

# The Late Insertion of Germanic Inflection\*

ULI SAUERLAND, MIT

second draft, March 1996

In this paper, I will provide evidence that syntactic heads are filled with phonological content after the application of syntactic transformations. The question of whether syntax precedes or follows morphology in a derivational grammar divides morphological theories into two classes: lexicalist theories assume that morphology precedes syntax; late insertion theories assume the opposite order. In principle hybrid theories assuming late insertion in some case, early insertion in others would also be possible, but the two extreme views are simplest and hence conceptually preferred. Therefore, arguments against one of the extremes, are arguments in favor of the other extreme. I provide two arguments against the pure version of the lexicalist theory in sections 1 and 2. In section 3, I will present an argument in favor of late insertion.

The first argument in section 1 rests on the observation that there are case of properties of lexical items that are not specified in the output of morphology, but that are accessible to syntax. Hence, there is a syntax-morphology mismatch, if the output of morphology is the input of syntax. On a pure lexicalist theory, the resolution of this mismatch requires a new level of grammar, the level of paradigms, where the missing features are added to the outputs of morphology, which is not necessary on a late insertion theory. Evidently, the need for an extra level of grammar argues against the lexicalist theory, unless there's strong independent support for this level. In section 2, I will refute the claim that independent evidence for the level of paradigms exists. The independent evidence consists out of morphological universals which have been stated as conditions on paradigm structure. I show in 2 that these conditions can be derived within a late insertion theory and, in some cases, even be unified. In section 3, I show that, in the adjective inflection in Germanic, syntactic features are deleted

---

\*This paper was written to satisfy part of the generals requirement of the Ph.D.-program in linguistics at MIT. I thank my generals committee (Kai von Fintel, Noam Chomsky, and Jim Harris), my classmates (Judy Baek, David Braun, Paul Hagstrom, Danny Fox, Ingvar Løfsted, Martha Jo McGinnis, Rob Pensalfini, Norvin Richards), Alec Marantz, Michael Kenstowicz, Susanne Wurmbrand, Kazuko Yatsushiro, Jonathan Bobaljik, and most of all Morris Halle for discussion and/or moral support. The preparation of this paper was supported by an HSP II/AUFE Grant awarded by the German Academic Exchange Service (DAAD) to Uli Sauerland.

before morphemes<sup>1</sup> are inserted into these heads. Furthermore, I show that the deletion is triggered by the syntactic environment beyond the affected head. Hence, this deletion isn't stateable within a lexicalist theory because on the early insertion view the information about the syntactic environment becomes available only after the lexical items have been formed.

## 1 Underspecification and the Syntax-Morphology Interface

The first argument for late insertion arises from the mismatch between full specification of lexical heads in syntax and underspecification in morphology. As we will see, this syntax-morphology mismatch can be dealt without complications on the late insertion view, but is much more problematic for the lexicalist view.<sup>2</sup> Intuitively we can already see, why this is the case: On the late insertion view, the fully specified system (syntax) precedes the underspecified one (morphology), so information is lost as the derivation proceeds. The loss of information in the course of the derivation is a natural and easy to describe phenomenon. On a lexicalist theory, on the other hand, the underspecified system precedes the fully specified one, so information needs to be added, which is in general more difficult. Before we go through this argument in more detail, I will present the arguments that lead to the morphology-syntax mismatch with respect to the specification of the lexical heads.

### 1.1 Underspecification of Morphological Output

In the best of all possible worlds – morphologically speaking – syntactic function and morphological form exactly mirror each other. This means for the inflected forms of a word that each form should ideally express a certain combination of syntactic properties; Carstairs (1987) refers to this situation as a one-to-one correspondence. On the surface, natural languages are far from the ideal one-to-one match – most often the same inflected form of a word serves many different syntactic functions – e.g., in the neuter gender in German, nominative and accusative case are not distinguished morphologically; in English, all the forms of the present tense of regular verbs are the identical except for the third person singular.

Regularities among the cases of syncretism, the cases showing a many-to-one match between syntax and morphology are the motivation for underspecification. If there were no regularities, we would be inclined to believe that syncretism is a superficial phenomenon best explained as accidental homophony. Put differently, we would think that there really is a one-to-one match between

---

<sup>1</sup>Throughout the paper, the term *morpheme* means the phonological strings that are the smallest units of morphological analysis.

<sup>2</sup>The argument in this section is already hinted at in Halle & Marantz (1994:278). I also thank Alec Marantz for discussion.

syntactic properties and phonological form and, wherever we seem to hear the same sounds as expressions of different syntactic features, these really are different, but the difference isn't pronounced. If this was the correct view of syncretism, we would expect no regularities amongst the cases of syncretism whatsoever.

Luckily our situation is different. Since the beginnings of morphology, researchers observed that there are considerable regularities amongst the cases of syncretism and that the regularities call for theoretical explanation. See for example Jespersen (1927:37) criticizing traditional grammars: *The arrangement is paradigmatic, all the forms of some single word being placed together; thus there is no attempt to bring together the same ending if it is found in various paradigms* or Jakobson (1971 (1936):67) *Bezeichnend sind die verschiedenartigen Äußerungen des Kasussynkretismus* ('Telling are the different instances of case syncretism'.) Let us assume that in general syncretism is telling; a phenomenon that indicates that there is more structure to an inflectional paradigm than being a list of forms.

