grammatical constraints, masking its effects

[9] Though if NO CLASH is undominated, as appears to be the case in the languages under investigation, the winning form(s) will always express a subset of the features associated with the syntactic terminal node.

In the remainder of this thesis, we look at a number of examples where The Elsewhere Condition/Morphological Blocking does not appear to apply. We show that in all cases a principled override of Morphological Blocking is involved, and can be modeled in terms of some other constraint or constraints ranked between NO CLASH and AGREE. We adopt the term NCA Blocking (NO CLASH/AGREE effects) effects to describe the blocking relationships allowed by our approach. As noted above, NCA Blocking differs from the relationship described by the Elsewhere Condition insofar as we do not require that forms competing for association with some terminal node stand in a subsumption relationship.

(45) *NCA Blocking Convention*

NO CLASH >> AGREE

2.11. Conclusion.

In this chapter we discussed patterns of inflection in Swedish NPs with an eye towards identifying the necessary components of the morphology-syntax interface. We showed that underspecification of morphosyntactic features associated with inflected forms is preferable to full specification on the grounds of economy and the ability to capture generalizations over paradigms. However, the former approach requires a slightly more complex version of the morphology-syntax interface. We adopted two constraints on the faithful expression of morphosyntactic features associated with syntactic representations, called NO CLASH and AGREE, and showed how they have an Optimality Theoretic interpretation. These two constraints work

like the well-known Elsewhere Condition when competing forms stand in a superset-subset relation. The fact that we do not require such a relation means that our version of morphological blocking differs from the Elsewhere Condition, however. We termed the blocking effects countenanced by our approach *NCA Blocking*. In the next chapter we show how this approach can be extended to account for the more complex inflectional patterns of Icelandic, where the Blocking Convention seem to be subverted in certain contexts.

Chapter 3

Phrasal Concord in Icelandic

3.1. Introduction.

In the previous chapter we argued on the basis of Swedish adjective inflection for underspecification of morphosyntactic representations. We also showed how morphological blocking effects could be reproduced by means of two ranked constraints governing the faithful morphological expression of syntactic features. In this chapter we apply this same approach to an account of the intricate patterns of inflection in the Icelandic NP.

Adjectives in Icelandic can be inflected according to one of two paradigms, called the strong and the weak paradigms. We show that most weak suffixes are less morphosyntactically specific than their strong counterparts. That is, the suffixes that constitute the weak paradigm encode, by and large, fewer morphosyntactic features than the corresponding strong suffixes.

The problem that Icelandic poses for any approach to the morphology-syntax interface is that the less specific weak suffixes regularly surface in place of, and alongside of, more specific strong suffixes. In other words, less specific suffixes appear to block more specific, compatible suffixes in violation of the NCA Blocking Convention. Furthermore, because the set of morphosyntactic feature set expressed by the less specific form does not necessarily constitute a subset of the morphosyntactic feature set expressed by the more specific blocked form, the conditons for the

application of the Elsewhere Condition (or its morphological counterparts) do not obtain. Thus, neiter the Elsewhere Condition, nor the NCA Blocking Convention alone can account fro the Icelandic data.

In this chapter we argue that weak suffixes are indeed less specific than strong ones, and that Icelandic requires that we allow the model of the syntax-morphology interface outlined in the previous chapter to be augmented. We show that a principled override of the Blocking Convention is possible due to morphosyntactic properties of weak suffixes. Specifically, weak suffixes will be shown to bear a feature not associated with strong suffixes. Weak suffixes can, therefore, surface in Icelandic NPs just in case their presence means that more, distinct morphosyntactic features are expressed across the whole NP than would otherwise be the case.

This chapter is organized as follows. First, we show that weak suffixes encode less morphosyntactic content than strong suffixes do. Next we discuss the patterns of inflection in the Icelandic NP, and provide the relevant generalizations concerning the distribution of the different suffix types (strong vs. weak) in Icelandic NPs. We argue that weak suffixes encode the property of *definiteness*, but that strong suffixes are neutral with respect to this category. This fact lies at the heart of why weak suffixes can surface in apparent contravention of the Blocking Convention: in some contexts the combination of different suffix types in an NP expresses more morphosyntactic information than would be possible if all modifiers were inflected with the same suffix type. In order to see how this works, it is necessary to discuss the identity and distribution of morphosyntactic concord features in the Icelandic paradigms in detail.

Armed with the appropriate generalizations about what properties each suffix encodes, we show why and how the Blocking Convention needs to be overridden in order to account for the Icelandic data, and discuss certain implications of this proposal.

3.2. Weak suffixes are less specific than strong suffixes.

Attributive adjective suffixes in Icelandic may be drawn from one of two paradigms, traditionally called the *strong* and *weak* paradigms. The two paradigms are given in table 3.1. We discuss in a subsequent section the factors that force the choice of one suffix type or another, at this point we just want to compare the information content of the different paradigms. The strong paradigm contains 15 inflected forms. The weak paradigm, in contrast, contains only four (if we count the /-u/ suffix twice, once in the feminine singular and once in the plural; otherwise, the paradigm has only three suffixes).

Table 3.1: Icelandic Adjective Paradigm: *gulur* 'yellow'

<table>
<tr><td></td><td colspan="3">STRONG ADJECTIVE PARADIGM</td><td colspan="3">WEAK ADJECTIVE PARADIGM</td></tr>
<tr><td>singular</td><td>MASCULINE</td><td>NEUTER</td><td>FEMININE</td><td>MASCULINE</td><td>NEUTER</td><td>FEMININE</td></tr>
<tr><td>NOM</td><td>gul-ur</td><td rowspan="2">gul-t</td><td>gul</td><td>gul-i</td><td rowspan="4" colspan="2">gul-a</td></tr>
<tr><td>ACC</td><td>gul-an</td><td>gul-a</td><td rowspan="3">gul-u</td></tr>
<tr><td>GEN</td><td colspan="2">gul-s</td><td>gul-rar</td></tr>
<tr><td>DAT</td><td>gul-um</td><td>gul-u</td><td>gul-ri</td></tr>
<tr><td>plural</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>NOM</td><td>gul-ir</td><td rowspan="2">gul</td><td rowspan="2">gul-ar</td><td rowspan="4" colspan="3">gul-u</td></tr>
<tr><td>ACC</td><td>gul-a</td></tr>
<tr><td>GEN</td><td colspan="3">gul-ra</td></tr>
<tr><td>DAT</td><td colspan="3">gul-um</td></tr>
</table>

We claim that the weak suffixes are generally less specific than their strong counterparts. One suffix is less specific than another if it encodes fewer morphosyntactic properties. In the present context, then, a more specific form is one

that has more morphosyntactic features. The relevant properties for these paradigms include features for gender, case, and number. We argue in later sections that definiteness is also relevant. We can see that the weak paradigm is less specific in a couple of ways.

Consider first just the plural portions of the paradigms. The weak plural suffix /-u/ expresses neither gender nor case properties of the containing NP. That is, it is compatible with any gender or case. This form cannot be associated with gender or case features, since assigning this suffix any gender or case features would incorrectly make it incompatible with some plural contexts in which the suffix appears. The strong paradigm, on the other hand, encodes all three gender distinctions, and all four case distinctions. Holding number constant, then, the strong paradigm expresses numerous case and gender distinctions not present in the weak paradigm.

Another way of looking at the issue is that the same paradigmatic space that is filled by a single plural suffix in the weak paradigm is filled by six different plural forms in the strong paradigm. Any suffix in the strong paradigm provides more information about case or gender (or both) than almost any suffix in the weak paradigm. This holds true of the singular halves of the paradigm as well. For instance, the feminine non-nominative weak suffix /-u/ corresponds to three distinct strong suffixes. Similarly, the weak /-a/ suffix corresponds to six distinct forms in the strong paradigm.

We can also illustrate this issue by comparing individual cells. For example, in addition to expressing plurality, the masculine nominative plural /-ir/ has to express

masculine gender, since it contrasts with distinct neuter and feminine forms; and it has to express case, since it contrasts with distinct accusative and oblique forms. The weak plural /-u/ suffix does not preserve either contrast. The /-ir/ suffix is specific to a single cell in the paradigm, the plural /-u/ suffix is common to 12 cells.

Thus, weak suffixes express fewer morphosyntactic distinctions than strong suffixes, and are therefore less specific. This fact is not, in itself, problematic. However, as we show in subsequent sections, weak suffixes appear in environments with which strong suffixes are also compatible, escaping NCA Blocking effects.

3.3. Distribution of the strong and weak suffixes in Icelandic NPs.

Recall from previous discussion that NCA Blocking selects the most specific from among suffixes compatible with a given environment. If weak suffixes are less specific than strong suffixes, then weak suffixes should not surface in any environment where a strong suffix is also compatible. To show that this does, in fact, happen in Icelandic, we need to discuss the distribution of suffix types (strong and weak). In this section we show the basic generalizations about the distribution of strong and weak inflection in Icelandic NPs. We will show that strong suffixes occur in both definite and indefinite contexts, but that weak suffixes occur only in definite NPs. Furthermore, we point out that despite the variety of NP word orders in Icelandic, inflection type is independent of word order.[1]

---

1 The order of elements in Icelandic NPs presents interesting syntactic puzzles, see Sigurðsson (1993), or Marit (2002) for detailed discussion, and Studia Linguistica (1993(2)) for a number of articles exploring Scandinavian syntax. See also Börjars and Donohue (2000) and Hankamer and Mikkelsen (2002) for a recent discussion of Danish DPs. Our concern, however, lies with morphological

In Icelandic there are two types of modifiers that inflect for gender/case/number: Specifiers (including the definite determiner, possessive adjectives, demonstratives, and various quantifiers) and attributive adjectives. Specifiers are always inflected according to the strong paradigm. Attributive adjectives may be either strong or weak, depending on contextual factors that we discuss below.

3.3.1. Modifiers are strongly inflected in indefinite NPs.

Icelandic has no indefinite article. Bare noun phrases may be interpreted as indefinite. In NPs with indefinite interpretation which are headed by common nouns and lack lexical specifiers, attributive adjectives will always have strong inflection.

(1) gul-**t** blóm
yellow-nt.sg flower
'a yellow flower.'

3.3.2. Attributive adjectives are weak in definite NPs.

In definite NPs in Icelandic, attributive adjectives are inflected according to the weak paradigm. Strong suffixes occur only on specifiers and (where possible) nouns.[2] The definite article may appear as a suffix on the head noun, or as a pre-nominal free morpheme. In (2a) the definite article occurs as a suffix on the noun. In (2b) the

---

exponence, so the purpose of this section is to familiarize the reader with those aspects of the Icelandic NP rather than address NP syntax in detail.

[2] The noun paradgim is similar in many respects to the strong paradigm. Where the two differ, the noun is typically uninflected. Only in two cells is there a noun suffix which is distinct from the strong suffix.

definite article occurs initially as a free morpheme. The phrases in (2) are equivalent in meaning; however, NPs with free standing articles are stylistically marked, occurring mostly in written language (Pétursson, 1978). Note that *both* the noun *and* the definite article are inflected for gender/case/number regardless of whether the article is free-standing or suffixed. In examples throughout the chapter, strong suffixes are in boldface, weak suffixes in italics.

(2) a. goð-*i* hest-**ur**-in-**n**

good-def horse-masc.nom.sg-the-masc.nom.sg

b. hin-**n** goð-*i* hest-**ur**

the- masc.nom.sg. good-def horse-masc.nom.sg

'the good horse.'

3.3.3. Weak suffixes violate the Blocking Condition.

The observations in the previous sections lead to the following three generalizations about the distribution of strong and weak inflection in Icelandic:

Generalization 1: Specifiers are always strong.

Generalization 2: Attributive adjectives are strong in indefinite NPs.

Generalization 3: Attributive adjectives are weak in definite NPs.

We learned that strong suffixes are compatible with both definite and indefinite environments: Strong suffixes appear on all modifiers in indefinite NPs, and they appear on specifiers in definite NPs. Attributive adjectives in definite NPs, however, are always inflected according to the weak paradigm. The fact that strong and weak

suffixes occur in the same NP shows that strong suffixes are compatible with the environments in which weak suffixes appear. However, if weak suffixes are indeed less specific than strong suffixes, the Blocking Convention predicts that weak suffixes should be suppressed in favor of more specific strong suffixes wherever a compatible strong suffix is available. Example (2) showed that weak suffixes aren't blocked.

We discuss the morphosyntactic properties of the suffixes and paradigms in detail in a later section. First, however, we want to look more closely at the distribution of strong and weak suffixes in order to show that weak suffixes express the morphosyntactic property of *definiteness*, while strong suffixes are neutral with respect to this category.

3.4. Weak suffixes express the category of *definiteness.*

In this section we show explicitly that the morphosyntactic category of definiteness is relevant to inflection in the Icelandic NP, and that the property is signaled by weak suffixes, but not by strong suffixes. First, we show that Icelandic NPs show concord for definiteness. Next we show that weak suffixes are barred from occurring in indefinite NPs. Taken in conjunction with the generalization expressed above that strong adjectives occur in either type of NP, these observations strongly suggest that weak suffixes in Icelandic are [+definite], but strong suffixes are unspecified for this feature.

3.4.1. Concord for definiteness.

The contexts in which the weak~strong alternation take place in Icelandic are nearly identical to those that we observed in Swedish,[3] and arguments for including definiteness as a concord feature are the same.

3.4.1.1. Indefinite NPs.

We saw above that Icelandic has no indefinite article, but NPs with no specifier can be interpreted as indefinite, in which case the adjective is strongly inflected.[4] In other indefinite NPs, both adjective and specifier are strongly inflected. Indefinite quantifiers, like most other specifiers, appear leftmost in the NP, as in (3). As in Swedish, there is a class of quantifiers that can be considered *indefinite*. These occur with strongly inflected adjectives. This example contains *nokkur* 'some'. Other quantifiers that co-occur with strongly inflected adjectives include *allur* 'all', *flestur* 'most', *margur* 'many', *fár* 'few', *ekki* 'no', and *summur* 'some'.

(3) **nokkur-t** gul-**t** blóm
some-neut.sg yellow-nt.sg flower
'some yellow flower.'

[3] They are also nearly identical to the contexts which trigger a similar alternation in Faroese (Lockwood, 1964).
[4] Plural NPs lacking specifiers can also be interpreted as generic. We discuss bare NPs with definite reference in section 4.1.2 below.

3.4.1.2. Definite NPs.

In section 3.2. we saw that adjectives are weakly inflected when they occur with the definite article. There are a number of other contexts that require a weakly inflected adjective. Weak suffixes also surface when the NP specifier is a possessive adjective, as in (4). Note that both limiting adjectives (the definite article suffix, and the possessive adjective) are strongly inflected, and that both occur postnominally.

(4) gul-*a* blóm-**ið** **mitt**

yellow-def flower-the.nt.sg 1.poss.nt.sg

'my yellow flower.'

In addition to possessive NPs and NPs containing the definite article, there are a number of other contexts in which weak adjectives show up; we list them briefly here.

Attributive adjectives are weakly inflected when there is a genitive NP in the specifier position:

(5) nýj-*a* bók höfund-**ar**

new-def book.nt author-fem.gen.sg

‘the new book of an author’

Attributive adjectives are weakly inflected when with proper names and in direct address, as in (6-7).

(6) góð-*i* Ólafur

good-def Ólafur

‘(my) good Ólafur’

(7) kær-*i* vin-**ur**

good-def friend-masc.nom.sg

‘(my) good friend’

Attributive adjectives are also weakly inflected when with demonstratives:

(8) sá góð-*i* hest-**ur**

that.masc.nom.sg good-def horse-masc.nom.sg

‘that good horse’

As we argued in chapter 2, the contexts in (4-8) constitute *definite* environments.

3.4.1.3. Summary.

As in Swedish, it is relatively easy to list the types of NPs in which strong or weak adjectives occur. Like Swedish, it appears to be the case that weak adjectives occur in definite NPs, but that indefinite NPs require that an attributive adjective be strongly inflected. The contexts in which each adjective type occurs are listed in table 3.2.

Table 3.2: Distribution of strong and weak adjectives in Icelandic.

Weak adjectives occur:	Strong adjectives occur:
• in NPs containing definite article. • in NPs containing demonstratives. • in NPs containing possessive adjectives. • as attributes of proper names. • in direct address. • when there is a genitive NP in specifier position.	• when the noun is modified only by attributive adjectives and has an indefinite interpretation (indefinites, generics). • after indefinite quantifiers *allur* 'all', *flestur* 'most', *margur* 'many', *fár* 'few', *inter alia*. • predicate position.

3.4.2. Weak suffixes are barred from appearing in indefinite contexts.

We have seen that weak suffixes only occur in definite NPs. However, given that we are assuming violable constraints and morphosyntactic underspecification, this fact does not necessarily mean that weak suffixes are specified for definiteness. It is also possible that they are compatible with indefinite contexts but do not surface in those contexts because the strong suffixes express a greater number of relevant morphosyntactic features. However, there is a pattern in the paradigms that suggests that weak suffixes are, in fact, incompatible with indefinite NPs.

There are two adjective forms that are compatible with feminine nominative singular environments. The strong adjective form is unsuffixed, and only occurs in indefinite NPs, as shown in (9). A weak adjective suffix also occurs in feminine nominative singular, but only in definite environments, as shown in (10).

(9) a. gul skál *fem. nom. sg. indef.*
yellow shell

b. *gul-*a* skál
yellow-def shell
'a yellow shell'

(10) a. gul-*a* skál-in *fem. nom. sg. def.*
yellow-def shell-the

b. *gul skál-in
yellow shell-the
'the yellow shell'

The examples in (9) & (10) are both feminine nominative singular NPs. The only morphosyntactic difference between the two phrases is definiteness. Now, it is possible to analyze the unsuffixed forms in the strong paradigm as being unspecified for any relevant morphosyntactic features (see section 7 below). That is, the lack of a suffix in this instance may also indicate a lack of concord features.[5] If this is so, then we have to explain why the suffixed form (*gula*) is barred from appearing in indefinite environments (as shown in (10b)). That is, if the form *gul* has no concord features, it also can not block *gula* from surfacing in feminine nominative singular environments. Therefore, it must be some property of *gula* that restricts its occurrence to definite environments. Assigning *gula* the attribute [+definite] would easily explain these facts. The feature [+definite] prevents *gula* from surfacing in indefinite contexts. At the same time, *gula* is more specific (by virtue of having one more feature) than *gul*. The weak form *gula* would block *gul* in feminine nominative singular definite contexts. Thus, if unaffixed forms in this paradigm are also unassociated with concord features, this pattern can be taken as evidence that weak suffixes are [+definite].

3.4.3. Summary: weak adjectives are specified for definiteness.

In this section we showed that attributive adjectives are sensitive to whether the containing NP is definite or indefinite. The list of definite versus indefinite quantifiers and NP types is nearly identical in Swedish and Icelandic, suggesting that

[5] This is not a necessary assumption, of course. We argued in the last chapter that the unsuffixed form *stor* was associated with morphosytnactic features, while the suffixed form *stora* was morphosyntactically unmarked. However, there is no evidence in Icelandic that these unsuffixed forms must have morphosyntactic features.

there is a concord feature for definiteness. In section 3 we noted that strong suffixes can appear in either definite or indefinite environments, and so must be unspecified for this dimension of the paradigm. While this suggested that weak suffixes were marked for definiteness, it was not conclusive, since the Blocking Condition could suppress weak suffixes in indefinite contexts if competing strong suffixes are more specific. We then looked at an environment in which a weak suffix is suppressed in favor of an unsuffixed adjective. If the lack of a suffix is equivalent in this paradigm to a lack of morphosyntactic concord features, then this fact is most easily explained if the weak adjective is incompatible with the environments in which the bare form of the adjective surfaces. The only property that could make the /-a/ suffix incompatible with the context was *definiteness*, since the /-a/ form can surface in definite feminine nominative singular environments, as shown in (10). Hence, we conclude that weak suffixes, whatever other properties they bear, must also be specified as *definite*.

3.5. Weak suffixes contribute to concord.

In previous sections we showed that suffixes in the weak paradigm are, generally speaking, less specific than their strong counterparts. This is a problem because a model of concord based on the the Blocking Convention predicts that less-specific suffixes should be suppressed in favor of more specific suffixes. Hence, the proposal we developed in the last chapter predicts that weak suffixes should never occur in Icelandic. Furthermore, these alternations can not be accounted for by

appealing to the Elsewhere Condition, since the weak suffixes do not express a subset of the features expressed by the strong suffixes.

We also looked at the distribution of strong and weak suffixes in NPs and concluded that since strong suffixes occur both in definite NPs (on specifiers) and in indefinite NPs (on specifiers and adjectives), they must be compatible with both definite and indefinite contexts. On the other hand, we saw that weak suffixes only occur in definite NPs. We argued that weak suffixes are blocked from occurring in indefinite NPs because they are [+definite], and therefore conflict with the [-definite] property of the containing NP.