One simple case of an heavily syncretic paradigm is the English verbal inflection exemplified in the table below.<sup>3</sup> In the past tense the verbal ending is /d/ regardless of the subject. In the present tense the situation is almost the same; the bare verb-stem can be used with any kind of subject except for the third person singular. Here the ending /s/ is obligatory.

	-past	+past
1. Sg.	like	like-d
2. Sg.	like	like-d
3. Sg.	like-s	like-d
1. Pl.	like	like-d
2. Pl.	like	like-d
3. Pl.	like	like-d

The question is how the information about inflectional endings of the above table is represented linguistically. The representation we rejected was that of a list, similar to the above table, where /d/ would be listed six times. The natural way to describe the role of the past tense suffix in English is to assume that /d/ doesn't express person and number information. Or in other words, /d/ is only specified for (past) tense. The main advantage of this description over the one we rejected is simply that it saves space. In fact it is the most memory-efficient description of the English past tense inflection possible.

---

<sup>3</sup>The argument presented receives its force from facts in languages which have a rich morphology that are essentially similar to the English facts presented here. The rudimentary morphology of English itself is used here only for expository convenience.

### 1.1.1 The Blocking Principle

The most memory-efficient description of the present tense inflection in English seems to be the following: /s/ is suffixed in the 3. person singular and nothing is suffixed elsewhere. The word *elsewhere* in this context is used to refer to any combination of person and number information except for the 3. person singular. This class, the class of combinations of person and number other than the 3. person singular doesn't seem to form a natural class,<sup>4</sup> and hence we want to avoid that the property of not being a 3. person is directly stateable. The explanation of the fact that all the non-third person singular forms are the same, is that this form is not specified for person or number just like the /(e)d/-form in the past tense. However, to explain the English present tense we need more than the assumption that the /(e)s/-form is specified for the 3. person singular, and the bare stem not specified for person or number, because otherwise using the bare stem with 3. person singular subjects should be possible.

The reason that it's impossible to use the underspecified bare stem for the 3. person singular, seems to be that there is a more specified form available for the 3. person singular. This seems to be in general the case—more specified forms block the insertion of less specified forms—whereas cases of optionality are not attested. Hence, it is likely that grammar not only uses underspecified forms, but also contains a general principle that bans the use of underspecified forms instead of more specified ones (cf. Kiparsky (1983)). This principle can be formulated as the following 'blocking principle':

**Blocking Principle:** If one form possesses all the properties of another form and some more specific properties, the more specified form must be used wherever possible.

## 1.2 Full Specification in Syntax

In the previous section, we have seen that words are morphologically underspecified – properties relevant to the syntax are nevertheless not expressed morphologically. It's generally tacitly assumed that properties that are not expressed in the morphology are nevertheless present in syntax; at least, if the same properties are overtly expressed in other cases. In other words, it's assumed that syntactic heads are fully specified. However, to my knowledge no arguments were presented in favor of this assumption. Even worse, some work on Case-matching phenomena has argued against this assumption. In this section, I argue for the full-specification; in favor of the claim that features that are not expressed in the

---

<sup>4</sup>Besides the fact that it is hard to find a unifying property of this class, it also would be inefficient if the property 3. person singular was not decomposed into more basic properties like being singular and not being a participant in the conversation. Also the syncretism pattern in the past tense forms of English *be* argues against such a class: The 1. and the 3. person singular are homophonous (*was*), which would argue for another primitive property of being 1. or 3. person singular.

morphology are present for the purposes of syntax, and propose an explanation of Case-matching phenomena that doesn't use underspecification.

How can we verify the claimed full syntactic specification? If syntactically underspecified words existed, how would we be able to distinguish them from fully specified words? Obviously, the morphological form of a word itself won't tell us, since we assume that the syntactically underspecified words are morphologically underspecified as well. We have to look at cases where the environment a word occurs in provides more information about the word's properties than the morphological form of the word itself; cases where the syntactic environment further specifies a word. More specifically, there are two scenarios where the predictions of an underspecified syntax differ from those of a fully specified one. The first scenario is one where the environment at one level of grammar allows further specification of a property, but not at the level where the specified property is relevant. Here, syntactic underspecification would predict that a mismatch between the two levels should be tolerated, whereas full specification makes the opposite prediction. The second scenario is one where the environment specifies a word for two conflicting properties. Again, underspecification predicts that such cases should be grammatical, whereas full specification predicts them to be ungrammatical. I will now show examples of both scenarios that bear out the predictions of full syntactic specification. Then I'll look at Case-matching, which is superficially a case of the latter scenario where the predictions of the fully specified syntax seem to be wrong. As I will show, an alternative explanation of the facts consistent with full specification is available.

The first scenario was that of a property being specified by the syntactic environment, but not at the relevant level. This is instantiated in (1) where the grammatical number of *the sheep*, a semantic property, is specified only by the means of the inflection on the verb, but not expressed in the nominal phrase *the sheep*. We can assume without loss of generality that the expression of number in the verbal inflection isn't accessible at the level of interpretation.<sup>5</sup> If *the sheep* was underspecified for number, both sentences in (1) would look identical to the interpretive system. But, this is obviously wrong, (1-a) receives only a singular interpretation, (1-b) only a plural interpretation, as full specification predicts.<sup>6</sup>

(1) a. The sheep jumps over the fence.

---

<sup>5</sup>If it was the other way round, namely the verbal inflection was visible for interpretation and the number marking on the subject wasn't, we could make the same point with examples where number is morphologically manifest only on the subject, not on the verb, as e.g. in the past tense. If both properties, the nominal and the verbal manifestation of number, were visible to the interpretive system, our theory would relegate the checking of agreement to the interpretive system—an undesirable consequence. In fact, current work in theoretical syntax assumes that the features of the verbal agreement mustn't be visible for the interpretive system (see Chomsky (1995)).

<sup>6</sup>It is obviously possible to amend an underspecified syntax with a unification principle to avoid the problem raised in the text. However, the introduction of such new principles into the theory of grammar is conceptually most undesirable.

- b. The sheep jump over the fence.

The second scenario to look at is that of a morphologically underspecified item receiving two contradicting specifications from its syntactic environment. We can construct such an example using multiple agreement in German. In German nominal phrases, determiner, adjective and noun agree with each other in number, gender, and case. If, as is usually assumed, agreement is a checking operation that checks whether a pair of two lexical items has matching features, we might expect the following: of the three pairs that could be checked (Determiner, Adjective), (Determiner, Noun) and (Adjective, Noun) only two are actually checked for agreement. Because this is more efficient than checking all three pairs, general economy considerations force this view upon us.<sup>7</sup> So if agreement is checked only in two pairs, we have one ‘middle’ item that is checked against both. The desired scenario arises if the ‘middle’ item is morphologically underspecified and the other two items have conflicting specifications with respect to the property that the ‘middle’ item isn’t specified for.

The argument has to take into account that we don’t know which of the three agreeing words is actually the ‘middle’ item. In (2), we see the examples for all three possible ‘middle’ items which is morphologically underspecified for gender.<sup>8</sup> All three examples are ungrammatical, as predicted by a fully specified syntax where the ‘middle’ item is in the syntax specified for only one of the two genders that are morphologically possible. An underspecified syntax on the other makes the wrong prediction, that at least one of the examples in (2) should be grammatical, because the ‘middle’ item if it’s underspecified for gender agrees with both of the other two items.<sup>9</sup>

- (2) a. \*Ein grün-er Männchen ist angekommen.  
           a<sub>masc/neut</sub> green<sub>masc</sub> small man<sub>neut</sub> is arrived.

<sup>7</sup>That the sequence Determiner–Adjective–Noun only involves two checking operations is in fact a necessary consequence of two assumptions of current minimalist syntax: Firstly, that feature checking is done by movement driven by the features that have to be checked to achieve a local configuration of the checking features. Secondly, that this movement may not skip structurally intervening items that have the same features (Shortest Move). I leave this for the reader to verify.

<sup>8</sup>A similar argument can be made for Case, but here it isn’t possible to construct an example where the determiner is the ‘middle’ item. Examples with the adjective (example (i-a)) or the noun (example (i-b)) being the item that is checked against twice show that at least in these cases the predictions of the full specification hypothesis are borne out.

- (i) a. \*den glücklichen Mannes  
           the<sub>ACC</sub> happy<sub>ACC/GEN</sub> man<sub>GEN</sub>  
       b. \*die schönen Frau  
           the<sub>NOM</sub> beautiful<sub>ACC/GEN/DAT</sub> woman<sub>NOM/ACC/GEN/DAT</sub>

<sup>9</sup>Again, the addition of a unification algorithm to the theory of grammar would even in combination with an underspecified make the right prediction in this case. However, the conceptual argument against unification of the preceding footnote applies.

- b. \*Da-s grün-e Frau ist angekommen.  
 the<sub>neut</sub> green<sub>neut/fem</sub> woman<sub>fem</sub> is arrived.
- c. \*De-r grün-en See ist warm.  
 the<sub>masc</sub> green<sub>fem</sub> lake<sub>masc/sea</sub><sub>fem</sub> is warm.

In summary, we saw instantiations of both scenarios that can possibly decide between a theory of syntax that allows underspecified heads and one that doesn't, and both cases bore out the prediction of the full specification hypothesis. An array of facts that have been used as an argument in favor of syntactic underspecification are the so called *Case matching effects*, where a morphosyntactic condition, the Case filter, is sensitive to syncretism. The first examples from Groos & Riemsdijk (1981) of this kind were similar to (3) with free relative clauses from German. I will focus on these cases here.<sup>10</sup>

- (3) a. Der Junge ißt, was auf den Tisch kommt.  
 the boy eats [<sub>CP</sub> what<sub>NOM/ACC</sub> on the table comes]
- b. \*Der Junge mag, wer/wen ihm zu essen gibt.  
 The boy likes [<sub>CP</sub> who<sub>NOM/who</sub><sub>ACC</sub> him to eat gives]

Case-matching seems to be an instantiation of the second scenario of above: The relative pronoun or *wh*-word serves seems to have to satisfy two conflicting requirements. The head of a free relative clause, *was* in (3-a), *wer/wen* in (3-b), and *wer* in (3-c) seems to serve double duty: It is the subject of the relative clause, and hence receives nominative Case, and is also the object of the matrix clause, where it receives accusative Case from. The fact is that only the neuter form *was*, which is morphologically underspecified for the nominative-accusative distinction, is allowed to serve this double duty function. (3-b) on the other hand is ungrammatical with either the nominative or the accusative

<sup>10</sup>A similar effect was found with across-the-board extraction in Polish (Dyła 1984) and Russian (Franks 1994), topicalization in Norwegian (Taraldsen 1981), and right-node raising in German Karttunen & Zaenen (1984). In (i) I give a German example of across-the-board movement; the other two cases are subject to interspeaker variation and hence don't concern me here. The account offered in the text carries over to all the cases of Case-matching.