Given that weak suffixes are less specific than strong suffixes in nearly every context, we must ask why weak suffixes occur at all in Icelandic? We suggest that weak suffixes are permitted in definite NPs because they contribute a feature towards the satisfaction of concord that cannot be contributed by other sub-constituents in the phrase: definiteness. We'll call this the *Secondary Concord Hypothesis.*

(11) *The Secondary Concord Hypothesis.*

> A less specific suffix may surface in an NP, despite the existence of more specific compatible forms, if the less specific suffix is an exponent of a feature not instantiated elsewhere in the NP, and the more specific suffix is not.

The Secondary Concord Hypothesis is incompatible with the Blocking Convention. In a subsequent section we will propose a constraint that allows one part of the Blocking Convention to be overridden in order to maximize the morphological

expression of morphosyntactic features across the whole NP. As we will see, this constraint can only be satisfied at the expense of achieving maximum specificity on every node in the NP (i.e., by violating AGREE). In other words, we propose that a less specific suffix can beat out a more specific suffix if the less specific suffix contributes morphosyntactic information that can't be obtained from other words in the phrase.

Before we can show how this proposal works, however, we need to discuss the distribution of morphosyntactic features in each of the relevant paradigms. The distribution of features will have important consequences for how our proposal works.

3.6. Features in the Icelandic NP.

In this section we discuss what features are necessary to describe the Icelandic paradigms, and how these features are distributed in the paradigm. In a subsequent section we will propose a constraint that will allow us to capture the Secondary Concord Hypothesis. However, before we can demonstrate this aspect of the proposal, we need to know in detail how concord features are distributed in the Icelandic paradigms. Since the strong paradigm is large and rather intricate, we will concentrate just on the plural half of the paradigm. We can make all of the relevant points by looking only at this subset of forms. The full set of feature specifications for all paradigms can be found in Appendix 1. Since the weak paradigm is considerably smaller and simpler than the strong paradigm we will show all of the suffixes for that paradigm. Also, the noun paradigm is identical to the strong adjective paradigm in the plural. We don't, therefore, discuss the noun paradigm in detail.

Before we delve into the morphosyntactic details of the Icelandic concord paradigms, let's take a moment to review what we know about them. We saw that attributive adjectives in Icelandic can be inflected according to either the strong or the weak paradigm, depending on syntactic context. Attributive adjectives in indefinite NPs are strong, while attributive adjectives in definite NPs are weak. The strong paradigm also applies to specifiers, but the weak paradigm does not. This means that specifiers are always strongly inflected, regardless of whether the NP is definite. Both definite and indefinite specifiers take strong inflection. Thus, strong inflection surfaces both in definite NPs (on specifiers) and in indefinite NPs (on specifiers and attributive adjectives), and weak suffixes only surface in definite NPs (on attributive adjectives). We argued that these facts indicate that strong suffixes have no value for the definiteness feature, and that weak suffixes must therefore be [+definite].

The main problem that these facts pose for the morphology-syntax interface is that specifying weak suffixes as [+definite] is not sufficient to ensure that they surface in the appropriate contexts. Because strong suffixes are still more specific than weak suffixes with respect to other concord features, weak suffixes should be prevented from surfacing by the Blocking Convention. The fact that weak suffixes are specified for definiteness while strong suffixes are not means that the Elsewhere Condition, as traditionally formulated, can not adjudicate between competing forms. At the same time, the fact that weak suffixes allow additional information to be expressed led us to propose the Secondary Concord Hypothesis. The hypothesis states that a less specific form can surface if it has a feature that other more specific suffixes in the NP don't.

Before we can talk about which suffixes have which features, we need to know what features are relevant for Icelandic NPs, and how the features are distributed in the strong paradigm, and then the weak paradigm. To that end, we will first lay out the morphosyntactic features that we propose are appropriate for describing the paradigms. We will justify this choice of features partly in this sub-section, and partly in the following sub-sections, as we discuss the data that provides evidence for the feature in question. After laying out the needed features, we will discuss in detail their distribution across the paradigms. Since we are not assuming full specification of inflected forms, but relying on contrastive specification of morphosyntactic features to account for syncretism, and due to the richness of the paradigms in question, this is not a trivial task. Furthermore, the precise distribution of features across all three paradigms ultimately plays a crucial role in our analysis of the broader (phrasal) patterns of inflection discussed in the previous section. Once we have elucidated the structures of the paradigms, we will show how the patterns of inflection can be accounted for within an association model of the morphology-syntax interface.

Within the context of the Icelandic NP there are four categories of features that we need to be concerned with: features for number, features for gender, features for case, and features for definiteness. Features for gender and definiteness should be relatively uncontroversial. Since there is only one number distinction, a single feature is necessary: [+/- plural].

(12)

	singular	plural
[plural]	-	+

The definiteness status of an NP can also be captured by a single feature. We'll call the feature [+/-definite]. Definite NPs are [+definite], indefinite NPs are [-definite].

(13)

	indefinite	definite
[definite]	-	+

There are three genders in Icelandic: masculine, neuter, and feminine. Therefore, we need two features to describe gender distinctions, we call these [+/-masculine] and [+/- feminine]. These features are distributed according to the table in (14). A positive value for both features is undefined in Icelandic.

(14)

	masculine	neuter	feminine
[masculine]	+	-	-
[feminine]	-	-	+

The features we posit for case are slightly more elaborate. Although the four case system of Icelandic could be described by only two features, we will posit three. The most obvious distinction to be made is in terms of direct cases (nominative and accusative) vs. the oblique cases (genitive and dative), hence we posit a primary feature [+/-oblique]. Within the division created by the feature [oblique] we now need to separate nominative from accusative on the one hand, and genitive from dative on the other. Ideally, we could use the same feature to distinguish the cases within the oblique/non-oblique split.[6] While it is tempting to use a single feature for this job, it is convenient to be able to refer to the nominative case in isolation (without

[6] Bierwisch (1967) proposed a feature [+/- governed] for German which acknowledges the similarity between nominative and genitive case: both occur in specifier position of some syntactic structure, and both can occur in ungoverned positions. The analysis is adopted by most researchers to come after him (Zwicky 1986, Blevins 1998, Kathol 1999, Hughes 2000).

concomitantly picking out genitive). Thus, we propose two secondary features: [+/-nominative] and [+/-genitive]. Nominative case is characterized by having a negative value for the feature [oblique], and a positive value for [nominative]. Genitive case, on the other hand, will have a positive value for both [oblique] and [genitive]. We assume that a positive value for [oblique] implies a negative value for [nominative]; likewise, a negative value for [oblique] implies a negative value for [genitive]. The utility of this arrangement will become more apparent when we take a closer look at the paradigms in the next section. Cases in Icelandic can be defined, then, according to the matrix in (15).

(15)

	nominative	accusative	genitive	dative
[oblique]	-	-	+	+
[nominative]	+	-	(-)	(-)
[genitive]	(-)	(-)	+	-

In the next section we examine the relevant portions of the important paradigms (the strong adjective paradigm and weak adjective paradigm[7]) in detail, with the aim of determining the proper distribution of the features discussed in this section across the paradigms. The precise distribution of features in the paradigms is important to how our analysis accounts for the data; therefore, it is important that we examine these paradigms carefully.

[7] The noun paradigm and strong adjective paradigm are morphosyntactically identical in the plural, so we don't have to consider the noun paradigm separately. The full noun-paradigm and its associated morphosyntactic features can be found in appendix 1.

3.7. Assigning features to desinences.

When assigning features to desinences, we follow the guidelines in (16):

(16) a. Assign features to preserve morphosyntactic contrasts between forms.

b. Where two forms are compatible with the same environment, one form has to be more specific.

Both guidelines in (16) follow from the NCA Blocking Convention. (16a) is a consequence of ranking NO CLASH above AGREE. This guideline helps keep the feature system as simple and streamlined as possible. Assigning a feature to a form can have two paradigmatic effects. A feature can serve to keep a desinence from surfacing in some context ([-oblique] prevents a suffix from surfacing in genitive or dative case). Or, where two suffixes are compatible with the same environment, a feature can prevent some other suffix from surfacing by making one desinence more specific than another.

The second guideline in (16) also reflects a property of the Blocking Convention (specifically AGREE). If two suffixes are compatible with the same environment, then one *must* be more specific than another, or the grammar will have no way to choose one form over the other (*caveat* later discussion).

In sum, as a methodological principle, we want to assign each desinence as few features as possible. Each feature should, therefore, serve a purpose. Assigning a feature to a desinence will make that desinence incompatible with certain syntactic environments (by forcing a violation of NO CLASH). At the same time, the feature may make the desinence more specific than some other compatible form (enabling the form

to better satisfy AGREE). Careful specification of features allows us to describe the environments in which desinences can surface.

In the next sub-sections we put the feature system described in the previous section to use, following the guidelines just discussed. Again, we are only going to discuss the plural half of the strong paradigm since we can make all of the relevant points with this data. Discussing the entire paradigm in appropriate detail would only distract from the main issues. After looking at the strong plural paradigm, we will examine the weak paradigm. Since the weak paradigm is considerably less complex, containing only four desinences, we can easily discuss the entire paradigm.

3.7.1. Features in the strong paradigm.

The plural half of the strong paradigm is reproduced in table 3.3. We include the morphosyntactic feature assignments that we claim each suffix expresses. These features are assigned in accordance with the guidelines discussed above. Note that none of the suffixes is specified for the full range of morphosyntactic features. Second, there is considerable syncretism in the paradigm, which is captured neatly by underspecification.

Table 3.3. The Plural Strong Paradigm.

plural	MASCULINE	NEUTER	FEMININE
NOM	gul-ir [+masculine] [-oblique] [+nominative] [+plural]	gul [ ]	gul-ar [+feminine] [-oblique] [+plural]
ACC	gul-a [+masculine] [-oblique] [+plural]		
GEN	gul-ra [+oblique] [+genitive]		
DAT	gul-um [+oblique]		

Our general approach in discussing the feature specifications of the suffixes in this paradigm is to move from the less specific to the more specific. Let's begin by looking at the neuter non-oblique cells. Here the adjective is unaffixed. It is possible to leave this form completely unspecified for morphosyntactic concord features.[8] Leaving this form unspecified has two consequences. First, if the form has no features, it never clashes with any syntactic environment (i.e. it is compatible with any environment). Second, since it is less specific than all other desinences, in order to preserve the contrast between this form and the rest of the paradigm no other suffix can be compatible with the environments in which *gul* surfaces.

If the neuter non-oblique form is maximally general, then all potential competitor suffixes have to be made featurally incompatible with the environment in

[8] This is not a necessary move. We could easily assign some combination of features to the bare stem that occupies the cells in question. There are at least three reasons not to do so. First, as we discuss below, it is not necessary. Second, this analysis is simpler than one which posits features here. We need one fewer rule. Third, this approach lets us use the same morphological analysis for these cells and the unaffixed form in the feminine nominative singular, as discussed above.

which it surfaces. In other words, all competing cells in the paradigm have to be specified for gender or case (or, for singular desinences, number). So, while this form has no features, it has important effects on other members of the paradigm.

Now let's look at the oblique plural cells. Both the genitive and dative suffixes can surface in any gender. This fact means that we can't assign any gender features here. Assigning these suffixes a gender feature would make them incompatible with some environment in which they surface. Since they aren't specified for gender, they have to be specified for case to keep them from surfacing in neuter non-oblique plural environments (where the bare form surfaces). Therefore, we assign both suffixes the feature [+oblique]. One of these suffixes has to be specified for the secondary case feature too, so that there is a contrast between the two oblique forms. We assign the feature [+genitive], somewhat arbitrarily, to the suffix /-ra/ (either suffix could bear the feature, only one *must* have it). Neither of these cells has to be marked as plural, however, because competing singular cells are [-plural].[9]

Now let's turn our attention to the remaining non-oblique plural cells. As noted above, all of these cells have to be specified for gender, since they are in competition with the unmarked neuter form in the same case environments (nominative and accusative). The feminine non-oblique plural /-ar/ is also in competition with the aforementioned unaffixed (and morphosyntactically unmarked) feminine nominative singular. This means that /-ar/ has to have some feature that prevents it from surfacing there. Since

[9] We note that the /-um/ suffix also surfaces in masculine singular dative contexts. Leaving the suffix unspecified for number allows us to capture this syncretism.

/-ar/ surfaces in nominative environments, case can't be the distinguishing feature. Therefore, this suffix has to be specified as [+plural]. As noted above, it has to be [+feminine] to keep it from surfacing in neuter environments. We can't stop here, however. We need to give this suffix a case feature, too. As (19) shows, without a case feature, /-ar/ is compatible with feminine oblique cells, too (and is more specific than /-um/).

(17) *Tentative feature assignments.*

a. /-ar/	b. /-ra/	c. /-um/
[+feminine]	[+oblique]	[+oblique]
[+plural]	[+genitive]	
([-oblique])		

We have to assign /-ar/ the feature [-oblique] so that it is incompatible with environments in which the relatively general oblique suffixes surface.

The same basic considerations apply to the masculine non-oblique cells. Both have to be [+masculine] to preserve the contrast with the neuter form. Likewise, both have to be [-oblique] to forestall competition with the oblique forms. One of the masculine desinences also has to have a secondary case feature, since the masculine forms contrast with each other only along this dimension. These forms also contrast with masculine singular nominative and accusative suffixes. Either the singular forms or the plural forms have to be marked for number. We'll assign the number feature to the plural desinences. We could do it the other way around; there is no very good way to know which is more appropriate. So long as one set in the contrast has the feature, there is no effect on the analysis.

3.7.2. The weak paradigm.

Now we turn to the weak paradigm. Deciding on the distribution of features in this paradigm is somewhat simpler, due to its relative paucity of desinences. Furthermore, we already saw that that strong inflection is neutral with respect to definiteness, and weak inflection is barred from indefinite contexts. Accordingly, all suffixes in the weak paradigm must bear the feature [+definite].

Table 3.4. The weak adjective paradigm and associated features.

<table>
<tr><td>singular</td><td>MASCULINE</td><td>NEUTER</td><td>FEMININE</td></tr>
<tr><td>NOMINATIVE</td><td>gul-i
[+masculine]
[+nominative]
[-plural]
[+definite]</td><td rowspan="4">gul-a
[+definite]</td><td rowspan="4">gul-u
[-nominative]
[+feminine]
[+definite]</td></tr>
<tr><td>ACCUSATIVE</td></tr>
<tr><td>GENITIVE</td></tr>
<tr><td>DATIVE</td></tr>
<tr><td>plural</td><td colspan="3"></td></tr>
<tr><td>NOMINATIVE</td><td rowspan="4" colspan="2">gul-u
[+plural]
[+definite]</td><td rowspan="4"></td></tr>
<tr><td>ACCUSATIVE</td></tr>
<tr><td>GENITIVE</td></tr>
<tr><td>DATIVE</td></tr>
</table>

Consider first the plural suffix /-u/. Of the four concord categories (gender, case, number, and definiteness) this suffix can only have features for two. Specifically, it can only have the features [+definite] and [+plural]. It can't have any feature for gender, since the suffix can modify nouns of any gender. Likewise, it can't have case features, since it occurs in all four case environments.

The most specific suffix in the paradigm is the masculine nominative singular /-i/. This suffix has to have the features [+masculine] and [+nominative] to separate it from all other singular cells. The feature [+masculine] keeps the form from showing

up in feminine cells, and the feature [+nominative] prevents the form from appearing in other cases. The fact that the more general plural /-u/ suffix surfaces in the nominative masculine plural means that /-i/ has to be marked [-plural] to keep /-i/ from appearing in masculine nominative plural environments.

We suggest that there are two homophonous /-u/ suffixes. While it would be nice to provide a single definition for these suffixes, the contexts in which /-u/ occurs do not constitute a natural class with respect to the features we have chosen. For instance, the plural variant is compatible with nominative case, while the feminine singular variant is not. Oddly, the two suffixes compete in the non-nominative plural cells (shaded). We discuss this fact later.

Finally, consider the singular suffix /-a/. No set of features will describe all and only the cells in which the /-a/ suffix occurs. However, such specificity is not needed with underspecification and the Blocking Convention. The suffix /-a/ needs only a single feature: [+definite]. As we have seen before, this suffix cannot have a value for a gender feature, since it modifies nouns of any gender. Likewise, the form occurs in all four cases, so assigning any case features would improperly make the form incompatible with some environment. It is not necessary to assign a number feature, since one of the /-u/ suffixes is marked as [+plural] and [+definite]. That is, the suffix /-u/ will be incompatible with all singular contexts in which /-a/ occurs, and it is more specific than /-a/ in all plural contexts, by virtue of having a feature that /-a/ doesn't. Note that /-a/ is now compatible with *all definite contexts*. Another way of thinking about this form is that it is the default definite exponent. It is a *potential*

exponent of *every* cell in the weak paradigm. By allowing such extreme underspecification as we do, we effectively fill numerous cells in a paradigm with multiple exponents. We leave it to the constraints that constitute the morphology-syntax interface to choose from amongst the various potential exponents for a given syntactic context.

3.7.3. The feature [nominative].

The weak paradigm provides some evidence for positing a feature [nominative], as opposed to a feature that would pick out nominative and genitive simultaneously. It appears that both the nominative masculine singular and the feminine /-u/ suffix have to refer to the nominative case. It would have been possible to set up only two case features to deal with the four cases of Icelandic. One feature, call it [+/-oblique] would separate genitive and dative ([+oblique]) from nominative and accusative, while another feature, call it [+/-governed], could pick out accusative and dative ([+governed]) from nominative and genitive ([-governed]). These alternative feature constellations are given in (18). Thus, both nominative and genitive would be [-governed]. While the nominative singular /-i/ could be marked both [-oblique], and [-governed], the same is not true of /-u/.

(18) *alternative case features.*

nominative	**genitive**
[-oblique]	[+oblique]
[-governed]	[-governed]
accusative	**dative**
[-oblique]	[+oblique]
[+governed]	[+governed]

If we had to use a two feature system for case we would need to posit one /-u/ suffix for the feminine genitive singular, one for the feminine accusative and dative cells, and a third for the plural cells, the first two of these are given in (19). Because it has the feature [+governed], (19a) would be prevented from occurring in nominative environments, but it would also be blocked from occurring in the genitive, which would be, like nominative, [-governed]. We would therefore need a homophonous suffix (19b), specific to the genitive, with the features [-governed], [+oblique].

(19) *alternative weak /-u/ specifications*

a.	*–u*	b.	*–u*
	[+governed]		[+oblique]
	[+definite]		[-governed]
			[+definite]

Either approach entails a certain amount of complication. A two-feature system requires a larger paradigm, a three-feature system requires an extra feature. We opt for the latter approach as it appears to describe the paradigm better.

In sum, we have argued that there are 4 suffixes in the weak paradigm. Each suffix is at least [+definite]. We have also showed why we chose to represent the four-case system of Icelandic in terms of three, rather than two, features. In the next section we discuss the more intricate strong paradigm.

3.8. Paradigms and exponence.

The conception of paradigmatic structure that we are promoting means that the paradigms themselves are far from tidy. That is, desinences overlap considerably with one another. In both the strong and the weak paradigms, cells may have multiple

potential occupants. For instance, the bare stem in the neuter non-oblique plural is a potential exponent of every cell in the paradigm, the oblique /-um/ suffix is common to all oblique cells, and so on. Furthermore, insofar as all strong cells are neutral regarding definiteness, all of these suffixes are also potential exponents of the respective cells in the weak paradigm, but that, of course, is the problem we started off with. By way of illustration, let's consider which cells in the paradigm are potential exponents of a masculine nominative plural definite syntactic environment. The full syntactic description is given in (20), the compatible suffixes in (21).

(20) *Morphosyntactic description of a masc.nom.pl.def. NP*

GENDER:	[+masculine]
	[-feminine]
CASE:	[-oblique]
	[+nominative]
NUMBER:	[+plural]
DEFINITE:	[+definite]

(21) *Forms compatible with the environment in (20)*

a. gul**ir**	b. gul**a**	c. gul*u*	d. gul*a*	e. gul	f. gul-ur
[+masc]	[+masc]	[+def]	[+def]		[+masc]
[-obl]	[-obl]	[+plu]			[-obl]
[+nom]	[+plu]				[+nom]
[+plu]					

So, the cell described by the features in (20) has 6 distinct potential occupants.[10] How to choose among these forms in the appropriate contexts is the topic of the next section. Notice, however, that all of the forms in (21) are underspecified in some way, no form faithfully expresses *all* of the features in (20). Now take a closer look at the forms (21a) and (21c). While neither of these forms expresses all of the features in (20), the conjunction of features associated with these forms expresses more features of the syntactic representation than any single exponent. Interestingly, an NP that fits the description in (20) which contains an attributive adjective will contain both of these suffixes, as shown in (22).[11]

(22) gul-*u* hest-ar-n-**ir**

yellow-pl.def horse-masc.nom.pl-the-masc.nom.pl

'the yellow horse'

The examples in (20-22) illustrate the basic generalization that we want to capture about Icelandic NP inflection: using a strong and a weak suffix *together* causes more morphosyntactic properties to be realized in the whole NP than using two suffixes of the same type would. Stated another way, these two suffixes in conjunction result in more faithful morphological realization of properties of the whole NP, sacrificing faithful exponence at the level of the terminal node.