- (i) a. Welcher Speise verschreibt sich der Snob *t* und enthält sich  
 which food<sub>DAT/GEN</sub> devotes self the snob *t*<sub>DAT</sub> and abstains self the  
 der Mönch *t*?  
 monk *t*<sub>GEN</sub>
- b. \*Welches Getränks / Welchem Getränk verschreibt sich der Snob  
 which beverage<sub>GEN</sub> / which beverage<sub>DAT</sub> devotes self the snob  
*t* und enthält sich der Mönch *t*?  
*t*<sub>DAT</sub> and abstains self the monk *t*<sub>GEN</sub>

In both examples in (i), the extracted *wh*-phrase is an argument of two verbs and hence has to satisfy the Case-marking requirement of two verbs. *Sich verschreiben* ('devote oneself to') marks its complement with dative Case, *sich enthalten* ('abstain from') marks its complement with genitive Case; so, the Case requirements conflict. The fact is that only the first sentence where the extracted *wh*-phrase is morphologically ambiguous between the dative and genitive Case is well formed.

form. Furthermore, (4) shows that a free relative is possible with the animate *wh*-word, as long as the case requirements of the two verbs are the same.

- (4) a.           Wer       ihm zu essen gibt, wird       von dem Jungen gemocht.  
           [<sub>CP</sub> Who<sub>NOM</sub> him to eat gives,] becomes by the boy liked.
- b. Der Junge mag,       wen       seine Eltern nicht mögen.  
      The boy likes [<sub>CP</sub> who<sub>ACC</sub> his parents not like]

Superficially, these facts seem to constitute a clear argument for a lexicalist approach where the syntax may be underspecified, because the phonological realization in all of these cases seems to have influence on the syntax. However, given the arguments against an underspecified syntax, it seems desirable to find an alternative analysis of the Case-matching phenomena. An additional argument against the underspecification analysis is that it doesn't fit into the usually assumed syntax. In syntax it is argued that each nominal phrase may occupy only one argument position and may only be case marked once. Hence, the idea of the relative pronoun serving 'double duty' in both the matrix and relative clause is incompatible with what is standardly assumed in theoretical syntax.

Since the assumption that the head of the free relative is Case-marked twice contradicts standard assumptions, let us assume that there are in fact two copies of this head, one of which is deleted. One of the two copies would then be deleted in the phonological branch of the derivation. On this view the Case-matching facts could be the consequence of a strict condition of phonological identity, that requires that both copies of the *wh*-word are phonologically exactly identical. This condition is fulfilled in (4-a) and hence deletion as shown in (5) is possible.

- (5) Der Junge ißt       was       ~~was~~ auf den Tisch kommt  
      the boy eats [<sub>DP</sub> what [<sub>CP</sub> what on the table comes]]

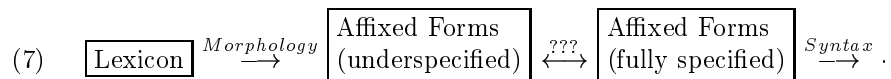
(6) on the other does not fulfill the phonological identity requirement, and hence is it impossible to derive (4-b). (6) without deletion is grammatical, though.

- (6) Der Junge mag       den       der       ihm zu essen gibt.  
      The boy likes [<sub>DP</sub> who<sub>ACC</sub> [<sub>CP</sub> who<sub>NOM</sub> him to eat gives]]

### 1.3 Necessity of the Paradigm-Level

We have seen that to an overwhelming extent the output of morphology, inflected forms of lexical items, is underspecified. But in the syntax, these forms act as though they were fully specified. For any lexicalist theory, this mismatch gives rise to a serious dilemma: In the output of morphology the features are underspecified, but in the syntax, that follows morphology, the features are fully specified. This situation is indicated in the following sketch:





The question is what does the ‘???’-part consists of. It has to fill in the syntactic features that are missing from the outputs of morphology.

A first possibility to remedy this situation would be include in the place marked by the question marks in (7) rules that add missing features arbitrarily. E.g. to an item missing any Gender feature the rules would add any possible combination of gender features from the feature inventory of the particular language. It is however quickly apparent the this approach overgenerates in precisely those cases where the blocking principle applies. If the approach based on arbitrary addition of features was correct, we would expect that the general default form could also serve for those cases that the specific forms exists for. This however is blocked by the blocking principle.

An operation or condition is necessary that salvages this situation, an operation that adds the necessary features to the syntactic units, between morphology and syntax, but doesn’t overgenerate. The first one to discuss this problem was Kiparsky (1983) who recognized the need to postulate a novel constraint, his avoid synonymy condition, to solve the mismatch problem. The most explicit proposal to solve the mismatch problem within a lexicalist approach was made by Wunderlich & Fabri (1994). Their proposal makes it very clear, that a solution to the mismatch problem within lexicalism must postulate a new level of grammar; the *paradigm* level. I will first argue abstractly that a lexicalist view forces the postulation of the paradigm level – a conceptually undesirable step. Then I will exemplify concretely what it is the paradigm level must do; specifically, what it does in the system of Wunderlich & Fabri (1994).

The blocking principle involves comparison. On the lexicalist view, the comparison takes place between fully inflected forms; the use of a less specified form is blocked by a more specified form. So, it is necessary to derive all the forms of that are possibly more specified than a given form, in order to decide what kind of additional syntactic specification a morphologically underspecified item may receive. The only way to procedurally describe how this comparison takes place is, as far as I can see, to generate other possible inflected forms and then do the comparison. The forms generated have to be stored and compared in a new level of grammar. Since the representations that the new level has to make use of are essentially tables of inflected forms with their feature specifications, the new level is called the level of paradigms.

The purest implementation of such a comparison procedure I have seen is given by Wunderlich & Fabri (1994). It is instructive to see how much ingenuity is needed to work around the morphology-syntax mismatch with respect to specification. Hence, I will give the concrete example of how English inflection is treated on their account. Wunderlich & Fabri (1994) assume that the paradigm for them is a multidimensional array with as many dimensions as there are fea-

tures relevant to the syntax.<sup>11</sup> This array is then filled with inflected form, where the blocking principle is expressed by the order of the fill-in operations. Namely, the most specified items are filled in first. Wunderlich & Fabri (1994) state this as a condition on the process of filling a paradigm given in (8).

- (8) **Specificity** (Elsewhere principle): Always apply the most specific rule. (The most specific cases have precedence.
- a. In case X and Y have the same output: X is more specific than Y, if the input of X is more specific.
  - b. In case X and Y have the same input: X is more specific than Y, if the output of X is more specific.
  - c. Output specificity outranks input specificity. (Wunderlich & Fabri 1994)

Let me now briefly illustrate this with the trivial example of English verbal inflection. The paradigm that is relevant here is essentially isomorphic to the table I gave above.<sup>12</sup> The affixes are specified as:<sup>13</sup>

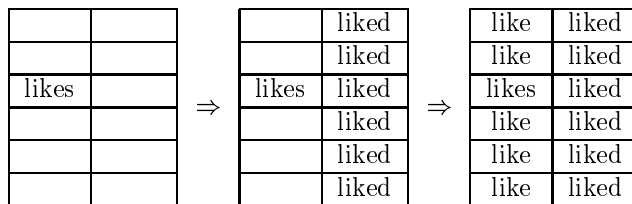
$$\begin{array}{l} /s/ - [-1,-2,-Pl,-past] \\ /d/ - [+past] \\ \emptyset - [-] \end{array}$$

These affixes will be suffixed to the verb stem *like* and then the paradigm will be filled in. Intuitively this is an operation where we have already formed all possible affixed form of the verb stem *like*. We then sort them by specificity of their features. The result is that *like-s* is the most specific form, *like-d* the next most specified, and *like* unspecified. Then we enter the affixed forms into the table; specifically we enter form in all the empty cells where the features of the cell are a superset of the syntactic features of the inflected form.

<sup>11</sup>Wunderlich & Fabri's (1994) assumption that the relevant features can be read of the output of morphology seems to be to optimistic to me. For example in a language like English the distinction between dative and accusative has disappeared, hence no mention of such a distinction will be found in the output of morphology. Nevertheless the distinction accusative vs. dative might be relevant in the syntax. A similar case is the distinction between nominative and accusative case in English, which is only morphologically realized for pronouns, but presumably specified for each noun in the syntax. Here the information for the construction of a paradigm for the nouns has to be predicted from the forms of the pronouns. Despite these problems let us for now assume that it is possible to determine the syntactically relevant features somehow from the morphology.

<sup>12</sup>The person properties can be described in a binary feature system by using the following features: +1: involves a speaking participant and +2: involves an addressed participant. Hence the feature combination +1,+2,-Pl is impossible, as at least two persons must be the intended reference. On the lack of the distinction +1,+2,+Pl (first person inclusive) and +1,-2,+Pl (first person exclusive) in English see Noyer's (1992) discussion of person features.

<sup>13</sup>For clarity, I list the / $\emptyset$ /-suffix above, even though it is the default ending. Wunderlich & Fabri (1994) don't list / $\emptyset$ / if it is the default affix (cf. footnote 23 on the status of / $\emptyset$ /).



We see that it is possible to reconcile a fully specified syntax with an underspecified morphology even on a strict lexicalist view. However on the lexicalist view, any solution to the mismatch problem has to postulate a new level of grammar, the level of paradigms. Despite the frequent descriptive use of the term *paradigm*, it is very undesirable to have to assume such an additional level of grammar. Hence, if a different theory of morphology doesn't require such an extra level, it has to be considered superior to the lexicalist theory.

And indeed, a late insertion theory requires no such extra level as shown in e.g. Halle & Marantz (1993). On the late insertion view of morphology, syntax does not access the lexicon, but a list of syntactic primitives, which I call the *list of syntactic atoms*. All the items on this list are fully specified for all and only the syntactically relevant features. The syntactic derivation creates a tree with syntactic atoms in the head positions. At a later point of the derivation, lexical material is inserted into the syntactic heads. The lexicon is a set of mappings from syntactic features onto phonological information. Because the specified level in this case precedes the underspecified one, the implementation of the blocking principle is straightforward. It follows from the general Paninian principle that application of the more specific rule is preferred.

At this point, the need to postulate the list of syntactic atoms seems to speak against the late insertion theory. But, this isn't the case, since the same information, the information about the properties that matter for syntactic processes and their potential values, is needed for the construction of the paradigms within the lexicalist theory. In fact, it seems that on any account the syntax-morphology mismatch noted above forces the assumption that the information equivalent to the list of syntactic atoms is present independently. At this point, however, an alternative to the late insertion theory seems possible; namely a theory that adopts the list of syntactic atoms, but assumes that the insertion of phonological information takes place before syntactic transformations, and not afterwards. In 3, we will see an argument against such a proposal.