The problem we face in accounting for these patterns of inflection is that the system we outlined in chapter 2 can't produce these arrays. That system always favors

[10] The suffix /-ur/ in (21f) is the masculine nominative singular exponent, which is not discussed in the body of the thesis. See the appendix for the complete Icelandic paradigm.

[11] The noun suffix /-ar/ has the same range in the noun paradigm as the adjective suffix /ir/. We analyze these suffixes as bearing the same features. See appendix 1 for the full paradigms.

all modifiers having the most specific suffix wherever possible. We illustrate this fact with the tableau in (23). Let's take some time to discuss how the tableau should be read. The top cell of the second column contains the syntactic specifications of the terminal nodes of the NP. Recall that syntactic concord requires these nodes to have identical feature specifications. Since the terminal nodes are all identical, we only have to represent this information once in the tableau.

The candidate set occupies the cells below the syntactic specifications. Candidates are constituted by pairing inflected items from the lexicon with syntactic terminal nodes. Every member of the paradigm for a given word appears in the candidate set. The candidate set here is severely truncated. We are only concerned with the form of the adjective. But the full candidate set would also contain candidates in which the noun was differently inflected, and candidates in which the definite determiner was differently inflected.

The top-ranked constraint, NO CLASH, states that morphological features (those associated with the candidates) have to have a correspondent in the syntactic representation (represented in the cell above the candidate set). The second constraint, AGREE, is violated for any deviation between syntactic and morphological feature specifications. As we noted above, by hypothesis, every form in the Icelandic paradigms is in some candidate output. In practice, listing every form of each paradigm in our tableaux is terribly unwieldy. In most cases, though, the majority of forms will be eliminated by NO CLASH. In general, then, we will abbreviate our tableaux by omitting from consideration forms that violate this constraint (there is

always at least one form available that doesn't violate NO CLASH: the unsuffixed, morphosyntactically unmarked form discussed above).

Also, for ease of exposition, where the noun suffix and article suffix are identical, we only give the features of these forms once. Finally, in the AGREE column we indicate the source of the violation, but this is for expository purposes only. We are not positing two AGREE constraints, one for adjectives and one for articles. The same constraint regulates the relationship between terminal node and word across the NP. Since we are holding the article constant, we could also just have concentrated on adjectives.

We see that the Blocking Convention chooses candidate (23a) over the attested (23c), because (23a) instantiates more features on each terminal node in the NP. In other words, the weak form, despite its unique contribution to concord, nonetheless violates AGREE more than the winning strong form.

(23)

	THE,YELLOW, HORSE gend: [+ masculine] [- feminine] case: [- oblique] [+ nominative] num: [+ plural] def: [+ definite]	NO CLASH	AGREE
☞a.	gul-**ir** hest-ar-n-**ir** [+masc] [+masc] [-obl] [-obl] [+nom] [+nom] [+plu] [+plu]		adj: ** art: **
b.	gul-**a** hest-ar-n-**ir** [+masc] [+masc] [-obl] [-obl] [+nom] [+nom] [+plu]		adj: *** art: **!
💣c.	gul-*u* hest-ar-n-**ir** [+plu] [+masc] [+def] [-obl] [+nom] [+plu]		adj: **** art: *!*
d.	gul-*a* hest-ar-n-**ir** [+def] [+masc] [-obl] [+nom] [+plu]		adj: *****! art: **
e.	gul hest-ar-n-**ir** [+masc] [-obl] [+nom] [+plu]		adj: *****!* art: **
f.	all else	*!	

3.9. Maximizing concord.

What we need to account for the facts of Icelandic is a new constraint that outranks AGREE. The constraint should reward NPs that express the most distinct features in total over those whose lexical sub-constituents satisfy AGREE locally (i.e.

for each terminal node). Hence, we propose the constraint in (24), called MAXIMIZE MORPHOSYNTAX IN THE NOUN PHRASE, or MAX-MS, for short.

(24) MAXIMIZE MS/NP: Every morphosyntactic feature of an NP has a correspondent in a morphosyntactic representation in the domain of concord.

The constraint in (24) is violated for every syntactic concord feature that is not morphologically instantiated somewhere in the local NP. The domain of concord has to be defined as the head and its lexical modifiers, excluding phrasal modifiers of some head. The constraint is oblivious to where the features are instantiated, and to how many times a given feature is instantiated. For any syntactic concord feature, one lexical instantiation anywhere in the NP is sufficient to satisfy MAX-MS.

Another way of thinking about this constraint is that it enforces concord from the N^{max} node, while NO CLASH and AGREE enforce concord at the N^0 level.[12] The basic idea is that concord is an NP-level phenomenon, and not, in the traditional formulation, agreement with the head of the phrase. Of the concord features we have discussed so far, only gender is unambiguously an inherent property of nouns. Case depends on the position of an NP in syntactic context, while definiteness depends on discourse properties of the NP and/or utterance. Number, too, depends on the semantics of the NP. Most theories of syntax have some mechanism for assigning

[12] Actually, all concord could be reconceptualized in terms of NP level correspondence. NO CLASH and AGREE would just have to range over all agreeing nodes in the NP.

concord features to the maximal projection. Features from the head have to percolate up the NP, while clausally determined features, like case, have to percolate downward. In HPSG, for instance, the Head Feature Convention requires featural identity between mothers and daughters. In LFG, the c-structure NP node is in correspondence with the relevant part of the associated F-structure. Whatever the mechanism, for this constraint to work, there has to be some representation of the concord features relevant to the whole phrase. Let's see how this constraint solves the Blocking Convention problems discussed above.

We can get the desired results by ranking MAX-MS above AGREE. This is illustrated in (25), which shows the same context from tableau (23), but with MAX-MS added in. Now we get the right results. Candidate (25c) is more harmonic than (25a), because five of the six morphosyntactic features are instantiated in (25c) as opposed to four in (25a). The adjective contributes at least the feature [+definite] towards the satisfaction of MAX-MS. The feature [+plural] is instantiated on both the adjective and article, so either form is sufficient to satisfy MAX-MS. As we saw above, candidate (25a) would be the winner if AGREE outranked MAX-MS, showing that MAX-MS crucially outranks AGREE. We also see from this tableau, however, that the constraint AGREE is necessarily still active in Icelandic. Candidate (25d) also satisfies MAX-MS better than (25a); however, AGREE causes (25d) to be rejected, since the adjective in (25c) has more features in common with its containing syntactic terminal node.

(25)

	THE, YELLOW, HORSE gend: [+ masculine] [- feminine] case: [- oblique] [+ nominative] num: [+ plural] def: [+ definite]	NO CLASH	*MAX-MS*	AGREE
a.	gul-**ir** hest-ar-n-**ir** [+masc] [+masc] [-obl] [-obl] [+nom] [+nom] [+plu] [+plu]		**!	adj: ** art: **
b.	gul-**a** hest-ar-n-**ir** [+masc] [+masc] [-obl] [-obl] [+nom] [+nom] [+plu]		**!	adj: *** art: **
☞c.	gul-*u* hest-ar-n-**ir** [+plu] [+masc] [+def] [-obl] [+nom] [+plu]		*	adj: **** art: **
d.	gul-*a* hest-ar-n-**ir** [+def] [+masc] [-obl] [+nom] [+plu]		*	adj: ***** art: **!
e.	gul hest-ar-n-**ir** [+masc] [-obl] [+nom] [+plu]		**!	adj: ****** art: **
f.	all else	*!		

3.10. NO CLASH >> MAXIMIZE.

The constraint NO CLASH eliminates inflected forms which clash with the targeted syntactic context. Since this constraint enforces compatibility between

syntactic and morphological representations, is still necessary to this account, and must outrank both MAX-MS and AGREE. Given the variability in the number of features associated with the different suffixes, NO CLASH has to outrank MAX-MS to prevent incompatible but highly specified forms from beating out compatible forms with fewer features when features associated with the more marked form constitute a subset of the features required by the syntax. This issue is particularly clear when unsuffixed (and hence morphosyntactically unmarked) forms are involved. Tableau (26) depicts part of the competition for lexical expression of a neuter nominative singular indefinite syntactic context. In this context both the adjective and the noun are unsuffixed. The oblique plural forms in (26b) or (26c) would be compatible with this environment except for the feature [-oblique]. This shows that it doesn't matter where NO CLASH is violated, it still causes a candidate to be rejected. The candidate in (26d) satisfies MAX-MS better than any other candidate, but its [+masculine] feature clashes with the [-masculine] syntactic environment. However, since NO CLASH outranks MAX-MS, the single conflicting feature is enough to remove the masculine nominative singular form from competition. Candidate (26d) and all other possible candidates violate NO CLASH at least once.

(26)

	(A), YELLOW, SHELL case: [- oblique] [+ nominative] gend: [- masculine] [- feminine] num: [+ plural] def: [- definite]	NO CLASH	MAX-MS/NP	AGREE
☞a.	gul blóm		******	***** / ******
b.	gul-um blóm [+obl]	*! [obl]	******	**** / **
c.	gul blóm-um [+obl]	*! [obl]	******	***** / *!*
d.	gul-ir blóm [+masc] [-obl] [+nom] [+plu]	*! [masc]	**	**** / ***
e.	…	*!		

3.11. Conclusion.

In this chapter we argued that desinences in the weak paradigm are morphosyntactically less specific than features in the strong paradigm. However, weak forms surface alongside strong forms in definite NPs in apparent violation of the Blocking Convention. We argued that strong forms, since they appear in both definite and indefinite contexts, must not bear a morphosyntactic concord feature for definiteness. In contrast, weak forms are barred from surfacing in indefinite contexts, and hence must be [+definite]. As a result, weak forms are the only source for the

morphological expression of definiteness in the NP. We observed that weak and strong forms together may express more morphosyntactic features than either suffix alone could. In order to allow weak suffixes to surface in such contexts we proposed the constraint MAX-MS. By ranking this feature between the two constraints posited for Swedish, weak forms surface in appropriate contexts. This fact allows for more faithful representation of morphosyntactic properties of the whole NP at the expense of morphosyntactic faithfulness to individual terminal nodes.

The fact that a third constraint can intervene between the two constraints that constitute the Blocking Convention lends support to our contention that morphological blocking is not a unitary phenomenon. In the next chapter, we show that the same phenomenon occurs in German, though the cause of the alternation is a case feature, rather than definiteness. Furthermore, we argue that accounting for patterns of inflection in German requires yet another constraint to intervene between NO CLASH and AGREE.

Chapter 4

A Problem in German Grammar: Weak Adjective Inflection, Morphological Blocking, and Economy in Morphosyntax.

4.1. Introduction.

German, like Icelandic and Swedish, countenances a systematic alternation of adjective suffixes in noun phrases. Like those other languages, it appears that morphosyntactically less-specific adjective forms surface in lieu of more specific compatible forms under certain conditions. However, the German phenomenon presents some complications not seen in either Swedish or Icelandic. In particular, it is not always the case that the alternation is triggered by the presence of a specific morphosyntactic property such as definiteness. Second, the German paradigms are more fluid, in the sense that both the strong and the weak paradigm may appear on both specifiers and on attributive adjectives, depending on the order of items and combination of adjective types. Finally, German displays a somewhat finer gradation of morphosyntactic markedness in its paradigm structure. Specifically, both unmarked bare stems and unmarked suffixes participate in paradigmatic alternations, as do 'default' suffixes for a given category.

In order to account for the German facts, we will require the three constraints discussed so far, as well as a fourth constraint, ranked among the others, which enforces economy of expression of morphosyntactic features associated with adjectives. In addition, we will discuss a final constraint on inflection necessary to

account for a peculiarity common to all three Germanic languages discussed in this thesis.

The analysis of German is consistent with the analyses of Swedish and Icelandic, and I will argue that it is superior to other recent analyses of this phenomenon, insofar as it accounts for all of the data, including data not treated in the other accounts, and it provides an explanation of certain facts accounted for only by stipulation elsewhere.

4.2. Overview

In this chapter we'll first provide an overview of the problem, and discuss why it has important implications for morphological theory. We then provide a brief examination of the two paradigms at issue, and demonstrate the relevant generalizations over patterns of inflection in the German NP. Next, we'll argue that neither full specification of morphosyntactic features, nor the traditional formulation of the Elsewhere Condition are sufficient to account for the observed patterns of inflection. After reviewing two recent analyses of the problem, we will argue that a further addition to the NCA Blocking Convention, in the form of an economy constraint on the expression of morphosyntactic features, is sufficient to account for the main generalizations regarding the strong/weak adjective alternation in German.

4.2.1. The problem.

For any well-formed set of morphosyntactic concord features in German, there are (at least) two compatible adjective suffixes. Compare examples (1) and (2). Both noun phrases are neuter, non-oblique (nominative or accusative), singular. The attributive adjective in (1) bears a suffix, /-es/, drawn from the *strong* paradigm, while the attributive adjective in (2) bears a suffix , /-e/, drawn from the *weak* paradigm.

(1) ein **gut-<u>es</u>** Bier. *neuter nom/acc singular*

a good beer

'a good beer'

(2) dies-<u>es</u> **gut-*e*** Bier.

this good beer

'this good beer'

Unlike Swedish and Icelandic, German adjective inflection is not sensitive to definiteness. Comparison of the examples in (3) and (4) shows that indefinite specifiers, like *ein* 'a', and *manch* 'such', and definite specifiers like *mein* 'my', and *dies-* 'this' behave identically with respect to patterns of inflection.

(3) a. ein gut-<u>es</u> Bier.

a good-nt.sg beer

'a good beer.'

b. mein gut-<u>es</u> Bier

my good-nt.sg beer

'my good beer.'

(4) a. mit dies-em gut*en* Bier
with this-dat.sg good Beer
'with this good beer.'

b. mit manch-em gut*en* Bier.
with some-dat.sg good beer
'with some good beer.'

Since these patterns don't arise as a result of morphological sensitivity to definiteness, another source for the alternation must be found.

4.2.2. Why is this a problem?

As is by now familiar, in models of morphology and the morphology/syntax interface that countenance competition between potential realizations of morphosyntactic content, the principal arbiter of the competition is the Elsewhere Condition (Kiparsky 1973), which is also known as *morphological blocking* (Andrews, 1990, Anderson 1992, Bochner 1993), or *Pānini's Principle* (Stump 2001). The Elsewhere Condition states, in effect, that where two forms are in competition, the morphosyntactically more specific form blocks the more general form. The same basic generalization holds of our MCA Blocking Convention (without the subset requirement). As a result, there should be a unique morphological exponent for any licit morphosyntactic context. Such is clearly not the case in German. I argue that because its fewer desinences occur in a wider variety of morphosyntactic environments, the German weak paradigm is less specific than the strong paradigm.

However, if they are less specific than the strong suffixes, it is unclear why weak suffixes are not ruled out by the Blocking Convention whenever more specific compatible strong suffixes are available. Furthermore, doing away with the Blocking Convention in favor of a model of morphology that requires full lexical specification of morphosyntactic features, and extrinsically ordered rules will not solve the problem, since, as I argue in subsequent sections, the morphosyntactic featural descriptions in phrases like (1) and (2) are identical. The solution to this problem lies neither solely in the syntactic component, nor in the lexicon, but in their interaction.

In this chapter we continue to argue for a model of concord in OT which incorporates the Blocking Convention as a basic component. But we argue that we must allow the Convention to be overridden yet again if we want to account for German strong/weak adjective alternation under the rubric of concord. In addition, this analysis is able to capture a number of generalizations that have eluded previous accounts of the phenomenon.

4.3. German adjective inflection.

In this section we describe the inflectional paradigms of German adjectives, and point out some important generalizations. The syntactic factors determining whether an item will be inflected according to the strong or weak paradigm will be discussed in the next section.

4.3.1. A closer look at the paradigms.

Generally speaking, there are two types of inflected nominal modifiers in German: specifiers (including determiners, demonstratives, possessive adjectives, and various quantifiers), and attributive adjectives. Syntactically, attributive adjectives are prohibited from appearing in Det, as we will show in a subsequent section. Specifiers typically appear in Det, but may, in certain circumstances, appear in Adjective Phrases as well.

The strong adjective paradigm for attributive adjectives and specifiers is given in table 4.1. With a few exceptions, both specifiers and attributive adjectives may be inflected according to this paradigm, depending on syntactic context. Particular attention should be paid to the following exceptions and generalizations:

(5) a. There are no gender distinctions in the plural.

b. In the genitive singular, attributive adjectives always surface in their weak form, while specifiers bear strong morphology. Importantly, these are the only singular cells in which the noun is also inflected.

c. Masculine accusative singular is the only accusative cell that differs from the nominative of the same gender.

Table 4.1. Strong Adjective Paradigm.

<table>
<tr><th></th><th>MASC</th><th>NEUT</th><th>FEM</th><th>PLURAL</th><th>MASC</th><th>NEUT</th><th>FEM</th><th>PLURAL</th></tr>
<tr><td>NOM</td><td>gut-er</td><td rowspan="2">gut-es</td><td rowspan="2">gut-e</td><td rowspan="2">gut-e</td><td>dies-er</td><td rowspan="2">dies-es</td><td rowspan="2">dies-e</td><td rowspan="2">dies-e</td></tr>
<tr><td>ACC</td><td>gut-en</td><td>dies-en</td></tr>
<tr><td>GEN</td><td colspan="2">gut-en</td><td rowspan="2">gut-er</td><td></td><td colspan="2">dies-es</td><td rowspan="2">dies-er</td><td></td></tr>
<tr><td>DAT</td><td colspan="2">gut-em</td><td>gut-en</td><td colspan="2">dies-em</td><td>dies-en</td></tr>
<tr><td></td><td colspan="4">Attributive Adjective Paradigm: 'good'</td><td colspan="4">Specifier Paradigm: 'this'</td></tr>
</table>

Table 4.2 shows that a sub-class of specifiers, traditionally called *ein*-words, is uninflected in masculine nominative singular and neuter non-oblique singular. Included in this class of words are *ein* 'a', and *kein* 'no', as well as possessive adjectives (*mein* 'my', *dein* 'your', etc.). Otherwise the paradigms for specifiers are identical. The paradigm for these words is referred to as the 'mixed' paradigm in traditional grammar. While this data plays an important role in our account, we do not henceforth refer to the mixed paradigm as such, but consider the defective paradigm to be a lexical property of a specific set of specifiers.

Table 4.2. Strong and 'mixed' specifier paradigms.

	MASC	NEUT	FEM	PLURAL	MASC	NEUT	FEM	PLURAL
NOM	dies-er	dies-es	dies-e	dies-e		kein	kein-e	kein-e
ACC	dies-en				kein-en			
GEN	dies-es		dies-er		kein-es		kein-er	
DAT	dies-em			dies-en	kein-em			kein-en
	Strong Specifier Paradigm: 'this'				Mixed Specifier Paradigm: 'no'			

The strong and weak paradigms for attributive adjectives are compared in table 4.3. Typically, only attributive adjectives will be weakly inflected. However, if there is more than one specifier in a noun phrase, one will be strongly inflected, and the other will be weakly inflected. That is, either type of modifier may be weakly inflected in the right circumstances; we discuss these circumstances below (cf. examples (25-26)). Important observations about table 4.3 are given in (6).

(6) a. The suffix /-*e*/ occurs in non-oblique singular cells except for masculine accusative singular (cf. (3c)).

b. The suffix /-en/ occurs in all plural contexts.

c. The suffix /-en/ occurs in all oblique contexts.

Table 4.3. Strong and Weak Adjective Paradigm: *gut* 'good'

	Strong Paradigm				*Weak Paradigm*			
	MASC	NEUT	FEM	PLURAL	MASC	NEUT	FEM	PLURAL
NOM	gut-er	gut-es	gut-e	gut-e	gut-e			
ACC	gut-en							
GEN	gut-en		gut-er		gut-en			
DAT	gut-em			gut-en				

Having seen the paradigms in the abstract, in the next section we show the conditions under which each affix type occurs.

4.3.2. Distribution of the forms.

In this section we lay out explicitly the inflectional patterns found in the German NP. To make the patterns easier to see, in these examples and throughout the chapter strong suffixes are underlined and weak suffixes are in italics, attributive adjectives are in boldface.

- *Generalization 1:* Attributive adjectives are <u>strong</u> if there is no strong inflection elsewhere in the NP.[1]

Example (7) shows an NP with no specifier, and no inflection on the head noun, hence we find strong inflection on the attributive adjective. Example (8)

[1] Although attributive adjectives modifying the same N^0 are always identically inflected.

contains a specifier which is indeclinable in the neut.nom/acc.sg and masc.nom.sg (cf. Table 4.2 above). Since the strong affix can't appear on the article or head noun, it appears on the attributive adjective.[2]

(7) ohne **gutes** Bier *neuter accusative singular*

without good beer

(8) ohne ein **gutes** Bier *neuter accusative singular*

without a good beer

- *Generalization 2:* Attributive adjectives are *weak* if there is strong inflection elsewhere in the NP.[3]

In (9-10), strong affixes on the specifier mean that the attributive adjective surfaces with a weak suffix. Note, by the way, that this generalization is independent of the definiteness of the NP, *dieses*, 'this', is a definite specifier, while *ein*, 'a', is indefinite (attributive adjectives in boldface).

(9) ohne dieses **gute** Bier *neuter accusative singular*

without this good beer

(10) a. mit einem **gute*n*** Bier *neuter dative singular*

with a good beer

b. *mit einem **gutem** Bier.

In (11a), a strong affix on the head noun means that the adjective surfaces with weak inflection.

[2] The prepositions in these examples assign case to the governed NPs: *ohne* 'without' assigns accusative case, *statt* 'instead of' assigns genitive case in many dialects, and *mit* 'with' assigns dative case.
[3] As we discuss below, *elsewhere* means outside of the AP (i.e. on the noun or specifier).

(11) a. statt **gut*e**n* Bier<u>es</u> *neuter genitive singular*

instead of good beer

b. *statt **gut<u>es</u>** Bier<u>es</u>

instead of good.gen.sg beer.gen.sg

'instead of good beer.'

4.3.3. Zones of Inflection in the German NP.

There are three zones of inflection in the German NP. These zones correspond to the determiner node, the adjective phrase, and the head noun. Of these zones, only the adjective phrase may have multiple occupants, all of which must be identically inflected. As we saw in the previous sub-sections, when strong inflection appears in either the determiner or the noun zone, weak morphology appears in the adjective zone. Strong morphology appears in the adjective zone just in case there is no strong morphology in the other two zones.

The determiner zone is limited to a single occupant which must be a specifier, never an attributive adjective. The examples in (12) demonstrate the point that attributive adjectives are prohibited from occuring in Det.

(12) a. dies-<u>es</u> gut-*e* billig-*e* Bier.

this-nt.sg good inexpensive beer

'this good inexpensive beer"

b. *gut-<u>es</u> billig-*e* Bier.

good-nt.sg inexpensive Beer

c. gut-<u>es</u> billig-<u>es</u> Bier.

good-nt.sg inexpensive.nt.sg beer

'good inexpensive beer'.

When more than one specifier occurs in an NP, the second occurs in the AP, not in Det, in which case the specifier is inflected like co-occuring atributive adjectives, either according to the strong paradigm, as in (13), or according to the weak paradigm, as in (14), following the generalizations laid out above.

(13) jed-<u>es</u> **solch-*e*** gut-*e* Bier.

every-nt.sg such good beer

'every such good beer'.

(14) ein **solch-<u>es</u>** gut-<u>es</u> Bier

a such-nt.sg good-nt.sg Beer

'one such good beer.'

(15) **solch-es** gut-*e* Bier.

such-nt.sg good beer

'such good beer'

In example (15) we see that *solch* (such) functions as a specifier. Importantly, comparison of the specifier *solch* 'such' in (13-15) shows that, unlike Icelandic specifiers, specifiers in German may take either strong or weak inflection.

4.4. What these patterns *aren't* attributable to.

In this section we endeavor to rule out certain potential explanations for the observed alternation.

4.4.1. The strong/weak alternation is not sensitive to definiteness.

Strong suffixes may occur on adjectives in indefinite NPs when there is no specifier, as in (16), and when the specifier is indeclinable, as in (17).

(16) mit **gut<u>em</u>** Bier.

'with good beer.'

(17) ohne ein **gut<u>es</u>** Bier.

'without a good beer.'

Weak suffixes occur on adjectives in indefinite NPs when the specifier is inflected, as in (18):

(18) mit ein<u>em</u> **gut*en*** Bier.

'with a good beer.'

Definite NPs may also contain both strong and weak suffixes. Strong suffixes occur on specifiers, and weak suffixes occur on attributive adjectives:

(19) ohne dies<u>es</u> **gut*e*** Bier.

'without this good beer.'

Examples (16-19) show that both suffix types can occur in definite or indefinite NPs. Hence, unlike Swedish and Icelandic, the definiteness of the NP is not the basis for the alternation in the form of the adjective.

4.4.2. The presence or absence of a specifier.

The appearance of weak inflection cannot be attributed to syntactic properties of the NP, nor to, e.g., selectional properties of specifiers, since weak adjective suffixes show up both in NPs with determiners, as in (20), and in NPs without determiners, as in (21).

(20) dies<u>es</u> gut*e* Bier. *neuter nom/acc. singular*
this good beer

(21) statt gut*en* Bier<u>es</u> *neuter genitive singular*
instead of good beer

Likewise, strong morphology shows up in NPs with determiners, as in (22), and in NPs without determiners, as in (23).

(22) ein gut<u>es</u> Bier *neuter nom/acc. singular*
a good beer

(23) mit gut<u>em</u> Bier *neuter dative singular*
with good beer

(24) mit ein<u>em</u> gut*en* Bier *neuter dative singular*
with a good beer

Comparison of examples (22-24) suggests that the appearance of weak adjective morphology reflects the presence of specific inflectional suffixes in the NP, rather than the presence of specific specifiers.

4.4.3. Presence of a specific type of specifier.

As discussed in section 4.3.3, the same specifier may occur with a strongly inflected attributive adjective in one instance, and a weakly inflected adjective in another. In example (25), the specifier *solch-*, 'such', appears with a strongly inflected adjective, whereas the same specifier in (26) occurs with a weakly inflected adjective. Also, compare examples (22) and (24) in this regard. These facts are difficult to explain if lexical/selectional properties of the specifier influence properties of the adjective. We take this issue up again in section 4.6.

(25) ein **solch-<u>es</u>** gut-<u>es</u> Bier *neuter nom/acc singular*

a such good beer

'such a good beer'

(26) jed-<u>es</u> **solch-*e*** gut-*e* Bier *neuter nom/acc singular*

every such good beer

'every good beer like this one'

It is also important to note that examples (25-26) also provide evidence that specifiers in German may be weakly inflected in some circumstances, unlike Icelandic specifiers.

4.4.4. The Strong / Weak alternation does not involve full specification of morphological forms.

We have seen that the strong/weak alternation is not attributable to syntactic configuration, nor to properties of particular determiners. Furthermore, German

strong or weak inflection is not attributable to the presence or absence of the morphosyntactic feature [+/- definite] in the NP. Consider the neuter accusative singular examples in (27). Since, as discussed above, definiteness is not encoded morphologically in German, the morphosyntactic specifications of these NPs are identical. This means that even if we exhaustively specify all relevant morphosyntactic features for weak and strong forms (at the cost of wide-spread homophony), the Blocking Convention would still not yield the right results, because the two forms (*gutes*, and *gute*, in this example) would have to have identical morphosyntactic properties. If these forms were associated with the same morphosyntactic feature set, the grammar would have no basis for deciding between forms.

(27) a. ohne ein gutes Bier *neuter accusative singular*
with a good beer

b. ohne dieses gute Bier
without this good beer.

4.5. Summary and Key Generalizations.

German attributive adjectives may be inflected according to either the strong or the weak paradigm. The strong paradigm consists of inflectional exponents which are less specific than the inflectional exponents in the weak paradigm. Nevertheless, weak suffixes do surface in German NPs. The distribution of weak suffixes is not directly attributable to the presence of certain specifiers, nor to particular properties of

specifiers in Det. Hence, German appears to provide an example in which the Blocking Convention is overridden.

The key generalizations regarding this phenomenon thus appear to have to do with the presence of inflection within the NP:

(28) a. Attributive adjectives are strong if there is no strong inflection elsewhere in the NP.

b. Attributive adjectives are *weak* if there is strong inflection elsewhere in the NP.

4.6. Previous Approaches.

There are two relatively recent attempts to treat the German adjective alternation. Both of these approaches posit an *ad hoc* declensional feature to distinguish the strong from the weak paradigm. The phonological form of the adjective in these accounts is dependent on the value of this feature, as determined by syntactic and lexical properties of accompanying items in the NP. We argue that proposals like these are problematic on a theoretical level, and also fail to capture important lower-level generalizations about patterns of inflection in the NP. In this section we discuss each of these proposals in turn.

4.6.1. Declension Government.

Zwicky (1986) proposes an account of German adjectival concord from within the framework of Generalized Phrase Structure Grammar (GPSG). The assumption

underlying his proposal is that "adjectives […] belong to no declension class lexically, but are assigned to a class by virtue of the type of determiner with which they are in construction" (961).

Under his analysis, two syntactic principles specific to German, called *declension government* and *declension inheritance*, work in conjunction to override the default strong inflection of the adjective and impose weak inflection on the adjective in the presence of certain determiners.

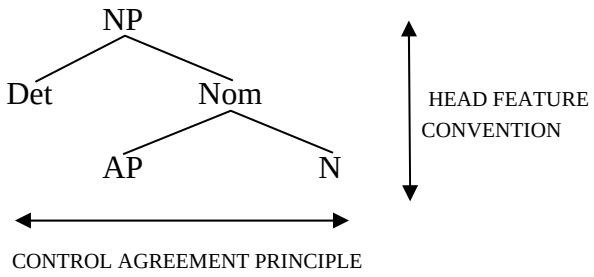
4.6.1.1. Concord and agreement in GPSG.

Noun phrase concord and other agreement relationships are handled by two principles in GPSG,[4] the Head Feature Convention (HFC) and the Control Agreement Principle (CAP). These two principles work together to ensure that all of the nodes in the noun phrase (or other relevant agreement domain) share identical values for agreement features. Agreement features in German include features for case, gender, and number. As an example of how agreement works, let us briefly consider the property of gender. Gender is an inherent lexical property of nouns, so features for gender originate on the head noun. Broadly speaking, the HFC states that agreement features of a head and its mother must be identical. By this mechanism then, gender features are percolated up from N to Nom (i.e. N'), and ultimately to NP. By the same token, features may be percolated downward from NP to its sub-constituents. The CAP mandates that agreement features on sister nodes also be identical. So, an AP and N^0, as sisters under Nom, must have identical values for their gender features.

[4] The same conventions apply in GPSG's successor, HPSG.

Likewise, the determiner and Nom, as sisters under NP, must have identical values for agreement features. Agreement feature values are propagated downward from AP to its head again by virtue of the HFC. In sum, the HFC requires identity of values for agreement features along the vertical axis, while the CAP requires identity of values for agreement features along the horizontal axis. Agreement (and concord) means that all relevant nodes must have identical values for agreement features if the phrase is to be well-formed.

(29)



The problem in German, as we have seen, is that standard agreement mechanisms, like the HFC and CAP, are insufficient to account for the adjective alternation. Any licit combination of agreement features is compatible with both a strong and a weak adjective suffix.

4.6.1.2. Declension Government and Declension Inheritance.

In order to maintain a uniform account of agreement in GPSG, and still account for German, Zwicky posits a special sort of government relation which he terms *Declension Government*. Under this principle, the value of a declension feature

associated with the attributive adjective may be determined by syntactic government of adjectives by determiners (or, what we are calling 'specifiers').

There are three key ingredients to the Declension Government (DG) analysis: a feature DECL associated both with adjectives and with determiners; the principle of Declension Government; and the principle of Declension Inheritance. In addition, default values for the feature DECL and a set of allomorphy rules also play important roles.

The feature DECL is a feature associated with both determiners and adjectives. Its job is to specify which paradigm the surface form of the lexical item in question is to be drawn from. For determiners there are three possible values for DECL, one specifying the strong paradigm[5] (in the case of *der*-words), one specifying the mixed paradigm[6] (in the case of *ein*-words) or one specifying that the determiner is uninflected (for, e.g., numerals greater than one). For adjectives, the feature DECL may have one of four values: strong, weak, mixed, or indeclinable. The actual surface form of the adjective will be determined by rules of allomorphy. The allomorphy rules use the value of DECL to choose the appropriate paradigm, and the values of the agreement features to choose the appropriate form from within the paradigm specified by DECL.

---

[5] Zwicky calls the strong paradigm the 'universal value' and writes the value for the feature DECL as U. In the attempt to avoid adding to the reader's confusion, I have changed Zwicky's terminology to conform to that used in the rest of the thesis.

[6] The term *mixed* paradigm is from traditional grammar, and refers to the strong paradigm formed by *ein*-words, which is defective in the masc.nom.sg and neut.non-oblique.pl. See section 4.3.1 for further discussion.

The value of the feature DECL is lexically fixed for determiners. But, the value of this feature can vary for attributive adjectives. The default value of DECL for attributive adjectives is DECL = STRONG. In this way, attributive adjectives surface in their strong form in the absence of a determiner.

The mechanism by which an adjective's default STRONG inflection may be overridden is Declension Government, a condition on the branching of an NP node into Det and Nom. The principle is paraphrased in (30) (Zwicky 1986: 986):

(30) *Declension Government:* In a branching of NP into Det and Nom, if Det has the property DECL: STRONG then Nom has the property DECL:WEAK; if Det has the property DECL: MIXED then Nom has the property DECL:MIXED.

Declension Government is similar to the CAP in that it mediates the values of related features of sister nodes, but it is distinct from the CAP in that it only affects the value of the feature DECL. It is also unlike the CAP in that the CAP always enforces identity of agreement features, whereas DG may require different feature values on governor and target.

The final component of this analysis is a principle called Declension Inheritance. This principle is analogous to the previously discussed HFC. Declension Inheritance simply specifies that the value of the feature DECL on Nom must be repeated on its AP daughter. However, since DECL is not, strictly speaking, an agreement feature, it must be invisible to the HFC (and CAP), so that the value of DECL on Nom is not propagated to the head noun.

4.6.1.3. Some Examples of how DG works.

In the absence of a determiner the principles of Declension Government and Declension Inheritance will not come into play. For a phrase like that in (31), the lack of a determiner node means that the conditions for application of Declension Government do not apply. The adjective has no inherent value for the feature DECL and the default specification (STRONG) is supplied. Allomorphy rules select the appropriate form from the strong paradigm.

(31) gut**er** Wein.

'good wine'

If the NP in question is in the non-feminine genitive singular, as in (32), then the process is essentially the same. Declension Government and Declension Inheritance do not apply, since the structural conditions are not met. Hence the adjective must surface in its default form, with the attribute DECL: STRONG. According to this proposal, the adjective *guten* 'good' is *strong* in the non-feminine genitive singular, despite the fact that the adjective suffix differs from the determiner suffix for the same constellation of features. This difference is accounted for in the DG approach by adding a rule to the word formation component.

(32) statt gut*en* Wein**es**.

'instead of good wine.'

If the determiner is strongly inflected, then the adjective will be weakly inflected, as in (33). In this case Declension Government will have a role to play. In the branching of NP into Det and Nom, since Det has the attribute DECL:STRONG,

Declension Government requires that Nom have the value DECL:WEAK (cf. (30) above). Declension Inheritance requires that the AP daughter of Nom also have the attribute DECL:WEAK. Again allomorphy rules are consulted to determine the surface forms of the lexical items. The feature DECL directs the grammar to the appropriate paradigm.

(33) dies**er** gut-e Wein.

this.DECL:STRONG good.DECL:WEAK wine

'this good wine.'

In phrases like the ones in (34), the process is essentially identical to that described in the previous sub-section.

(34) a. ein gut**er** Wein.

‘a good wine.’

b. mit ein**em** gut*en* Wein.

‘with a good wine.’

In both (34a & b) the structural description for the application of DG and DI are met. In this case, however, the values for DECL on Det and Nom (and, by extension AP) will be the same, namely MIXED. The value will signify that the appropriate allomorph will be drawn from the mixed declension, and the grammar will consult the rules of allomorphy for that paradigm.

4.6.1.4. Summary of the DG analysis.

The underlying assumption of this analysis is that properties of a determiner can affect properties of a governed adjective via a special form of syntactic government. If an attributive adjective appears without a governing determiner, it will always be strongly declined according to the global default for adjectives within a noun phrase. However, if an attributive adjective is governed by a determiner, then its form will depend on properties of the governing determiner. If the determiner has the value STRONG for the feature DECL, then the adjective will have the value WEAK for that feature as dictated by Declension Government and Declension Inheritance. The surface form of the adjective will be determined by rules of allomorphy. If the determiner bears the value MIXED for the feature DECL, then the adjective will also bear the value MIXED. Again, rules of allomorphy will dictate the surface form of inflected items.

4.6.1.5. Criticisms of the DG analysis.

We offer three main criticisms of this proposal. First, this analysis introduces unwarranted complications into the syntactic component. Second, the analysis complicates the word formation component of the grammar, and blurs useful distinctions between syntax and morphology. Third, this account misses important generalizations about patterns of inflection in German NPs. In this section, we address each of these concerns in turn.

- The DG analysis complicates the syntactic component.

This analysis requires the addition of two principles to the syntax which have no motivation other than to describe the morphological facts. There are two things that can be said with respect to this point. First, Declension Government is stipulative. Second, Declension Government is too powerful.

- Declension Government is stipulative.

Declension government is to a large degree simply a formalization of the surface descriptive generalization. It says, in effect, if the determiner is STRONG then the adjective is WEAK. If the determiner is from the mixed declension then the adjective is drawn from the mixed declension. It offers no insight into why there is this interplay.

- Declension Government is too powerful.

This point is related to the first. In some cases declension government requires that the values for the feature DECL be the same on the determiner and adjective, and in some cases that they be different. There is no obvious principle underlying the influence that the governing constituent can have on the governed constituent. That is, what constrains the range of possible features that can be subject to a process like declension government, and what constrains the possible effects? Should we be able to introduce principles into the grammar whereby the value of a feature on one constituent can have an essentially arbitrary influence on the value of a feature on some other constituent?

With respect to claims that this approach makes about German morphology, two overarching comments are relevant:

- Declension government treats determiners in a syntactically non-uniform way.

Under the DG analysis constituents that perform the same syntactic function can have different syntactic effects. Specifically, not all determiners behave alike with respect to declension government. One class of determiners imposes one feature value on co-occurring adjectives, another class of determiners imposes a different feature value on co-occurring adjectives, while a third class of determiners does not participate in Declension Government at all. A difference in morphological class of determiners is translated into a syntactic difference, increasing the complexity and redundancy of the grammar.

- Morphosyntactic information is redundantly represented.

Under the DG analysis information about declension class of determiners and adjectives must be represented at several places in the grammar. First, it is clear that determiners are lexically specified as belonging to one class or another. Thus, this information must be included in the determiners' lexical entries. In addition, information about declension class must be included in the rules of allomorphy that select the appropriate adjective suffix. Finally, declension class has to be referred to in the syntactic principles that govern the adjective alternation (i.e. declension government and declension inheritance).

- Declension Government misses an important Generalization.

In the non-feminine genitive singular the adjective ends in *–en* regardless of the presence or absence of the determiner. This is the only environment in which the strong adjective paradigm differs from the *der*-word paradigm, as examples (35-36) demonstrate. Under the DG analysis there is no explanation for this fact. If, as the DG analysis claims, the default adjective declension is STRONG, then the non-feminine genitive singular /*–en*/ suffix must be classified as a strong ending.

(35) a. statt guten Weines

b. * statt gutes Weines

"instead of good wine.'

(36) statt dieses guten Weines.

'instead of this good wine.'

In this section we discussed the Declension Government analysis, which relies heavily on the presence of a morphological class feature called [DECLENSION], and two new syntactic principles to describe the facts of German. In the next section we discuss another recent approach. Although the basic mechanism of the next analysis is different than the DG analysis, it too relies on a declension feature and new syntactic principles to address the adjective alternation.

4.6.2. Declension Agreement.

Kathol (1999) proposes a Head Driven Phrase Structure (HPSG) analysis of the German adjective alternation that is similar to Zwicky's in some respects, but

Kathol attempts to make the feature [DECL] (declension) an agreement feature on a par with features for gender, case, and number. Kathol's underlying assumption is that the declension feature of the adjective is determined primarily by the head noun in the construction. In those cases where the adjective's declension cannot be determined solely by properties of the head noun, then the determiner will influence the Noun's agreement properties under government, and indirectly affect the form of the adjective. As in Zwicky's DG analysis, the surface form of the inflected words is determined by rules of allomorphy, which make use of agreement features for case/gender/number, and the declension feature DECL.

As in the other proposals discussed in this chapter, the distribution of the standard agreement features for case, gender, and number proceeds as usual, with the primary consideration being that determiners, adjectives and nouns within the same local NP have identical values for these features.

Since HPSG is a lexicalist theory of grammar, lexical items are considered rich data structures. They are associated with a variety of morphosyntactic information that determines how they combine in syntactic structures. These structures contain subcategorization information and information about agreement properties.

For the purpose of determining declension class (i.e. strong *vs.* weak inflection) of co-occurring attributive adjectives, only two features of the head noun need concern us. The first is the feature DECL, which may have either the value STRONG or WEAK. The second important feature is the feature SPC which indicates whether the head noun is governed by a specifier.

4.6.2.1. NPs without determiners.

In order to account for strong adjective inflection in determinerless NPs, Kathol imposes a constraint on the category *noun* which states that the value of the DECL feature is STRONG if the value of the SPC feature is undefined. This constraint has the same function as Zwicky's strong default. In other words, this constraint, paraphrased in (37), states that if no specifier is present in the NP, the head noun[7] and any modifying adjectives will be strongly inflected. Since DECL is included among the agreement features of the noun, a co-occurring adjective must have an identical value for this feature. Strong inflection is a consequence of the STRONG value of the feature DECL. Thus, the fact that there is no specifier in the NP in (38) means that the feature SPC is undefined, and hence that the value of the feature DECL must be STRONG.