## 2 Morphological Universals

In the previous section we have seen that lexicalist assumptions imply that there must be a level of grammar, the level of paradigms, which isn't needed in a late insertion. Conceptually the level of paradigms is an unwelcome consequence, unless there is independent motivation for such a level. In fact, Bybee (1985), Wurzel (1989), Plank (1991), Carstairs (1987), Carstairs-McCarthy (1994), and

Wunderlich & Fabri (1994) claim to have such independent evidence for the paradigm level. They point out a number of morphological universals – conditions that seem to be satisfied universally by all inflectional paradigms – and furthermore claim that these morphological universals can only be stated by making reference to the paradigm and hence provide evidence for the paradigm level.

In this section, I challenge the claim that the morphological universals provide evidence for the paradigm level. In fact, I claim that the universals the lexicalists’ argument rests on follow more naturally from assumptions about feature structure and the way lexical insertion applies on the late insertion view. Before we go into the details of this proposal, Section 2.1 will clarify the late insertion model of Distributed Morphology I will be assuming. In section 2.2, a number of postulated morphological universals from the literature will be derived from more specific assumptions within the late-insertion model which are in part adopted from the work of Noyer (1992, 1994) and Harley (1994). In 2.4, I will argue that isolated exceptions to the universals of 2.2 should be explained as instances of local homophony, homophony of inflectional endings that may appear in the same position. I will show that there are cases of inflectional paradigms from German dialects which on any theory will have to be explained as cases of local homophony.

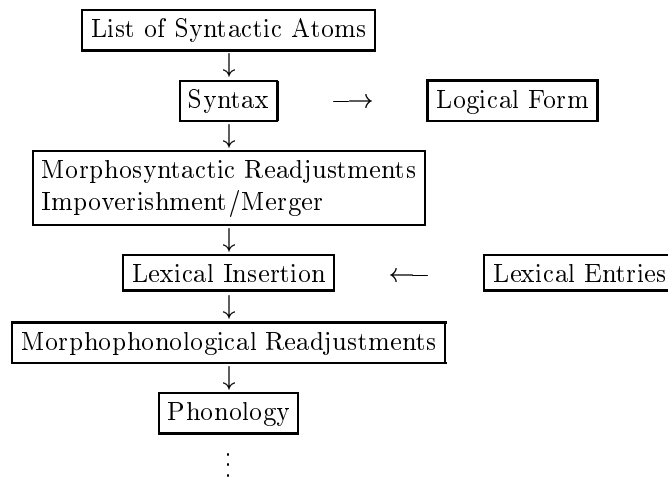
## 2.1 Distributed Morphology

The late insertion view has to assume that the syntactic and the phonological information about lexical heads is accessed at different points of the derivation. Syntax has to operate on syntactic heads that are fully specified for exactly the properties relevant to syntax. Hence, there must be a syntactic lexicon, which I will call the list of syntactic atoms. After a syntactic structure has been built it is mapped on a phonological representation. This mapping of syntactic structure onto a phonological representation is the subject matter of morphology.

A basic observation about this mapping of syntax onto phonology is that frequently syntactic heads correspond to phonological units. The default theory that adopts this observation would be one that maps each syntactic head onto a certain sequence of phonological segments. The entries of the lexicon are lexical insertion rules, mapping a bundle of syntactic features onto a bundle of phonological features. The linearization of the output of lexical insertion is done after lexical insertion took place, in accordance to syntactic constituency and the lexical properties of the morphemes inserted. The concatenation of all these phonological sequences respecting the linear order will be the underlying phonological form of the sentence. The intuition of Distributed Morphology is that this default theory is essentially right and, in the cases where it seems to be wrong, readjustment has taken place. This model of grammar is sketched in figure 1.

There are still a number of open questions at this point: What do the

Figure 1: The structure of grammar



syntactic atoms look like? How does lexical insertion work in detail? What morphosyntactic readjustments occur? The answers to these questions are not evident, and make predictions for the range of morphological variation found crosslinguistically. In the following, I will argue that certain morphological universals lead us to answers for some of the open questions.

## 2.2 Derivation of Morphological Universals

The data that we will discuss in this section are crosslinguistic generalizations about morphological paradigms that have been claimed to represent morphological universals. Summarizing and extending previous work by Noyer and Harley I show that these universals can be derived within a particular version of the late insertion model. The significance of this section is that it refutes an argument to assume a level of paradigms. The argument was that there are morphological conditions that must be stated as applying to the level of paradigms. What I will show is that the paradigmatic conditions can be derived from conditions within the distributed morphology framework. In one case the argument is even stronger; a cyclicity condition within Distributed Morphology will, as I will show, derive three of the paradigmatic conditions.

In this section, I will use the universal postulated quite uncritically as data that helps us to find a particular formulation of the lexical insertion procedure which will imply the universals.<sup>14</sup> To justify the uncritical treatment

<sup>14</sup>In some cases, it is inaccurate to speak of implication of the postulated universal by the formulation of insertion procedure. But, since the universals themselves are only based on

of the universals, I will point out in 2.4 that there is good reason not to take every apparent violation of one of the postulated conditions seriously. There, I argue that even a very unconstrained system of lexical insertion has to assume accidental homophony in some cases.