(37) DECL = STRONG *if* SPC = < >

(38) gut-er Wein

good[DECL:S] wine[SPC: Ø, DECL:S]

'good wine'

4.6.2.2. NPs containing Specifiers.

For the purpose of choosing strong or weak adjective inflection under this proposal, there are two kinds of specifiers in German, those which are inflected (*der*-words, and *ein*-words for most combinations of case, gender, and number), and those which are not (masc.nom.sg, and nt.non-obl.sg *ein*-words, and numerals above 1).

---

[7] In most cases the noun itself cannot be inflected, except where an adjective is nominalized. We treat such constructions as null-headed NPs. We return to this issue below.

Inflected determiners will require that the value of the DECL feature on the head noun be WEAK. Uninflected determiners will require that the value of DECL on head nouns be STRONG.

Kathol proposes a constraint that imposes a requirement on the N' selected by the determiner. Specifically, Kathol proposes a constraint that says: if the surface morphophonology of the inflected form is the same as the morphophonology of its stem, then the value of the feature DECL on a co-occurring N' must be WEAK. If the morphophonology of the determiner's stem and inflected form are distinct, then the value of the feature DECL on the co-occurring N' must be STRONG. In other words, this constraint is a formalization of the descriptive generalization that inflected determiners occur with weakly inflected adjectives, and uninflected determiners occur with strongly inflected determiners. This constraint is paraphrased in (39).

(39) DECL = WEAK *iff* phonology of the stem = phonology of the surface word, otherwise, DECL = STRONG.

Let's take a closer look at how this works. In (40) the inflected determiner *dieser* 'this' is phonologically distinct from its stem *dies-*, hence the constraint in (39) comes into play, and all elements in the NP must have the attribute [DECL:WEAK].

(40) dies<u>er</u> gut*e* Wein.
this[DECL:W] good[DECL:W] wine [DECL:W]
'this good wine'.

Now, the actual phonological value of the suffixes on the various lexical items is determined by word formation rules which take the values of the agreement features

as arguments and return the appropriate suffix. As we can see, the value of the feature [DECL] has no consistent bearing on the suffix that is realized. That is, comparison of examples (38) and (40) reveals that the masculine nominative suffix /-er/ is associated with the feature [DECL:STRONG] in (38), but the feature [DECL:WEAK] in (40). Note that this means that there must be two rules to derive the /-er/ suffix in masculine nominative singular environments, one rule for specifiers, and another rule for attributive adjectives. One rule, for adjectives, specifies a negative value for the feature [DECL], while another rule, for determiners, specifies a positive value for this feature. The phonological shape, and values for all other agreement features, of course, are identical. This situation is repeated throughout the paradigm, yielding significant redundancy in the word-formation component.

4.6.3. A Comparison of the DA and DG analyses.

Although cast in different (but related) formalisms, the parallels between this approach and Zwicky's (DG) analysis are relatively easy to see.

Both proposals incorporate a feature [DECL] into both syntactic principles and morphological word formation rules.

The DG analysis proposed a default value of STRONG to capture the fact that adjectives in determinerless NPs surface with strong inflection. The HPSG substitutes a constraint on the value of DECL so that it is always strong in determinerless NP's.

The principle of Declension Government proposed by Zwicky and the selectional restriction on N' proposed by Kathol are essentially notational variants of

each other. Under Kathol's approach there is a constraint on inflected determiners such that they select an N' which has the value STRONG for the feature DECL. Uninflected determiners select an N' which has the value WEAK for the feature DECL. Declension Government likewise imposed a requirement that the sister to Det have specific values for the feature DECL, although the exact nature of the available values and determiner classes are slightly different between the proposals.

The proposals differ in that Declension Government permits conflicting values for the feature [DECL] on different nodes within the NP. The Declension Agreement analysis requires that all terminal nodes within an NP have the same value for [DECL].

4.6.4. A Critique of the DA analysis.

Insofar as Zwicky's DG proposal and Kathol's DA proposal are similar, they are subject to similar criticisms. Kathol's analysis yields a grammar complicated by parochial principles, introduces unnecessary morphological distinctions into the syntax and fails to explain the occurrence of weak adjective morphology in the non-feminine genitive singular. At the same time, the DA approach makes conflicting claims about noun inflection. Let's examine each of these points separately.

4.6.4.1. Complication of the Grammar.

As we have seen, in addition to the regular machinery necessary to account for NP agreement in HPSG, Kathol's proposal requires two syntactic constraints. One says that DECLENSION = STRONG in NPs lacking determiners, and the other says DECLENSION = STRONG if the determiner is uninflected. These constraints boil down

to little more than descriptive generalizations. Furthermore, this analysis requires that a feature DECL with distinct syntactic effects be introduced to the syntactic component of the grammar. The status of the Declension feature is uncertain. Is it a morphological or a syntactic unit? The analysis begs the question of whether morphological form features should be allowed as agreement features. See the next subsection for further discussion.

4.6.4.2. Unnecessary Morphological Distinctions in the Syntax.

As we noted in our discussion of Declension Government, the feature [DECL] has no obvious syntactic or semantic corollary. Its presence in the grammar is motivated only by the need to account for the adjective alternation. This fact is particularly clear in the Declension Agreement approach, since, as noted in section 4.6.2.2, what would appear to be the same suffix (they are phonologically identical, and appear in the same morphosyntactic contexts) has a different value for the feature [DECL] depending on whether it is associated with a determiner or with an attributive adjective. Thus the number of word formation rules required by the grammar is multiplied, since each putatively distinct set of suffixes must be formed by a distinct set of rules: one set for adjectives, and another for determiners.

4.6.4.3. Non-feminine Genitive Singular.

The shortcomings of the DA approach are particularly apparent in the treatment of the non-feminine genitive singular. Recall that this is the only singular

context in which nouns and specifiers are inflected identically, and the only context in which attributive adjective inflection is invariant across all NP types, and also the only context in which the adjective suffix is different from the determiner suffix in the strong paradigm. Compare the NPs in (41a&b). The noun in both phrases is inflected with what would seem to be a strong suffix, as comparison to the specifier *dies<u>es</u>* in (41b) suggests. At the same time, the adjective in both phrases is inflected with what appears to be a weak suffix. In any case, both noun and adjective have the same inflection in both phrases. Yet Declension Agreement requires that all inflected elements in (41a) have the attribute [DECL:STRONG] by virtue of the constraint in (37) governing NPs lacking determiners. At the same time, all inflected elements in (41b) must have the attribute [DECL:WEAK] by virtue of the constraint in (39) governing NPs containing determiners.

(41) a. statt gut*en* Wein**es**

instead of good.[DECL:ST] wine.[DECL:ST]

'instead of good wine'.

b. statt dies**es** gut*en* Wein**es**

instead of this[DECL:WK] good[DECL:WK] wine.[DECL:WK]

This situation, therefore, requires that there be four distinct word formation rules to produce only two suffixes. Furthermore, this analysis leaves the odd inflection pattern in (41) unexplained: why is the adjective always inflected according to the weak paradigm?

4.7. Desiderata for an account of German NP inflection.

In the next several sections we will present our own proposal to account for German NP inflection. However, before doing so, let us reconsider what lessons can be learned from the previous accounts. Generally speaking, we found fault with previous accounts for their need to develop syntactic processes and principles unmotivated elsewhere in the language, with the fact that they require an excessive number of word-formation rules that (partially) duplicate each other, and with the need for a declension feature ([STRONG]) that is unconnected to any demonstrated morphosyntactic or semantic property. In addition, there are a number of parochial facts about the German adjective paradigm that are unexplained by these approaches. We briefly discuss each of these problems here.

Reliance on an *ad hoc* feature like [STRONG] gives rise to a number of problems for both previous accounts of adjective inflection. Recall that the feature is relevant to both the lexicon (as a component of word formation rules) and to the syntax (as a component feature of syntactic nodes). However, the feature appears to be relevant only on a purely morphological level, for deciding adjective form. More specifically, unlike features for case and number, [STRONG] has no syntactic or semantic correlate. In addition, unlike features for, e.g., number or gender, there are no local or long distance effects of the presence of this feature in syntactic representations. Therefore, the only function of the feature seems to be to describe a morphological form class. If we accept that [STRONG] is a morphological feature of words, then incorporating this feature into syntactic representations would be a

violation of the lexicalist hypothesis (Chomsky 1970, Jackendoff 1975), or lexical integrity principle (Bresnan & Mchombo 1995, Ackerman and Webelhuth 1998), that has so far not been necessary elsewhere.

A second problem with the declension feature is that both accounts are forced to adopt a number of principles or processes in the grammar that specifically target the feature. Zwicky needed the principles of Declension Government and Declension Inheritance, while Kathol required language-specific principles allowing determiners to control agreement, rather than head nouns. The only purpose for these devices is to account for the German adjective alternation. These devices are otherwise unmotivated in the grammar of German.

In several instances, [STRONG] bears no apparent relationship to inflection either on the determiner, or on the noun, though these items may necessarily bear these features as well (cf. examples (38) and (40)). In some instances phonologically identical suffixes are required which bear morphosyntactic feature sets that are identical but for the value of [STRONG]. Thus, the presence of this feature requires a more complex word formation component with significant redundancies.

In addition to the above problems, these accounts fail to explain certain anomalies in the German NP paradigm. In particular, these approaches have nothing to say about the appearance of weak suffixes on attributive adjectives where strong morphology is expected in the non-feminine genitive singular. Also, there is no explanation of why the masculine accusative singular is the only cell in the paradigm in which the weak /-en/ suffix surfaces, rather than the weak /-e/ otherwise found in

direct case singular cells. Furthermore, there is no account of why the non-oblique feminine singular weak exponent is /-e/, while the plural non-oblique weak exponent is /-en/ despite the apparent identity of inflected strong forms.

In sum, we seek to develop an account of this phenomenon that conforms to the strictures in (42).

(42) a. Avoid positing any *ad hoc* declension feature.

b. Avoid the introduction of new syntactic principles.

c. Provide a relatively streamlined set of word formation rules.

d. Explain anomalies of the German NP paradigm.

In the next section we present our proposal for German. We will return to these requirements in subsequent sections and evaluate how well our proposal meets them.

4.8. The Proposal.

In this section we present an OT/correspondence account of German NP-internal inflection. The architecture and constraints argued for in previous chapters are carried over without modification, but will be supplemented by additional constraints. These constraints, in conjunction with careful consideration of the morphosyntactic properties of the adjective paradigms, will account for the full range of inflection data without recourse to declensional features, or positing powerful new syntactic devices. In what follows, we first lay out the morphosyntactic feature inventory needed to describe the German adjective paradigm. Then we re-examine the

contribution of the weak paradigm to the satisfaction of concord in German. Based on that discussion we take another look at the entire paradigm and discuss the distribution of features therein. Next we show why the proposal adopted for Icelandic is insufficient to account for German, and propose a fourth constraint on the association between syntactic and morphological representations that addresses most of the remaining problems. Finally, we discuss the results of the proposal in light of the desiderata outlined in the previous section.

4.8.1. Features in the German paradigm.

In order to describe the German adjective paradigm, we make use of the same set of morphosyntactic features used in Icelandic. There are two significant differences between these features and the ones used by Bierwisch (1967), Zwicky (1986), Blevins (1998), Kathol (1999), and Hughes (2000). First, in this account all features are gender, case, or number features; we do not posit a feature specifying strong versus weak declension. As discussed previously, there are both theoretical and practical advantages to this move; we take this issue up again in subsequent sections. Second, we use three case features, where the other accounts used two. Specifically, we have features that explicitly identify nominative case and genitive case. Previous accounts utilized a feature that grouped nominative and genitive against accusative and dative cases (the feature [oblique] being used to further distinguish the cases). While adopting two features entails a slight complication of the grammar, it brings with it the ability to uniquely identify the nominative cell, which is still necessary for

German in the masculine gender, despite the fact that the German paradigm is considerably smaller than the Icelandic one. The names and a brief description of the features we adopt are given in table 4.4.

Table 4.4. German concord features.

gender:	[+/- masculine]	Neuter gender is non-masculine, non-feminine. No item in the German lexicon has a positive value for both features.
	[+/- feminine]	
case:	[+/- oblique]	The feature [oblique] separates nominative and accusative from genitive and dative. The secondary case features separate nominative from accusative, and genitive from dative.
	[+/- nominative] [+/-genitive]	
number:	[+/- plural]	Distinguishes between singular and plural

4.8.2. Reassessment of the weak paradigm: what function does it serve?

Before going into detail on our proposal for German, let's take another look at the interaction of strong and weak suffixes. What are weak suffixes doing in the paradigm? Does the appearance of weak suffixes contribute anything to the satisfaction of concord? Looked at in isolation, the weak adjective suffixes would seem to contribute very little to the satisfaction of concord in the NP. However, if one looks at weak suffixes in combination with strong suffixes, we find that they actually play a considerable role in resolving ambiguity occasioned by the number of homophonous affixes in the paradigm.[8] Consider examples (43-45), all of which mean, roughly, 'this good one', or 'these good ones' (we analyze these as null-headed

[8] I am distinguishing between syncretism, where two cells are filled by one constellation of ms-feautures, and homophony, where different constellations of ms-fetures have the same phonological spell-out.

NPs, the point is basically the same with normal NPs).[9] In each case, the range of possible meanings of the strong adjective suffix on the specifier is restricted by the identity of the weak suffix on the attributive adjective.

(43) dies-er Gut-*e* *vs.* dies-er Gut-*en*

masc.nom.sg *fem.oblique.sg / gen.pl*

(44) dies-es Gut-*e* *vs.* dies-es Gut-*en*

neut.non-obiquel.sg *non-fem.gen.sg.*

(45) dies-e Gut-*e* *vs.* dies-e Gut-*en*

fem.non-obiquel.sg. *non-obiquel.plural*

This point is illustrated graphically in Table 4.5. Compare masculine nominative singular with feminine oblique, neuter non-oblique singular with non-feminine genitive singular, and feminine non-oblique singular with non-oblique plural. In each of these cases the only phonological difference between forms is to be found on the weak attributive adjective suffix. Thus, if we just consider strong affixes in isolation, there is considerable homophony in the paradigm, but within the context of the whole phrase the presence of a weak suffix helps to resolve ambiguity. There is only one remaining case of homophony now, masculine accusative singular and dative plural. The latter cells can be disambiguated by the dative plural suffix /-n/ associated with nouns in addition to any plural suffix.

[9] Plural morphology on the noun is not typically gender-specific, though it does supply the number feature, diluting this observation only slightly.

Table 4.5. Homophony resolution within the context of the NP

	masc	neut	fem	plu
nom	**dieser Gute**	**dieses Gute**	**diese Gute**	**diese Guten**
acc	(diesen Guten)			
gen	**dieses Guten**		**dieser Guten**	
dat	(diesem Guten)			(diesen Guten)

Thus, it seems clear that weak suffixes are both sensitive to morphosyntactic context, and contribute to the faithful expression of morphosyntactic properties of the NP, or at least the resolution of paradigmatic ambiguity. These observations are similar to those made by Durrell (1979), that "[…] the full morpho-syntactic characterization of a NP is given not by any one particular formative but by the particular combination of the formatives of all the members of a particular NP" (71). Similar observations are made by Zwicky (1986), and Spencer (2003). We also saw a comparable phenomenon in Icelandic. However, it remains unclear just what properties of the NP are relevant. How these facts can best be captured is the subject of the next section.

4.8.3. Features in the Weak paradigm.

We start with the observation that the strong/weak distinction, while perhaps descriptively useful, is not necessarily encoded in the grammar. That is, a single adjective paradigm is applicable to both adjective types. Recall from section 4.3.2 that weak suffixes appear on both attributive adjectives *and* on specifiers in the right contexts. In terms of assigning features to desinences, then, we need to recall that both suffix types (strong and weak) are in competition with each other, and

furthermore, both suffix types are compatible with both adjective types. The difference between the strong and weak adjective suffixes is quantitative rather than qualitative. We will show that weak suffixes are simply less marked (associated with fewer morphosyntactic features) than strong suffixes, and the peculiarities of their distribution can be largely attributed to this fact. However, there is no need to posit a lexical feature indicating suffix type (strong *vs*. weak).

Even though we have just denied any meaningful difference between strong and weak suffixes, we can still begin our discussion of features in the paradigm with the weak suffixes, since they are the most general in the paradigm. We make the important assumption that there are only two weak suffixes, despite the fact that neither suffix can be described in terms of a natural class. We suggest that the suffix /-e/, which appears in most singular non-oblique cells, bears the feature [-oblique] only. It doesn't surface on adjectives in non-oblique plurals and masculine accusative singular for reasons that we address in later sections. The other weak suffix, /-en/, is simply unspecified for any morphosyntactic features. It will surface in a given cell just in case no other suffix is compatible with a given syntactic environment, or in certain other situations that we will discuss shortly.

Table 4.6. Weak Suffix Specifications

	masculine	neuter	feminine	plural
nominative		*-e*		
accusative		[-oblique]		
genitive		*-en*		
dative		[ ]		

4.8.4. Features in the Strong Paradigm.

Table 4.7 lists all of the feature assignments for the German adjective paradigm. We discussed the distribution of features in the weak paradigm above. As in previous chapters, features are assigned according to contrastive specification. That is, features are posited either to keep a form out of some environments, or to make a form more specific to the environment(s) in which it occurs. In all cases, the features we propose reflect the distribution of these suffixes in syntactic contexts.

A few important observations about the distribution of features in this paradigm are in order. First, recall that gender is neutralized in the plural in German. We can take advantage of underspecification to account for this fact without positing any special filter. Instead, all that is necessary is to specify all gender-specific forms as concomitantly [-plural]. By this mechanism, gender-specific forms are straightforwardly barred from occurring in plural contexts.

Another crucial factor of our analysis is the distribution of the feature [oblique]. Note that all oblique suffixes are specified as [+oblique]. Only two non-oblique suffixes have a value for this feature: masculine accusative singular /-en/, and the weak /-e/ suffix. The presence or absence of this feature in morphosyntactic representations will prove to be the basis for a number of alternations. There are good reasons, however, for this distribution of features. Note that in nearly every instance nominative and accusative inflected forms are less specific than competing obliques. By specifying the oblique forms [+oblique] we effectively remove them from serious competition. Second, [oblique] is an important dividing line in this paradigm.

Syncretisms occur between nominative and accusative, between genitive and dative, and across gender lines. There are no syncretisms between oblique and non-oblique cases.

The two forms that are specified [-oblique] require some further discussion. First, the masculine accusative singular has to be [-oblique] because it is in competition with masculine dative and genitive forms. This is due to the fact that the feature [-nominative] (which is necessary to distinguish the masculine nominative and accusative forms) is also compatible with [-oblique]. To keep the accusative form out of dative environments it must, therefore, also be [-oblique]. The second [-oblique] form is the weak /-e/ suffix. We justified the choice of features for this form in section 5.8.3 above. Importantly, however, the fact that gender-specific forms are [-plural] means that the weak /-e/ form can participate in the strong paradigm in the non-oblique plural. There are two reasons for this. First, no other suffix is compatible with this environment. Second, the weak /-e/, since it lacks gender features, is morphosyntactically compatible with a head of any gender.

<table>
<tr><th></th><th colspan="4">FEATURES IN THE STRONG PARADIGM</th><th colspan="4">FEATURES IN THE WEAK PARADIGM</th></tr>
<tr><th></th><th>MASCULINE
[+masculine]
[-feminine]</th><th>NEUTER
[-masculine]
[-feminine]</th><th>FEMININE
[-masculine]
[+feminine]</th><th>PLURAL
[+plural]</th><th>MASCULINE
[+masculine]
[-feminine]</th><th>NEUTER
[-masculine]
[-feminine]</th><th>FEMININE
[-masculine]
[+feminine]</th><th>PLURAL
[+plural]</th></tr>
<tr><td>NOMINATIVE
[-oblique]
[+nominative]</td><td>-er
[+masc]
[+nom]
[-plu]</td><td rowspan="2">-es
[-fem]
[-plu]</td><td rowspan="2">-e
[+fem]
[-plu]</td><td rowspan="2">-e
[-obl]</td><td></td><td rowspan="3" colspan="3">-e
[-oblique]</td></tr>
<tr><td>ACCUSATIVE
[-oblique]
[-nominative]</td><td>-en
[+masc]
[-obl]
[-nom]
[-plu]</td><td></td></tr>
<tr><td>GENITIVE
[+oblique]
[+genitive]</td><td colspan="2">-es
[-fem]
[+obl]
[+gen]
[-plu]</td><td rowspan="2">-er
[+fem]
[+oblique]
[-plu]</td><td>-er
[+obl]
[+gen]</td><td colspan="4" rowspan="2">-en</td></tr>
<tr><td>DATIVE
[+oblique]
[-genitive]</td><td colspan="2">-em
[-fem]
[+obl]
[-plu]</td><td>-en
[+oblique]
[-gen]
[+plural]</td></tr>
</table>

Table 4.7. Feature Specifications in the German Adjective Paradigm.

Generalization 1: Attributive adjectives are *weak* if there is strong inflection elsewhere in the NP

Generalization 2: Attributive adjectives are strong if there is no strong inflection elsewhere in the NP

In the next sections we show how these specifications, together with the right set of constraints on association between syntactic and morphological representations, can yield pleasing results.