The following subsections each deal with a specific morphological property for which universal have been claimed. In 2.2.1, generalizations about the inventory of morphological distinctions a language draws will be derived from a morphological feature hierarchy. In 2.2.2, the relative markedness of the different forms within a paradigm will be shown to also be determined by the feature hierarchy. In 2.2.3, the notion of position class, will be derived from the notion of discharge and the assumption that syntactic structure is fully visible to lexical insertion. In 2.2.4, universals about the order of morphemes will be shown to follow from the feature hierarchy and the assumption that morphology obeys the strict cycle condition. In 2.3, further evidence for the morphological cycle will be given based on more complicated interactions between morpheme positions.

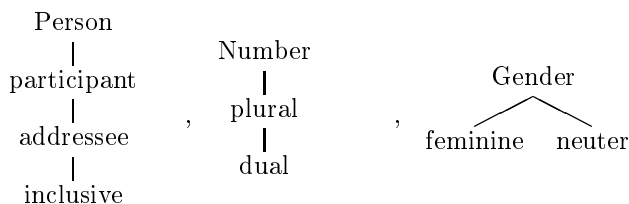
### 2.2.1 Inventory of Morphological Distinctions

To begin with, let us look at the syntactic and semantic distinctions languages express in their morphology. These are to a remarkable extent similar across languages. First, there seems to be a finite list of properties that are specified in the morphological form of a word: Person, Number, Gender, Case, Mood, Tense, Aspect, Voice, and Speech Act (see Bybee (1985), Noyer (1992)). Furthermore, within each of these properties the distinctions are drawn crosslinguistically along the same lines. The type of crosslinguistic difference found is that some languages are more fine-grained, subdividing the classes of the less fine-grained language. But, it rarely occurs that one languages draws distinctions that cross-classify those drawn in another language. Hence, there seems to be a universal hierarchy of the possible distinctions, of which each specific language makes all and only the distinctions down to a certain level. Noyer (1992) studies the distinction in the number, person, and gender marking crosslinguistically in great detail describing such a hierarchy. Following ideas of Bonet (1991) and Noyer (1992), Harley (1994) proposes a hierarchy of morphological features to express the observed hierarchy of distinctions. For person, number, gender marking the hierarchies are the following:<sup>15</sup>

---

observations in a finite number languages, it will be sufficient if the consequence of the model presented here makes the right implication for those languages, rather than being equivalent to the particular formulation of the universal in the literature.

<sup>15</sup>I made two changes to the hierarchies proposed by Harley (1994). The first one is the change from the feature  $\pm$ speaker to  $\pm$ addressee. This has the reason that the hierarchy of Harley (1994) was designed to predict a certain gap in the pattern of clitic-homophonies, that Bonet (1991) found. However, as Harley (1994) already notes, the clitic-distribution of the alleged gap is in fact found in Latin American dialects of Spanish. The second one is a changed hierarchy of the gender features which is motivated by the Germanic data in Section



How does this feature structure relate to the hierarchy of distinctions? Harley’s (1994) proposal, which I adopt, is to assume an interpretation of the feature hierarchy proposed in Avery & Rice (1989) for phonological features. In this system, the presence of a node depends on the presence of the dominating node, and only positive feature values may have dependents. Hence, e.g. the presence of the number feature [dual] depends on the presence of the dominating node [plural]. Given the Avery & Rice (1989) feature system, the feature structure proposed above implies the following markedness scales where the properties on the left are more marked than those on the left:

**Person:** 1. person inclusive > 2. person > 1. person > 3. person

**Number:** dual > plural > singular

**Gender:** feminine/neuter > masculine

### 2.2.2 Relative Markedness within a Paradigm

The hierarchy among the morphological distinctions also seems to play a role within a single language. Namely, the distinctions that are more rarely made crosslinguistically are, even in the languages where they exist, more marked than the more basic distinctions. The higher degree of markedness is exhibited by the fact that the marked distinctions are more frequently neutralized by homophony as the unmarked ones.

This tendency is observed in Bybee (1985) based on a statistical study of 20 unrelated languages. She also observes in addition that the phonological form of the most marked properties is usually more complex than that of the less marked forms. Both, homophony and phonological complexity are conflated in her notion of *dependent*. In Bybee’s (1985) Autonomy Principle, she takes this notion of dependency as the defining property of a paradigm.

- (9) **Autonomy Principle** A paradigm is a cluster of closely related words, in which one word is basic and the others “derived”. [...] The stronger forms are basic, the most autonomous, and the weaker forms are in a dependent relation to the basic form(s). Bybee (1985:124)

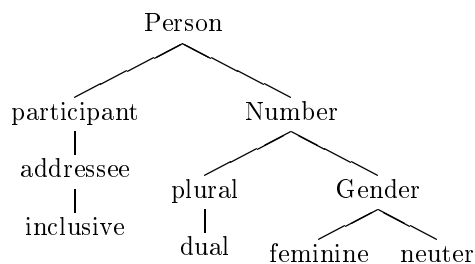
---

3.