4.8.5. Morphological Blocking and German Concord.

Reliance on NO CLASH and AGREE alone fails to predict the German patterns of inflection correctly. Generally speaking, the weak suffixes are substantially underspecified with respect to competing strong suffixes, and, by hypothesis, should thus always be suppressed by the Blocking Convention. Recall from previous chapters that we modeled the Elsewhere Condition in terms of the two constraints in (46a-b), and their ranking in (46c). The constraint NO CLASH removes suffixes that are incompatible with the targeted syntactic context from competition, while the constraint AGREE promotes inflected forms with more agreeing features over those with fewer agreeing features. Together, these constraints have the effect of promoting the most specific compatible inflected form on every syntactic terminal node within the concord domain (the local NP).

(46) a. NO CLASH : A feature of an inflected form must correspond to an identical feature in the syntactic representation.

b. AGREE: A syntactic terminal node and its associated inflected form have identical features.

c. NO CLASH >> AGREE

The reason that these two constraints are insufficient to handle the German facts is illustrated in the tableau in (47). This partial tableau depicts the competition

between inflected forms for association with syntactic terminal nodes in a neuter nominative singular NP. As before, we assume that the agreement information (features for gender, case and number) is identical across terminal nodes of the NP. Agreement information is found in the box in the tableau normally reserved for the *input*. Also, although we assume a single AGREE constraint, as in chapter 3, we break the violations into two groups in the hopes of making the discussion easier to follow. Here, NO CLASH correctly rules out the majority of non-agreeing forms, however, AGREE incorrectly chooses candidate (47a) over the grammatical (47b) because the adjective in (47a) more closely matches the morphosyntactic features that describe the syntactic context.

(47)

	THIS, GOOD, BEER GEND: [-masculine] [-feminine] CASE: [-oblique] [+nominative] NUM: [-plural]	NO CLASH	AGREE det	 adj
☞a.	dieses gutes Bier [-fem] [-fem] [-pl] [-pl]		***	***
💣b.	dieses gute Bier [-fem] [-obl] [-pl]		***	***!*
c.	dieses guten Bier [+neut] [ ] [-pl]		***	***!**
d.	diesem gutes Bier [-fem] [-masc] [+obl] [-fem] [-plu] [-plu]	*! [obl]	**	**
e.	...	*!		

Comparing candidates (47a) and (47b), however, is instructive. As in Icelandic, combination of the strong and the weak forms in (46b) actually results in *more* morphosyntactic features being expressed in the context of the whole NP than the combination of two identical strong forms in (47a) does. In Icelandic the feature that resulted in the promotion of the weak suffix was [+definite]. In German, the feature is [-oblique]. Despite the fact that the features are different, the phenomenon appears to be the same, hence we adopt the same constraint for German that we used for Icelandic, repeated in (48). As with Icelandic, interleaving MAX-MS between NO CLASH and AGREE results in less specific compatible suffixes beating more specific compatible suffixes, just in case the less specific suffix yields an NP that expresses more morphosyntactic features on the whole.

(48) MAX-MS: Every morphosyntactic feature of X^{max} has a correspondent in a subordinate morphosyntactic representation.

This constraint simply looks for an instantiation of every input feature *somewhere* in the output candidates, it does not matter which word instantiates the feature, nor does it matter how many times the feature is instantiated, once is enough, but multiple occurrences do not occasion a violation of MAX-MS. MAX-MS is satisfied if every concord feature of the NP is expressed somewhere in the NP.

Let us see how this works in example (49). The candidates in this tableau are the same as in tableau (47), and they fare equally well with respect to the constraints NO CLASH and AGREE as they did in the previous example. However, by ranking MAX-

MS above AGREE, NPs that instantiate more features *in toto* win over candidate NPs which are locally more faithful to the input.

(49)

	THIS, GOOD, BEER GEND: [-masculine] [-feminine] CASE: [-oblique] [+nominative] NUM: [-plural]	NO CLASH	MAX-MS	AGREE det	AGREE adj
a.	dieses gutes Bier [-fem] [-fem] [-pl] [-pl]		***! [masc] [obl] [nom]	***	***
☞b.	dieses gute Bier [-fem] [-obl] [-pl]		** [masc] [nom]	***	****
c.	dieses guten Bier [-fem] [ ] [-pl]		***! [masc] [gov] [obl]	**	*****
d.	diesem gutes Bier [-fem] [-masc] [+obl] [-fem] [-plu] [-plu]	*! [obl]	* [nom]	***	**
e.	...	*!			

The constraints discussed so far are sufficient to account for the appearance of the weak suffix /-e/ when it contributes a feature towards the satisfaction of concord. However, these constraints do not explain the different grammaticality status of the phrases in (50). Recall from the discussion in section 4.5.2 and 4.5.3 that, like strong suffixes, weak suffixes can attach to both limiting and attributive adjectives. Since the lexicon is capable of producing both strong and weak variants of specifiers, both variants should be incorporated into the candidate set. However, the constraints, as they currently stand, make no mention of *where* in a Noun Phrase a given suffix

should occur. Since the two candidate NPs in (50) instantiate the same morphosyntactic feature set, they would tie with respect to the constraints so far developed.

(50) a. dies<u>es</u> gut*e* Bier
this.nt.sg. good.wk beer

b. * dies*e* gut<u>es</u> Bier
this.wk good.nt.sg beer
'this good beer'

The fact that these constraints cannot decide the relative order of inflected forms demonstrates their inadequacy to handle the German data, but there is another reason why the same constraints we used for Icelandic are insufficient to account for German. This is the topic of the next sub-section.

4.8.6. Weak suffixes in the oblique cases and the plural.

The constraint discussed in the previous section effectively promotes the appearance of weak morphology when doing so results in the expression of more morphosyntactic features in the whole NP. However, we suggest that the default weak suffix /-en/, which shows up in plural and oblique environments, is not associated with *any* gender, case, or number features. Clearly, if it is not associated with any features, the weak /-en/ suffix cannot contribute additional features to satisfy concord. Hence, an NP containing the weak /-en/ suffix cannot fare any better on MAX-MS than an NP containing a strong suffix. Where both candidates survive MAX-MS, we would expect

the AGREE to promote the more specific strong form. This situation is illustrated in (51). Here we see that since both candidate (51a) and candidate (51b) fare equally well on MAX-MS, the evaluation is passed on to AGREE. Since *gut<u>em</u>* instantiates more features than *guten*, AGREE incorrectly causes candidate (51a) to be selected as the winning candidate. Notice also that the problem discussed in the previous section persists here. Compare candidates (51b) and (51d). The candidates fare equally well on all constraints, because the order of inflected items is not evaluated. Were we able to suppress candidate (51a), we would still be faced with the problem of a tie on the next most optimal candidates.

(51)

	THIS, GOOD, BEER GEND: [-masculine] [-feminine] CASE: [+oblique] [-genitive] NUM: [-plural]	NO CLASH	MAX-MS	AGREE det	AGREE adj
☞a.	dies<u>em</u> gut<u>em</u> Bier [-fem] [-fem] [+obl] [+obl] [-plu] [-plu]		**	**	**
💣b.	dies<u>em</u> gut*en* Bier [-fem] [ ] [+obl] [-plu]		**	**	***!**
c.	dies<u>em</u> gut*e* Bier [-fem] [-obl] [+obl] [-plu]	*! [obl]	**	**	*****
d.	dies*en* gut<u>em</u> Bier [ ] [-fem] [+obl] [-plu]		**	**** *!	**
e.	...	*!			

Thus, it is clear that the proposals adopted for Swedish and Icelandic have to be modified in order to account for German. In particular, we need to answer the questions in (52) and (53).

(52) Why isn't the weak /-en/ suffix blocked from surfacing in all environments, given that strong suffixes are always more specific, and that the weak /-en/ suffix contributes nothing to the satisfaction of concord?

(53) Why don't weak suffixes appear on specifiers in Det, given that they are not morphologically prohibited from doing so?

4.8.7. How to solve these problems.

There are a few avenues within OT that we might follow to solve this problem. In Hughes (2000) we proposed a pair of constraints that targeted a feature [strong], but we have already argued against an approach that uses such an *ad hoc* morphological class feature.

A common device in OT is an *alignment constraint*. Such constraints dictate that some element of a structure align with an edge of some other structural unit. Thus, we might attempt to devise a constraint demanding that strong suffixes or morphosyntactic features align with the left edge of the NP. While such a constraint would have the effect of realizing highly specified suffixes preferentially on specifiers, when present, or on attributive adjectives when no determiner is present, it runs into three problems. First, nouns may have number suffixes in the plural; masculine and

neuter nouns bear a gender/case/number suffix in the non-feminine genitive singular, and most nouns bear a case suffix in the dative plural (in addition to regular plural marking on the noun). In the singular cases noun suffixes appear even when there is a morphologically suitable host (a specifier or attributive adjective) on the left edge of the NP. An alignment constraint would tend to suppress noun suffixes in these situations. Second, attributive adjectives may still be inflected (with weak suffixes) even when the strong suffix occurs leftmost in the NP, again in apparent violation of a left-edge alignment constraint. Finally, all attributive adjectives that modify the same head noun are identically inflected. Alignment might require that only the leftmost adjective in a series be inflected. These considerations make an account based on alignment difficult, at best, to formulate.

There is another possibility that will allow us to solve the problems highlighted in the previous section. We propose a *markedness constraint* on morphological representations called *STRUC/ADJP, defined in (54). This constraint assigns a violation mark for each morphosyntactic feature associated with a morphological representation in a syntactic structure.[10] In other words, the constraint suppresses more marked forms in favor of less marked forms, where morphosyntactic markedness is defined quite literally, in terms of the number of features associated with a given item.

(54) *STRUC/ADJP: avoid the expression of morphosyntactic features in AdjP

[10] That is, the constraint evaluates morphological representations that are candiates for association with terminal nodes of syntactic structures; it is a constraint on lexical items in context, but not a constraint on word formation. In otherwords, this constraint does not prevent inflected attributive adjectives from constituting part of the output of the lexicon.

The constraint in (54) demands that, all else being equal, the least marked adjective suffix be chosen in AdjP. The AdjP precedes the head noun, and follows the determiner slot. The adjective phrase corresponds to the second inflection zone discussed in section 4.3.3 above. Recall that the determiner slot may contain at most one item. Therefore, all attributive adjectives, and any specifiers after the first occur in the AdjP.

By adopting the constraint ranking in (55), we achieve the desired effects of promoting strong affixes on determiners (and nouns, where morphologically possible), and of allowing unmarked suffixes to surface even when more specific compatible forms exist.

(55) NO CLASH >> MAX-MS >> *STRUC/ADJP >> AGREE

In the next section we show how the constraints and their ranking in (55), in conjunction with the morphosyntactic specifications for the paradigms in Table 4.7, yield appropriate results for German, and provide possible explanations for a number of facts about German NP inflection.

4.8.8. Why specifiers are usually strong.

Recall from earlier discussion that one reason the Icelandic solution was deemed inadequate for German is that the constraints could not decide between two candidates that contained the same suffixes but in different locations within the NP. That is, both the specifier and the attributive adjective can take weak inflection.

However, since weak suffixes have fewer morphosyntactic features than strong suffixes, they are appear preferentially in the Adjective phrase as a result of the constraint *STRUC/ADJP. Tableau (56) shows how this constraint addresses this issue. Compare the candidates (56b) and (56c). These candidates fare equally well on all other constraints. However, candidate (56b) better conforms to *STRUC/ADJP by virtue of having a less morphosyntactically marked item in AdjP. Note that the constraint MAX-MS crucially outranks *STRUC/ADJP or candidate (56d) would be the winner. (56d) contains the maximally unmarked suffix/-en/, but since (56c) supplies a morphosyntactic feature not associated with the strong suffix, it better comports with MAX-MS, and hence emerges victorious.

(56)

	THIS, GOOD, BEER GEND: [-masculine] [-feminine] CASE: [-oblique] [+nominative] NUM: [-plural]	NO CLASH	MAX-MS	*STRUC/ ADJP	AGREE det	AGREE adj
a.	dieses gutes Bier [-fem] [-fem] [-pl] [-pl]		***! [obl] [nom] [masc]	**	**	**
☞b.	dieses gute Bier [-fem] [-obl] [-pl]		** [nom] [masc]	*	**	****
c.	diese gutes Bier [-obl] [-fem] [-pl]		** [nom] [masc]	**!*	****	**
d.	dieses guten Bier [+neut] [ ] [-pl]		***! [obl] [nom] [masc]		**	*****
e.	diesem gutes Bier [-fem] [-fem] [+obl] [-plu] [-plu]	*! [obl]	* [nom]	***	***	***
f.	...	*!				

4.8.9. Why does the unmarked affix surface at all?

As we saw in the previous sub-section, ranking *STRUC/ADJP below MAX-MS means that marked suffixes can still surface in AdjP, just in case they contribute to concord. However, when concord can be best satisfied *elsewhere* in the NP (either on the specifier or on the noun), *STRUC/ADJP promotes the unmarked suffix on the Adj node. We show how this works for a neuter dative singular NP in (57). Candidates (57a & b) are the most interesting candidates here. Both fare equally well on MAX-MS, since both candidates express the same number of distinct morphosyntactic features

(the only features expressed in these two candidates are [-fem] [+obl], and [-pl]). Since they are tied here, the decision is passed to the next lower constraint. The strong adjective in (57a) violates *STRUC/ADJP three times, once for each feature associated with the inflected form. Since (57b) does not violate the constraint at all, it is the winning candidate. Also, example (57d) shows once more how *STRUC/ADJP promotes the appearance of strong morphology on specifiers in Det. Again, this candidate fares equally well as the winning candidate on MAX-MS. However, candidate (57d) fatally violates *STRUC/ADJP by virtue of the fact that the attributive adjective is associated with morphosyntactic features.

(57)

	THIS, GOOD, BEER GEND: [-masculine] [-feminine] CASE: [+oblique] [-genitive] NUM: [-plural]	NO CLASH	MAX-MS	*STRUC ADJP	AGREE det	AGREE adj
a.	dies<u>em</u> gut<u>em</u> Bier [-fem] [-fem] [+obl] [+obl] [-pl] [-pl]		**	*!**	**	**
☞b.	dies<u>em</u> gut*en* Bier [-fem] [ ] [+obl] [-pl]		**		**	*** **
c.	dies<u>em</u> gut*e* Bier [-fem] [-obl] [+obl]	*! [obl]	***		***	*** **
d	dies*en* gut<u>em</u> Bier [ ] [+masc] [+obl] [-pl]		**	*!**	*** **	***
e.	dies<u>em</u> gut<u>es</u> Bier [-fem] [-fem] [+obl] [-pl] [-pl]		**	**!	*** *	*** **
f.	...	*!				

Before considering other properties of the German adjective alternation that this system explains, let us summarize what we have done so far. We argued that the Blocking Convention was insufficient for regulating concord in German because less specific morphological forms routinely surface in German, blocking more specific forms. Furthermore, as in Icelandic, the Elsewhere Condition as traditionally formulated can not apply because the features expressed by the weak /-e/ suffix are not a subset of the features expressed by the compatible strong forms (though NO CLASH ensures that all attested forms express a subset of the features required by the syntax).

We showed that purely syntactic solutions are unable to account for all of the facts because the same word type, and sometimes the same word, behaves differently in different morphological contexts, even though the syntactic structure remains unaltered. It was also pointed out in this light that even an analysis that advocates full specification of inflected forms is doomed to failure, since more marked and less marked items may appear in identical morphosyntactic environments (described in terms of features, thus, strong *dies**es*** appears alongside the less specific weak *gut**e*** in *dieses gute Bier*). In reevaluating the German facts, we showed that weak suffixes are not inert, but can contribute to satisfying concord by supplying the feature [-oblique]. In order to allow this to happen, we expanded the domain of concord to include the whole NP *via* the constraint MAX-MS. However, this was only appropriate for non-oblique singular cells. In the rest of the cells the least specific suffix often blocks more specific exponents despite the fact that it does not have any concord features. Furthermore, these constraints could not account for the relative order of strong and weak suffixes. The introduction of an economy constraint on the expression of morphosyntactic features in AdjP solved two important problems. First, the constraint accounts for why weak suffixes appear on attributive adjectives rather than specifiers, in the main, despite specifiers' morphological compatibility with weak suffixes. Second, the economy constraint, due to its interaction with MAX-MS, also accounts for how an unmarked suffix can survive competition against a compatible but more marked form.

Another factor that we have not highlighted, but which ultimately makes the whole system possible, is the fact that the German lexicon is able to make all of these forms available. This may seem like a trivial point, at first, but one imagines that this sort of system is rare, at least in part, because a language has to have these 'extra' compatible suffixes available in the first place.

4.9. Desiderata revisited.

Now that we have the basic outline of the proposal, let's return to the desiderata for an adequate account of this phenomenon that we laid out in section 4.8. These points are repeated here as (58). We take up the first three points in this section, and show in subsequent sections how our account is able to handle a number of subtle alternations that remain a mystery under previous accounts.

(58) a. Avoid positing any *ad hoc* declension feature.

b. Avoid the introduction of new syntactic principles.

c. Provide a relatively streamlined set of word formation rules.

d. Explain anomalies of the German NP paradigm.

4.9.1. No Declension feature.

We have shown that it is possible to devise an account of German adjective alternations that doesn't rely on a specific declensional feature. All of the features proposed in our account are features for gender, case, or number properties of German NPs. This analysis does not recognize any formal difference between strong and weak

suffixes. In fact, we argue that the 'weak' /-e/ suffix is the same as the 'strong' plural suffix. Under our analysis there is a single NP paradigm containing suffixes that can attach to specifiers, attributive adjectives, and in the case of the non-feminine genitive singular and the dative plural, nouns. The weak suffixes show up in highly restricted environments mostly due to the fact that they are simply massively underspecified forms, which generally lose in competition to more specific forms in any endeavor to be the primary gender/case/number exponent.

4.9.2. No new syntactic principles.

In our analysis of Germanic concord we have posited no new syntactic devices. All of the constraints are on the morphological expression of syntactic terminal nodes. Importantly, this means that concord within the syntactic domain can still be described in universal terms. Generally speaking, concord (and agreement) is simply the distribution of an identical set of agreement features to all relevant nodes in some domain. We posit no syntactic mechanism for German that is not also relevant for, say, Spanish. What is language-specific about concord and agreement has to do first with what features are in use in a given language, and second with the inventory of concord/agreement forms. In other words, we claim that any language that has, e.g. case features, will require that those features be distributed in equal measure across the NP. However, it is a parochial fact about German that it has, say, *dative* case, and simply a property of the lexicon that there is no way to distinguish between masculine and neuter in this case. The constraints we have argued for regulate how terminal

nodes are interpreted, but do not affect how concord or agreement proceed in the syntactic component. Of these constraints, two model morphological blocking, for which there is abundant independent evidence. The constraint MAX-MS is relevant for both German and Icelandic and encodes a relatively straightforward insight: that some weak suffixes contribute unique features towards the satisfaction of concord.

Only one constraint, *STRUC/ADJP, is specific to German. This constraint has *no syntactic effects*. That is, it has no effect on the distribution of features across nodes in the syntactic structure, it only regulates which of those features are likely to receive surface morphological expression. Markedness constraints are fixtures in the OT literature, and should not be seen as a radical step along the lines of positing new syntactic devices. Furthermore, it is simple in its conception and effect, and goes a long way towards answering some basic questions about inflection patterns in German.

4.9.3. Fewer Word Formation Rules.

Our word formation component was laid out explicitly in table 4.7. We require only 11 rules to describe the entire set of strong and weak suffixes. Most importantly, there is no redundancy in the rule set occasioned by the need for a declensional feature. Nor are there any suffixes that are homophonous and identical in morphosyntactic features but for a feature like [strong]. Additional economy is gained through the application of contrastive specification. The latter allows us, for instance, to posit a single weak suffix /-en/, despite the fact that the contexts in which this suffix

occurs do not constitute a natural class. On this score this proposal must be seen as superior to previous accounts.

4.10. Explaining the anomalies.

In addition to the theoretical advantages outlined in the previous section, the system we have developed here also has the practical advantage of explaining three other odd facts about the German adjective paradigm that remain unaccounted for in other accounts. We address each of these in turn.

4.10.1. Why are attributive adjectives always weak in the Non-feminine Genitive Singular?

We noted earlier that the non-feminine genitive singular represents an apparent irregularity in the adjective paradigm, insofar as attributive adjectives are always weak in this environment. However, this is also the only place in the paradigm where nouns are themselves inflected for case. An example is provided in (59). Note, as we see in (60), there is no *phonological* reason why /-es/ couldn't surface in non-feminine genitive singular contexts, since the same phonological form surfaces elsewhere in the paradigm.

(59) statt (dieses) gut*en* Bieres. *neuter genitive singular*
'instead of (this) good beer'

(60) ohne gutes Bier *neuter masc/acc singular*
without good beer

Under the system proposed here, this 'irregularity' is predicted. The tableau depicting the competition in a bare non-feminine genitive NP is provided in (61). Note that MAX-MS is best satisfied so long as there is at least one strong suffix within the NP, but candidates with more strong suffixes in the NP will not instantiate any additional compatible features, and so cannot better satisfy MAX-MS. The most harmonic locus for the strong ending then, is on the noun. Since the noun itself satisfies MAX-MS, a strong ending on the adjective would run afoul of the constraint *STRUC/ADJP. We can see that (61b) beats (61a) because it does not violate *STRUC/ADJP.

(61)

	GOOD, BEER GEND: [-masculine] [-feminine] CASE: [+oblique] [+genitive] NUM: [-plural]	NO CLASH	MAX-MS	*STRUC ADJP	AGREE det	AGREE adj
a.	gutes Bieres [-fem] [-fem] [+obl] [+obl] [+gen] [+gen] [-plu] [-plu]		*	*!***		*
☞b.	gut*en* Bieres [-fem] [+obl] [+gen] [-plu]		*			*** **
c.	gut*en* Bier [ ] [ ]		**!***			*** **
d.	gutes Bier [-fem] [+obl] [+gen] [-plu]		*	*!***		*
e.	...	*!				

Singular non-feminine genitive NPs also show that AGREE is still necessarily active in German. Consider the tableau in (62), detailing the evaluation of a neuter genitive singular NP. We noted above that MAX-MS can be satisfied by a single occurrence of a strong suffix within the NP, so one might wonder, given that specifiers are capable of being weakly inflected, why they show up as strong forms in these NP types (e.g. why do we find *dieses* and not *diesen* in this context?). By the same token, MAX-MS could be satisfied by a single occurrence of the strong affix on the determiner, and the noun could be uninflected. Compare (62c-d) in this regard. Even though a single occurrence of the strong suffix sufficiently satisfies MAX-MS, since the noun and the specifier vacuously satisfy *STRUC/ADJP, AGREE still requires maximum identity between a terminal node and the morphological node it is in association with, unless a higher ranked constraint prevents it. Therefore, *dieses* surfaces in lieu of *diesen* because it better agrees with the terminal node with which it is associated; there is nothing to force the appearance of the less faithful weak suffix.

(62)

	THIS, GOOD, BEER GEND: [-masculine] [-feminine] CASE: [+oblique] [+genitive] NUM: [-plural]	NO CLASH	MAX-MS	*STRUC ADJP	AGREE det	AGREE adj/N
a.	dieses gutes Bieres [-fem] [-fem] [-fem] [+obl] [+obl] [+obl] [+gen] [+gen] [+gen] [-plu] [-plu] [-plu]		*	*!***	*	*
☞b.	dieses gut*en* Bieres [-fem] [ ] [-fem] [+obl] [+obl] [+gen] [+gen] [-plu] [-plu]		*		*	*** **
c.	dies*en* gut*en* Bieres [ ] [ ] [+masc] [+neut] [+gov] [-pl]		*		*** **	**! ***
d.	dieses guten Bier [-fem] [ ] [+obl] [+gen] [-plu]		*			*! (10)
e.	dies*en* gutes Bieres [ ] [-fem] [-fem] [+obl] [+obl] [+gen] [+gen] [-plu] [-plu]		*	*!***	*** **	*
f.	dies*en* gut*en* Bier [ ] [ ]		**!***		*** **	* (10)
g.	...	*!				

4.10.2. Why do we get the weak /-en/ suffix on adjectives in the Masculine Accusative Singular?

The only singular non-oblique instance of the weak /-en/ suffix comes in the masculine accusative singular. Interestingly, with respect to the German paradigm,

Masculine is the most marked gender (insofar as it has the most desinences, which in turn require a greater number of morphosyntactic features to describe, since their domains of application are the narrowest). Also, the masculine accusative is the most marked non-oblique cell (see discussion in section 4.7.4.). The default suffix (/-en/) occurs because the masculine accusative singular desinence has to have the feature [-oblique] (see section 4.8.4). That is, since the attribute [-oblique] can be instantiated outside of AP, the feature [-oblique] associated with the weak /-e/ suffix fails to help satisfy MAX-MS, and is therefore suppressed by *STRUC/ADJP in favor of the more economical unmarked /-en/ suffix. This competition is shown in (63):

(63)

	THIS, GOOD, WINE GEND: [+masculine] [-feminine] CASE: [-oblique] [-nominative] NUM: [+plural]	NO CLASH	MAX-MS	*STRUC ADJP	AGREE det	AGREE adj
a.	dies<u>en</u> gut<u>en</u> Wein [+masc] [+masc] [-obl] [-obl] [-nom] [-nom] [-plu] [-plu]		*	*!***	*	*
☞b.	dies<u>en</u> gut*en* Bier [+masc] [ ] [-obl] [-nom] [-plu]		*		*	*** **
c.	dies<u>en</u> gut*e* Bier [+masc] [-obl] [-obl] [-nom] [-plu]		*	*!	*	*** *
d	dies*en* gut<u>en</u> Bier [ ] [+masc] [-obl] [-nom] [-plu]		*	*!***	*** **	*
e.	dies*e* gut<u>en</u> Bier [-obl] [+masc] [-obl] [-nom] [-plu]		*	*!***	*** *	*
f.	...	*!				

4.10.3. Why is the weak form for feminine non-oblique singular /-e/, but the weak form for non-oblique plurals /-en/ despite the fact that the affixes on the specifiers seem to be the same? (or: do plurals really neutralize to feminine gender?)

Recall that German neutralizes gender distinctions in the plural. The strong adjective forms of the non-oblique feminine singular and the non-oblique plural are phonologically identical. However, as we see in (64), the feminine singular conditions the weak /-e/ suffix, while the plural conditions the weak /-en/ suffix. This suggests that while the feminine and plural forms are homophonous, they are not, in fact, syncretic. That is, the same phonological material is associated with different morphosyntactic features in these cells. We assume that while the German lexicon does produce a unique feminine form, there is no uniquely plural form of adjectives. Instead, the plural cell is filled with the weak /-e/ suffix, yielding the lexical specifications in (65).

(64) a. meine gute Uhr
my good watch

b. meine guten Uhren
my good watches

(65) a. meine (*fem.sg*)
[+fem]
[-pl]

b. meine (*pl*)
[-obl]

These lexical representations straightforwardly capture the homophony between feminine and plural, without requiring syncretism. As shown in (66), the only compatible adjective form for plural is the weak /-e/, which shows up on the specifier. Since repetition of /-e/ on the attributive adjective would be redundant, that candidate is suppressed by *STRUC/ADJP. The [-plural] specification of the feminine singular form is incompatible with the syntactic context, and ruled out by NO CLASH.

(66)

	1SG.POSS, GOOD, WATCH GEND: [-masculine] [+feminine] CASE: [-oblique] [+nominative] NUM: [+plural]	NO CLASH	MAX-MS	*STRUC ADJP	AGREE det	AGREE adj
☞a.	mein*e* gut*en* Uhren [-obl] [ ] [+pl]		***		****	**** *
b.	mein*e* gut*e* Uhren [-obl] [-obl] [+pl]		***	*!	****	****
c.	mein<u>e</u> gut*e* Uhren [+fem][-obl] [+pl] [-plu]	*!	**	*	**	**
d.	mein<u>e</u> gut*en* Uhren [+fem] [+pl] [-plu]	*!	***		**	***
d.	...	*!				

4.10.4. Summary.

We have looked at three places in the German NP paradigm where the attested form is not what might have been predicted. Other approaches have either not addressed these issues, or resolved them via stipulation or extra word formation rules. Under the approach we advocate, the anomalies in the German paradigm are easily explained without any additional apparatus.

4.11. A final problem.

There is one issue that remains to be addressed. All adjectives in AP are, where morphologically possible,[11] identically inflected. Examples are shown in (67-68). Note, in particular, the ungrammatical example (68b). One might expect that this example would be optimal, given that, by the logic used above, it expresses more features than its competitor (68a).

(67) dies**er** gut*e* alt*e* Wein

this.masc.nom.sg good.wk old.wk wine

'this good, old wine'.

(68) a. gut**er** alt**er** Wein.

good.masc.nom.sg old.masc.nom.sg wine

b. *gut**er** alt*e* Wein

good.masc.nom.sg. old.wk wine

'good, old wine'

We have no particularly good solution to this problem. However it is possible to devise a constraint that yields the desired effect of suppressing NPs in which attributive adjectives are not identically inflected. We'll call this constraint, defined in (69), CATEGORIAL IDENTITY (CATIDENT).

(69) CATIDENT: All lexical items in an NP dominated by the same local syntactic category have identical inflection.

[11] There is a small group of attributive adjectives that are never inflected, these include *prima* 'cool', and *lila* 'purple'. This is a morphological fact about certain adjectives that has no significant bearing on any of the proposals discussed in this chapter.

If we assume that a single specifier can appear under Det, and that all other adjectival modifiers appear under an Adj node, then this constraint will do the trick. By ranking the constraint in (69) over MAX-MS we derive the desired effect, as shown in (70). All three candidates (70b-d) fare better than the winning candidate on MAX-MS. However, this is irrelevant, since they also all violate the higher ranked CATIDENT.

(70)

	THIS, GOOD, BEER GEND: [+masculine] [-feminine] CASE: [-oblique] [+nominative] NUM: [-plural]	NO CLASH	CAT-IDENT	MAX-MS	*STRUC ADJP	AGREE det	AGREE adj
☞a.	guter alter Wein [+masc] [+masc] [+nom] [+nom] [-pl] [-pl]			**	***	**	**
b.	guter alte Wein [+masc] [-obl] [+nom] [-pl]		*!	*		**	*** **
c.	gute alter Wein [-obl] [+masc] [+nom] [-pl]		*!	*	***	** **	**
d.	guter alten Wein [+masc] [ ] [+nom] [-pl]		*!	**		** **	*** **
e	gute alte Wein [-obl] [-obl]			***!*	*	** **	*** *
f.	*all else*	*!					

4.12. Conclusions.

German adjective inflection is problematic for any theory of the morphology-syntax interface that relies on some version of morphological blocking, since apparently less-specific suffixes routinely surface in lieu of more specific suffixes, contrary to predictions. Insofar as weak and strong suffixes can surface in identical morphosyntactic environments, a theory of the interface that relies on full lexical specification of morphosyntactic properties also faces significant problems accounting for the German facts. Building on our analyses of Swedish and Icelandic, we have shown that an association model of the morphology-syntax interface, coupled with a paradigmatic approach to morphological analysis that utilizes underspecification can adequately and straightforwardly describe most aspects of this phenomenon. In addition, when compared to approaches that attempt to resolve the problem in the syntactic component alone, the association approach has important advantages. In particular, there is no need to tinker with syntactic concord, none of the constraints adduced here has any effect on the syntactic representation (just on its morphological realization). No new syntactic devices are introduced. Concord, and by extension, agreement, can still receive universal treatment in the syntactic component (i.e. terminal nodes of the NP must be identical for concord features). German differs from other languages not in terms of how syntactic concord is effected, but by having multiple morphological options for expressing morphosyntactic distinctions.

Furthermore, this approach yields a more economical word formation component of the grammar. This results partly from the fact that there is no need for

ad hoc inflectional features like [DECLENSION] and the redundancies that such a feature introduces. All features used in this approach are based in the morphosyntax of the languages under examination. The traditional distinction between strong and weak paradigms was shown to be unnecessary.

Chapter 5

Conclusion

5.1. Overview.

In this chapter we review the results from the case studies presented over the course of this dissertation. In addition, we point out a number of smaller points and generalizations that emerge from consideration of all of these studies together. Next, we take a final look at how morphological blocking effects are modeled in morphological theory. Finally, we take a closer look at connections between several ideas promoted in this thesis and Optimality Theory. In particular, we discuss the relations between faithfulness in morphosyntax and faithfulness in OT in general. It is observed that, as elsewhere in OT, completely faithful expression of linguistic categories is by no means the only option for inflectional systems.

5.2. Summary of results from previous chapters.

In this section we review the principal results from each of the case studies in this thesis.

5.2.1. Swedish.

In chapter 2 we argued that morphosyntactic properties of inflected forms are best characterized in terms of potentially underspecified bundles of morphosyntactic features. We showed that the full-specification alternative leads to a more complex

and more redundant grammar than one based on underspecification. This is because full specification requires a unique morphosyntactic representation for every syntactic context. We showed that despite being simpler in its morphological analyses, underspecification required a slightly more complex morphology-syntax interface. In order to be able to select the right inflected form from the lexicon, the grammar needs to first eliminate any clashing forms from consideration, and then it has to select the form that most closely matches the relevant syntactic context from the remaining (non-clashing) forms.

We showed that Elsewhere Condition effects could be captured in this model by two appropriately ranked constraints. We called the top ranked constraint NO CLASH, and the second constraint AGREE. NO CLASH is violated for any lexical morphosyntactic feature that has no corresponding feature in the syntax, or whose syntactic correspondent has a different feature value. AGREE is violated for every featural difference between syntactic and morphological representations. These constraints work together to select the most faithful morphological expression of the morphosyntactic features in the associated syntactic representation.

(1) *Constraint Ranking for Swedish:*

NO CLASH >> AGREE

For languages like Swedish, where only these two constraints are relevant for evaluating morphological expression of morphosyntactic features, completely faithful morphological expression is limited only by the lexical resources of the language. Thus, Swedish has only three inflected forms to match eight possible syntactic

contexts (different combinations of gender, case, and definiteness features). In the majority of these contexts, however, the form selected was the least specific form in the paradigm. While the *a*-form is nearly always less than perfectly faithful, it can surface in multiple contexts due to the morphosyntactic incompatibility of competing forms with the targeted syntactic context.

In addition, we demonstrated that definiteness in Swedish is a concord property on a par with gender and number. The appearance of different adjective forms in Swedish NPs can be attributed entirely to concord properties of the containing NP. There is no need to attribute the adjective alternations to particular properties of any determiner with which the attributive adjective is in construction. There was no need to posit any special syntactic device, or any *ad hoc* morphological feature (such as [+/-strong]) to account for the distribution of adjective suffixes. We later saw that the same arguments for including definiteness as a concord category applied to Icelandic as well.

In sum, we argued in chapter 2 that morphosyntactic representations are best described in terms of underspecification. Underspecification required a conception of the morphology-syntax interface that produces morphological blocking effects. These effects could be reproduced by the NCA Blocking Convention, defined in terms of two ranked constraints on faithful morphological expression of syntactic features.

5.2.2. Icelandic.

The Icelandic adjective paradigm can be described as containing two types of suffixes: strong and weak. We saw that strong suffixes surface in both definite NPs (on specifiers), and indefinite NPs (on specifiers and attributive adjectives). Weak suffixes, on the other hand, surface only on attributive adjectives in definite NPs.

We showed that suffixes in the weak paradigm are typically less specific than suffixes in the strong paradigm. That is, for any licit combination of syntactic concord features, compatible strong suffixes tend to express a greater subset of the features than compatible weak suffixes. This fact is problematic for any approach to the morphology-syntax interface predicated on the NCA Blocking Convention because less-specific weak suffixes surface in lieu of more specific strong suffixes in a number of contexts. Furthermore, a version of Morphological Blocking based on the Elsewhere Condition can not, strictly speaking, apply in several instances, since the features expressed by weak suffixes do not always constitute a subset of the features expressed by competing strong suffixes.

We observed that weak suffixes, despite being less specific, express a morphosyntactic property that strong suffixes don't express: [+definite]. As a result, the combination of a weak and a strong suffix in the same definite NP caused more distinct morphosyntactic features to be expressed in the NP than either two strong suffixes or two weak suffixes could.

In order to capture the generalization that Icelandic prefers NPs that express a larger number of distinct morphosyntactic features, we argued that Icelandic required

an additional constraint, which we called MAXIMIZE MORPHOSYNTAX (MAX-MS). MAX-MS is violated for every concord feature of the NP that is not morphologically instantiated in at least one of the NP's sub-constituents. By ranking this constraint between NO CLASH and AGREE we were able to account for the strong-weak adjective alternation in Icelandic.

(2) *Constraint Ranking for Icelandic.*

NO CLASH >> MAX-MS >> AGREE

MAX-MS has the effect of subverting 'local' faithfulness to features of individual terminal nodes in favor of 'global' faithfulness to features of the whole NP. That is, AGREE favors the inflected form which most faithfully expresses the morphosyntactic features of the terminal node with which it is associated. MAX-MS, on the other hand, favors NPs in which the greatest number of distinct features are expressed, allowing individual forms to express fewer features. In other words, in Icelandic the domain of morphosyntactic faithfulness is not just the terminal node, but the whole NP.

5.2.3. German.

Definiteness is not a concord feature in German. Nonetheless, German also has strong and weak concord suffixes. We saw that the German data presents the same basic problem for the Blocking Convention and the Elsewhere Condition: less specific weak suffixes regularly supplant more specific, compatible strong suffixes under some conditions.

German has two weak suffixes. One of them, /-e/, acts like Icelandic weak suffixes, and surfaces because it can help satisfy MAX-MS in many contexts. In other words, this suffix contributes a feature towards satisfying morphosyntactic faithfulness with respect to the whole NP. Unlike Icelandic, though, the 'extra' feature contributed by the weak suffix is a case feature ([-oblique]) rather than a feature for definiteness.

However, we also saw that the other weak suffix, /-en/, is not specified for any concord features. This is a problem because an unspecified form can never contribute any features toward the satisfaction of any faithfulness relation (though they never violate NO CLASH). Furthermore, there are always more faithful forms available for any syntactic context in which weak /-en/ surfaces. That is, due to its lack of features, the unspecified suffix will always violate AGREE the maximum number of times, and can not help satisfy MAX-MS. Since forms which better satisfy AGREE are always available, we have to explain how it is possible for an unmarked form to surface in German. In order to deal with this problem we proposed a constraint on the expression of morphosyntactic features to address this problem. More specifically, we proposed the constraint AVOID MORPHOSYNTACTIC STRUCTURE IN THE ADJECTIVE PHRASE (*STRUC/AP). The constraint *STRUC/AP is violated for every feature expressed by an adjective under AP. Because *STRUC/AP is ranked below MAX-MS it does not uniformly suppress the appearance of features in AP, but only when global faithfulness (i.e. the higher ranked MAX-MS) can be satisfied by a co-occurring specifier or by the head noun.

(3) *Constraint Ranking for German:*

NO CLASH >> MAX-MS >> *STRUC/AP >> AGREE

The constraint *STRUC/AP has two main effects for German, and two subsidiary effects. First, as noted above, it allows the unmarked /-en/ suffix to surface just in case MAX-MS can be satisfied outside of AP. Second, the constraint ensures that morphosyntactic information is preferentially expressed under the Det or N nodes (or both), mimicking, in some respects, an alignment constraint but without the attendant problems. Related to this second point are two subsidiary points. First, *STRUC/AP explains the order of suffixes in the NP. Despite the fact that specifiers and attributive adjectives alike are compatible with either strong or weak morphology, when both items are inflected, weak morphology surfaces on the attributive adjective. The opposite arrangement (weak morphology on the determiner, strong on the adjective) is less optimal because it would mean that more features are expressed in AP. And second, MAX-MS explains why attributive adjectives are always weakly inflected in non-feminine genitive singular contexts, even when no specifier is present. Attributive adjectives are weak in these contexts because MAX-MS can be satisfied by the noun suffix. Since MAX-MS is satisfied outside of AP, *STRUC/AP prevents features from being expressed on attributive adjectives.

5.3. General Observations.

In the previous subsections we discussed a number of results that were reached in regard to specific languages. In this section we will comment on a number of smaller points about this approach to concord in general.

5.3.1. Features.

One advantage of this approach is that all of the features we have posited in this thesis are morphosyntactic features (feature for case, gender, number, or definiteness). The features posited for each analysis are motivated by properties of specific suffixes, the paradigms in which they take part, and the syntactic contexts in which the suffixes appear. We haven't posited any features not linked to demonstrable morphosyntactic distinctions made in the language in question.

The terms *strong* and *weak*, as used in this thesis, are entirely descriptive; they play no role in selecting the proper form. In fact, beyond allowing suffixes to differ with respect to the number and names of morphosyntactic features they express, we haven't posited any difference between the strong and weak adjective paradigms of the languages in question. Thus, all of the alternations and patterns of inflection in all three languages are attributed to the interaction of constraints on the expression of morphosyntactic properties, and the interaction of these constraints with the content of the lexicon.

5.3.2. Constraints.

The morphosyntactic faithfulness constraints that we have proposed in this thesis are quite general in their application. That is, the constraints range over all terminal nodes and all morphosyntactic features. No faithfulness constraint is keyed to particular features, word classes, or terminal nodes. The same constraints that enforce faithfulness between the Det node and its associated lexical form enforce faithfulness of adjectives and nouns to their associated syntactic nodes. By the same token, all morphosyntactic features are treated alike by the constraints. Faithfulness to case features, for instance, is equally important as faithfulness to other concord features. This is significant since it reduces the number of possible constraints. A lower number of constraints means that there are fewer permutations of constraint rankings, and hence fewer possible distinct grammars. Furthermore, the generality of these constraints means that, although not active in every language, the same constraints can apply in different languages, despite the fact that the languages may differ in terms of the number and categories of concord features, and their distribution in the lexicon.

5.3.3. Syntax.

Another important advantage of the approach to the morphology-syntax interface that we are advocating is that it allows a universal characterization of syntactic concord: all terminal nodes dominating a noun and its modifiers have to be identical with respect to concord features. Of course, which features count as concord

features, and the order of sub-constituents in the NP are language-particular concerns. The constraints that we have proposed in this thesis have no syntactic effects. Manipulation of features in syntactic structures is a matter for syntactic constraints. All that our constraints do is regulate how features of syntactic representations are expressed morphologically.

5.3.4. Affixation and morphological expression.

In the languages we have looked at, there is no necessary connection between morphosyntactic features associated with a word form and the presence of affixal morphology. In Swedish, for example, the common gender singular form *stor* 'big' expresses the morphosyntactic properties of number and indefiniteness, despite lacking an overt affix. On the other hand, we saw the converse in both Swedish and German. These languages have overt affixes that are unassociated with any morphosyntactic features (Swedish *stora* 'big', and German *guten* 'good'). Interestingly, despite the fact that these forms are themselves morphosyntactically meaningless, we saw that they can play an important role in identifying morphosyntactic properties of other items in the NP, and resolve ambiguities created by homophony in paradigms.

5.4. Elsewhere Condition Effects.

The Elsewhere Condition (a.k.a. *morphological blocking*) has a venerable history in linguistic theory, both in phonology and morphology (cf. Chapter 2 § 10).

We showed that Elsewhere condition effects in the syntax-morphology interface could be achieved through the specific ranking of constraints on morphosyntactic faithfulness repeated in (4), if, as in Swedish, the available suffixes stand in a subset-superset relationship. The constraints we adopted, however, can also apply in situations where the competing forms do not stand in such a relation. Hence, we renamed the phenomenon the NCA Blocking Convention.

(4) *The NCA Blocking Convention.*

NO CLASH >> AGREE

However, we have shown that the data presented in chapters 3 and 4 cannot be accounted for either by means of the traditional Elsewhere Condition nor by the Blocking Convention alone. The fact that morphological blocking has to be modeled in terms of two separate constraints, however, presented an opportunity to account for this problematic data. Since two constraints are needed, it is possible that other constraints can intervene between them. With additional constraints interjected, morphological blocking effects are masked, and a significant amount of otherwise tricky data can be accounted for.

Furthermore, describing morphological blocking in the terms in (4) is exceedingly simple. The most commonly cited definition of morphological blocking, in contrast, is quite complex. Here is Andrews' Morphological blocking principle (1990: 519).

(5) Morphological Blocking Principle:

> Suppose the structure *S* has a preterminal node *P* occupied by a lexical item l_1, and there is another lexical item l_2 such that the f-structure determined by the lexical entry of l_1 properly subsumes that determined by the lexical entry of l_2, and that of l_2 subsumes the f-structure associated with *P* in *S* (the complete structure, after all unifications have been carried out). Then S is blocked.

Importantly, defining morphological blocking as in (5) leaves no obvious way to capture the facts of German and Icelandic, since the subsumption relationship outlined in the definition above does not exist for the relevent sets of suffixes.

5.5. Faithfulness, correspondence, and the morphology-syntax interface.

In chapters 2 and 3 we proposed three constraints that enforce different types of faithful morphological expression of morphosyntactic features associated with syntactic representations. The definitions we arrived at for these constraints were dictated by the inflectional patterns of the languages under investigation. It is therefore particularly interesting to note the similarity of the constraints proposed in this dissertation to well-established constraint families proposed to account for various phonological phenomena.

Recall from chapter 1 that we adopt a grammatical architecture in which inflected words do not formally constitute the terminal nodes of syntactic structures. Instead, we are exploring the proposal that syntactic terminal nodes consist of bundles

of morphosyntactic features, and that the terminal nodes are associated with the inflected forms that constitute the output of the lexicon.

The association between syntactic and morphological representations is quite similar to *Correspondence Theory*. Correspondence Theory was originally developed by McCarthy and Prince (1995) to account for a number of phonological alternations found in various reduplication phenomena. Correspondence relations are established in GEN both between structures in the input and the output candidates, and between structures in the output candidates. That is, in McCarthy and Prince (1995) correspondences hold between prosodic units and the input, and between prosodic units candidate-internally. We advocate allowing the grammar to establish similar correspondences between non-phonological units of linguistic structures. In particular, we have shown that correspondences between inflected forms and their containing syntactic structures can help elucidate otherwise problematic patterns of inflection.

Correspondences between linguistic objects are regulated by *faithfulness constraints*. A faithfulness constraint demands that some aspect of one correspondent be reproduced in the other. Our three faithfulness conditions on the morphology-syntax interface have a number of parallels with McCarthy and Prince's constraints. Consider first the NO CLASH constraint. NO CLASH stipulates that features of lexical items can't clash with features of syntactic representations. Metaphorically, morphological expression is 'dependent' on features in syntactic representations. That is, the only features that are allowed in surface morphological representations are

features that are also present in the syntax. Intuitively, a nominative-marked inflected form cannot surface in a dative syntactic environment. NO CLASH can thus be reworded as a DEPENDENCE (DEP) constraint. The template for constraints like these is given in McCarthy and Prince (1995: 16). We reproduce the template here, where S_1 and S_2 constitute 'strings' in the original:

(6) The DEP constraint family

General Schema

Every segment of S_2 has a correspondent in S_1.

Our constraint called *NO CLASH* can be renamed MORPHOSYNTACTIC DEPENDENCE. For our purposes, S_1 is equivalent to the syntactic terminal node, a segment is equivalent to a morphosyntactic feature, and S_2 is the morphosyntactic representation. Thus MORPHOSYNTACTIC DEPENDENCE (MS-DEP) can be defined as follows:

(7) MS-DEPENDENCE: Every feature of the inflected word has a correspondent in its associated syntactic terminal node.

The constraint AGREE, on the other hand, is in essence an IDENTITY constraint, since AGREE is best satisfied when there is perfect correspondence between features associated with syntactic terminal nodes and features associated with morphosyntactic representations. McCarthy and Prince's template is given in (8) and our version, MORPHOSYNTACTIC IDENTITY (MS-IDENT) is provided in (9).

(8) IDENT (*f*): Let α be a segment in S_1 and β be a segment in S_2. If α is [γF] then β is [γF].

(9) MS-IDENT: Let α be a syntactic terminal node and β be a morphosyntactic representation. If α is [γF] then β is [γF].

We argued earlier that the ranking of these constraints given in (10) is an effective way to model morphological blocking effects in OT.

(10) *Morphological Blocking.*

MS-DEP >> MS-IDENT

Another constraint is crucial to accounting for German and Icelandic. Recall that both Icelandic and German prefer NPs in which more features are expressed over NPs which satisfy IDENT but which express fewer features. We needed a constraint, called MAX-MS (MAXIMIXE MORPHOSYNTAX), that required that every syntactic feature have an exponent somewhere in the NP. This constraint can also be easily accommodated to the faithfulness family of constraints.

Again, McCarthy and Prince (1995) provide the template for such constraints[1]:

(11) The MAX constraint family

General Schema

Every segment of S_1 has a correspondent in S_2

[1] Though our conception of MAX may more closely match Struijke's (2002) Existential MAX.

In order to account for concord, we want the morphosyntactic version of this constraint to read as follows:

(12) MS-MAX: Every morphosyntactic feature of an NP has a correspondent in a subordinate morphosyntactic representation in the domain of concord[2].

As we noted in chapters 3 and 4, it doesn't matter where, or how many times in the domain of the constraint the feature in question is instantiated, only that it is instantiated *somewhere* in the appropriate domain.

Finally, we proposed one additional constraint, one that penalizes the presence of lexical morphosyntactic features under AP. This is a run-of-the-mill markedness constraint that targets well defined linguistic structures. Very often in OT, when markedness constraints outrank faithfulness constraints we find a phenomenon called "the emergence of the unmarked." This phenomenon is present in German too. The ranking MS-DEP (NO CLASH) >>*STRUC/AP >> IDENT (AGREE) allows the unmarked suffix (i.e. the morphosyntactically empty /-en/ suffix) to surface despite being less faithful to the syntactic context than other potential exponents.

5.6. Conclusion.

The main issue that we have investigated in this dissertation concerns the appropriate mechanisms for ensuring that the right inflected form surfaces in the right place in a sentence. Much of the data that we looked at is problematic for an account of the morphology-syntax interface that relies on 'spelling out' lexical

[2] Intuitively, the domain of concord includes the nominal head and its lexical modifiers.

morphosyntactic features of a word in a syntactic structure, and some version of morphological blocking. Problems arise because these approaches have no mechanism for considering inflectional properties of co-constituents within the domain of concord, and no mechanism for allowing less specific inflected forms to surface.

We have shown that an Association approach to concord avoids these problems, and still allows for a straightforward characterization of a range of concord systems, from the relatively simple system like the one found in Swedish, to the considerably more complex paradigms in Icelandic and German. While languages vary, the basic factor driving the variety of concord patterns is the interaction of faithfulness constraints on the expression of morphosyntactic features with the range of outputs of the lexicon. The more complex system in German is due in part to an additional constraint that suppresses the expression of features in the Adjective Phrase of morphosyntactic features expressed elsewhere in the NP.

Appendix

Features in Icelandic Paradigms

Table A.1. The Icelandic Noun Paradigm.

singular	MASCULINE (horse)	NEUTER (flower)	FEMININE (shell)
NOMINATIVE	hest-ur [+nominative] [-oblique] [+masculne]	blóm-	skál
ACCUSATIVE	hest-		
GENITIVE	hest-s [+oblique] [+genitive] [-plural]	blóm-s	skál-ar [+feminine] [+oblique] [+genitive] [-plural]
DATIVE	hest-i [-feminine] [+oblique] [-plural]	blóm-i	skál
plural			
NOMINATIVE	hest-ar [+masculne] [-oblique] [+nominative] [+plural]	blóm-	skál-ar [+feminine] [-oblique] [+plural]
ACCUSATIVE	hest-a [+masculne] [-oblique] [+plural]		
GENITIVE	hest-a [+oblique] [+genitive]	blóm-a	skál-a
DATIVE	hest-um [+oblique]	blóm-um	skál-um

Table A.2. The Icelandic Strong Adjective Paradigm.

singular 'yellow'	MASCULINE	NEUTER	FEMININE
NOMINATIVE	gul-ur [+masculne] [-oblique] [+nominative]	gul-t [-masculne] [-feminine] [-oblique] [-plural]	gul
ACCUSATIVE	gul-an [+masculine] [-oblique]		gul-a [+feminine] [-oblique] [-nominative] [-plural]
GENITIVE	gul-s [+oblique] [+genitive] [-plural]		gul-rar [+feminine] [+oblique] [+genitive] [-plural]
DATIVE	gul-um [+oblique]	gul-u [-masculne] [-plural]	gul-ri [+feminine] [+oblique] [-plural]
plural			
NOMINATIVE	gul-ir [+masculne] [-oblique] [+nominative] [+plural]	gul	gul-ar [+feminine] [-oblique] [+plural]
ACCUSATIVE	gul-a [+masculne] [-oblique] [+plural]		
GENITIVE	gul-ra [+oblique] [+genitive]		
DATIVE	gul-um [+oblique]		

Table A.3. The Icelandic Weak Adjective Paradigm.

singular	MASCULINE	NEUTER	FEMININE
NOMINATIVE	gul-i [+masculine] [+nominative] [-plural] [+definite]		
ACCUSATIVE		gul-a [+definite]	gul-u [-nominative] [+feminine] [+definite]
GENITIVE			
DATIVE			
plural			
NOMINATIVE		gul-u [+plural] [+definite]	
ACCUSATIVE			
GENITIVE			
DATIVE			

References

Ackerman, Farrell. 1990. The Morphological Blocking Principle and Oblique Pronominal Incorporation in Hungarian. In K. Dziwirek, P. Farrell, and E Mejías-Bikandi (eds) *Grammatical Relations: A Cross-Theoretical Perspective.* Stanford: CSLI Publications.

Ackerman, Farrell, and Gert Webelhuth. 1998. *A Theory of Predicates.* Stanford CA: CSLI Publications.

Anderson, Stephen R. 1992. *A-Morphous Morphology.* Cambridge Studies in Linguistics 62. Cambridge: Cambridge UP.

Andrews, Avery D. 1990. Unification and Morphological Blocking. *Natural Language and Linguistic Theory* 8: 507-557.

Aronoff, Mark. 1976. *Word Formation in Generative Grammar.* Cambridge MA: MIT Press

Archangeli, Diana. 1988a. *Underspecification in Yawelmani Phonology and Morphology,* 1988, Outstanding Dissertations in Linguistics, New York: Garland Publishing.

-- -- 1988b. Aspects of Underspecification Theory. *Phonology* 5: 183-207.

Bierwisch, Manfred. 1967. Syntactic features in morphology: general problems of so-called pronominal inflection in German. In *To Honor Roman Jakobson: Essays on the Occasion of his Seventieth Birthday,* Volume 1. The Hague: Mouton, 239-270.

Blevins, James P. 1995. Syncretism and Paradigmatic Opposition. *Linguistics and Philosophy* 18: 113-152.

-- -- 1998. Markedness and Blocking in German Declensional Paradigms. In B. Stiebels and D. Wunderlich (eds.) *Lexicon in Focus*, Studia Grammatica 45: 83-103. Berlin: Akademie-Verlag.

-- -- 2000. Markedness and Agreement. *Transactions of the Philological Society* 98: 233-62.

Bochner, Harry. 1993, *Simplicity in Generative Morphology.* New York: Mouton de Gruyter.

Börjars, Kersti. 1998. *Feature Distribution in Swedish Noun Phrases.* Publications of the Philological Society. Oxford: Blackwell.

Börjars, Kersti, and Mark Donohue. 2000. Much ado about nothing: features and zeroes in Germanic noun phrases. *Studia Linguistica* 54(3): 309-353.

Börjars, Kersti, Nigel Vincent, and Carol Chapman. 1997. Paradigms, periphrases, and pronominal inflection: a feature-based account. in G. Booij an J. van Marle (eds.), *Yearbook of Morphology, 1996,* 155-180. Dordrecht: Kluwer.

Bresnan, Joan, and Sam A. Mchombo. 1995. The Lexical Integrity Principle: Evidence from Bantu. *Natural Language and Linguistic Theory* 13: 181-254.

Chomsky, Noam. 1995. *The Minimalist Program.* Cambridge MA: The MIT Press.

DiSciullo, Anna-Maria, and Edwin Williams. 1987. *On the Definition of Word.* Cambridge MA: MIT Press.

Durrell, Martin. 1979. Some Problems in the Morphology of the German Noun Phrase. *Transactions of the Philological Society*. Oxford: Basil Blackwell.

Einarsson, Stefán. 1949. *Icelandic: Grammar, Texts, Glossary.* Baltimore: The Johns Hopkins Press.

Hankamer, Jorge, and Line Mikkelsen. 2002. A Morphological Account of Definite Nouns in Danish. Paper presented at the UCSD Workshop on Periphrasis and Paradigms, April 12-13.

Harris, James W. 1991. The Exponence of Gender in Spanish. *Linguistic Inquiry* 22(1): 27-62.

Hawkins, John A. 1978. *Definiteness and indefiniteness: a study in reference and grammaticality prediction.* London: Croom Helm.

Holmes, Philip, and Ian Hinchliffe. 1994. *Swedish: A Comprehensive Grammar.* New York: Routledge.

Hughes, Michael. 2000. Noun Phrase Internal Concord in German: a Morphological Approach. *Linguistic Notes from La Jolla 20: Proceedings of the fifth annual Southwest Workshop on Optimality Theory*.

Jackendoff, Ray. 1997. *The Architecture of the Language Faculty.* Linguistic Inquiry Monographs. Cambridge MA: MIT Press.

Kathol, Andreas, 1999. Agreement and the Syntax-Morphology Interface in HPSG. In: Levine-Robert-D. and Green-Georgia-M. (eds.). *Studies in Contemporary Phrase Structure Grammar.* Cambridge, England : Cambridge UP.

Kiparsky, Paul. 1973. 'Elsewhere' in Phonology. In Stephen R. Anderson and Paul Kiparsky (eds.), *A Festschrift for Morris Halle,* 93-106. New York: Holt, Rinehart, and Winston.

Kress, Bruno. 1982. *Isländische Grammatik.* Leipzig: Max Hueber Verlag.

Lambrecht, Knud. 1994. *Information Structure and Sentence Form: Topic, Focus, and the Mental Representations of Discourse Referents.* Cambridge: Cambridge UP.

Lapointe, Steven G. 1980. *A Theory of Grammatical Agreement*. Ph.D. Dissertation, University of Massachussets at Amherst.

-- -- 1988. Toward a unified theory of agreement. In: Michael Barlow & Charles A. Ferguson (eds.) *Agreement in Natural Language: Approaches, Theories, Descriptions.* Stanford: Center for the Study of Language and Information. 67-88.

Lederer, Herbert. 1969. *Reference Grammar of the German Language: based on Grammatik der deutschen Sprache by Dora Schulz and Heinz Griesbach.* New York: Charles Scribner's Sons.

Lieber, Rochelle. 1992. *Deconstructing Morphology: Word Formation in Syntactic Theory.* Chicago and London: The University of Chicago Press.

Lloret, Maria-Rosa, and Joaquim Viaplana. 1997. On the Morphological Category of Gender in Catalan and Spanish. In Wolfgang U. Dressler, Martin Prinzhorn, and John R. Rennison (eds.) *Advances in Morphology. Trends in Linguistics: Studies and Monographs 97*. Berlin & New York: Mouton de Gruyter.

Lockwood, W. B. 1964. *An Introduction to Modern Faroese.* Copenhagen: Munksgaard.

Lumsden, John S. 1992. Underspecification in Grammatical and Natural Gender. *Linguistic Inquiry* 23: 469-486.

Lyons, Christopher. 1999. *Definiteness.* Cambridge: Cambridge UP Press.

Marit, Julien. 2002. Determiners and Word Order in Scandinavian DPs. *Studia Linguistica* 56: 264-315.

Mascaró, Joan. 1996. External allomorphy and contractions in Romance. *Probus* 8: 181-205.

McCarthy, John, and Alan Prince. 1995. Faithfulness and Reduplicative Identity. In Jill Beckman, Laura Walsh Dickey, and Suzanne Urbanczyk (eds.) *Papers in Optimality Theory.* University of Massachusetts Occasional Papers in Linguistics 18. Amherst MA: Graduate Linguistic Student Association.

Miller, Philip H; Geoffrey K. Pullum, & Arnold M. Zwicky. 1992. The Principle of the Inaccessibility of Phonology by Syntax: Three Apparent Counterexamples in French. *Linguicsticae Investigationes* 16(2) 317-343.

Mohanan, K.P. 1991. On the Bases of Radical Underspecification. *Natural Language and Linguistic Theory* 9: 285-325.

Perlmutter, David M. 1998. Interfaces: Explanation of Allomorphy and the Architecture of Grammars. in Steven G. Lapointe, Diane G. Brentari, and Patrick M. Farrell (eds.) *Morphology and its Relation to Phonolgy and Syntax.* Stanford, CA: Center for the Study of Language & Information: 307-359.

Sigurðsson, Halldór Ármann. 1993. The Structure of the Icelandic NP. *Studia Linguistica* 47(2): 177-197.

Spencer, Andrew, and Louisa Sadler. 2001. Syntax as an Exponent of Morphological Features. In: Geert Booij and Jaap van Marle (eds.) *Yearbook of Morphology 2000*. Dordrecht: Kluwer, 71–96.

Spencer, Andrew. 2003. Paradigm-based morphosyntax: the German genitive. University of Essex ms.

Steriade, Donca. 1987. Redundant Values. In A. Bosch, B. Need, and E. Schiller (eds.) *Papers from the parassession on autosegmental and metrical phonology.* (CLS 23:2) Chicago: Chicao Linguistic Society.

Struijke, Caro. 2000. *Existential Faithfulness: A study of reduplicative TETU, feature movement, and dissimilation.* Ph.D dissertation, University of Maryland.

Stump, Gregory. 2001. *Inflectional Morphology*. Cambridge: Cambridge UP.

Tranel, Bernard. 1994. French liaison and elision revisited: A unified account within Optimality Theory. In: Claudia Parodi, Carlos Quicoli, Mario Saltarelli, & Maria Luisa Zubizarreta (eds.) *Aspects of Romance Linguistics: Selected papers from the linguistic symposium on Romance Languages XXIV*. Washington: Georgetown University Press: 1996: 433-455.

Tranel, Bernard. 1998. Suppletion and OT: On the Issue of the Syntax/Phonology Interaction. In Emily Curtis, James Lyle, and Gabriel Webster (eds.) *The Proceedings of the Sixteenth West Coast Conference on Formal Linguistics.* Stanford, CA: CSLI Publications: 415-429

Wechsler, Stephen, and Larisa Zlatić. forthcoming. *The Many Faces of Agreement.* Stanford CA: CSLI Publications.

Zwicky, Arnold M. 1985. How to Describe Inflection. BLS 11.

Zwicky, Arnold M. 1986. German Adjective Agreement in GPSG *Linguistics* 24: 957-990.