Though Bybee’s principle is quite vague, the tendency she describes is a natural consequence of Harley’s (1994) feature hierarchy. As Harley points out, the feature hierarchy favors the erasure of the more marked distinctions over that of the less marked. In particular, I propose that the following two ways the feature hierarchy accomplishes this. On the one hand, it follows from the feature hierarchy, that the lexical insertion rule for underspecified items have to be underspecified for features low on the hierarchy, because underspecification for a feature implies underspecification for all dependent features. On the other hand, the feature hierarchy also governs the effect of a certain type of readjustment rules Distributed Morphology assumes; namely, impoverishment rules. Noyer (1992), Halle & Marantz (1993), and Harris (1994) argue that in some languages syntactic features are deleted prior to lexical insertion by impoverishment rules or filters. Where impoverishment applies, it will force insertion of less specified morphemes. Again, it follows from the feature hierarchy that impoverishment of a feature, forces deletion of all the features dependent on this feature.<sup>16</sup> In both cases, since both underspecification and impoverishment of a hierarchically higher feature implies underspecification or impoverishment of the dependent features, both processes will imply erasure of a more marked distinction; i.e. a distinction represented by a feature ranked lower.

Harley (1994) argues that the morphological properties – person, number and gender – itself exhibit a hierarchical structure. She points out following Bonet (1991) and Noyer (1992) that, like the distinctions within one class of properties, also the three properties we’re focusing on—gender, number, and person—obey a markedness hierarchy, both crosslinguistically and language-internally. Hence, Harley (1994) proposes the more elaborate feature hierarchy in (10) where the root node of Person dominates that of Number, which in turn dominates the root node of Gender. By adopting this hierarchy, the proposal above can account for the observed markedness hierarchy.

(10) Hierarchy of person, number, and gender features



<sup>16</sup>This is different from Harley’s (1994) proposal. She assumes that impoverishment is driven by filters against the cooccurrence of certain features; filters of the form \*[A B]. Furthermore, she states that when a filter applies, the delinked feature will be the feature dominated by more nodes in the feature geometry. The proposal in the text improves Harley’s proposal as it makes it unnecessary to stipulate that impoverishment is guided by the hierarchy, as this follows from the feature structure.



### 2.2.3 Position Class and Fusion

From what we saw so far, we should maybe expect that the lexical insertion rules could apply many times to the same syntactic material. If we had insertion rule  $[A] \rightarrow /ga/$ , we might expect that this rule may apply to  $[A]$  multiple times yielding an infinitely long output  $/gagaga\dots/$ . To block this, we adopt the natural assumption, that the application of an insertion rule deletes the features the rule spells out. But, underspecification seems to open another possibility for multiple spell-out: In the above example, the application of the rule  $[A] \rightarrow /ga/$  deletes the feature  $[A]$ . But, it should still be possible to apply a less specified insertion rule as e.g.  $[\ ] \rightarrow /va/$ . This would again generate an infinitely long output.

This problem arises in most morphological theories. In a pure early insertion model, nothing is built in to bar multiple affixation of features that are compatible. Within distributed morphology, Noyer (1992) and Halle & Marantz (1993) propose to adopt the descriptive notion of a morphological slot or position. On their account, each syntactic head corresponds roughly to one morphological slot and each morphological slot allows the insertion of only one morpheme into that position.

To my knowledge the first to abolish the notion of *position class* or *morphological position* is Anderson (1986). In a late insertion model, Anderson (1986) proposes the following rule ordering solution to prevent multiple application of the same insertion rule within his theory.

- (11) Rules may be organized (by stipulation) into disjunctive blocks, corresponding (roughly) to the traditional notion of *position class*. (Anderson 1986:3)

Evidently, it is conceptually desirable to eliminate a superfluous element from the theory such as the notion of ‘position class’. Anderson’s (1986) proposal however replaces position classes with the equally complex notion of a disjunctive rule blocks.<sup>17</sup> Since, in contrast to Anderson, we assume structure within syntactic heads, we can improve on his suggestion. Our solution to the problem of multiple application should be to extend the notion of discharge to all nodes of the morphosyntactic structure that lexical insertion applies to. Then, any rule inserting for example a gender morpheme will delete the gender node of the morphosyntactic structure, and thereby prevent the insertion of any further gender morpheme.<sup>18</sup> By generalizing the concept of discharge, we have success-

---

<sup>17</sup>There are differences between between Anderson’s (1986) proposal and the traditional notion of position class with respect to the interaction between stem alternation and affixation. These differences are however not at issue here.

<sup>18</sup>This solution would not work if there is a general default rule of the type  $[\ ] \rightarrow /va/$ . In all other cases, the lexical insertion rule will be specified for some feature, where we assume that the syntactic head may also be this feature. Let us assume that every insertion rule must be specified for at least one feature. Or, put differently, every lexical insertion rule must discharge some feature. In the case of ‘local’ default, the feature discharged might be the

fully eliminated the notion of position class in morphology, by relying on two assumptions, late insertion and the visibility of syntactic structure to lexical insertion.

As we eliminated the notion of position class in morphology, the interface between syntax and morphology has become more flexible and transparent. In fact, we expect a match between syntactic constituents and morphemes, because insertion rules can only apply to units that are constituents of the morphological feature hierarchy and the syntactic phrase structure. On the other hand, we expect to find cases where the insertion rules apply above the level of a syntactic head. Bobaljik (1995) shows that such cases indeed exist in domain of tense and agreement morphology of Germanic languages and are restricted by syntactic constituency. As I will show now, the restriction to syntactic constituency in connection with the feature hierarchy implies the condition in (12) from Wunderlich & Fabri (1994).

(12) **Fusion:** Only categories which are adjacent in the hierarchy [(13)] can be fused into one affix. So, for instance, person-number often amalgamate.

(13)  $\underbrace{\text{Status}}_C - \underbrace{\text{Person-Number-Gender}}_{\text{AgrS}} - \underbrace{\text{Mood}}_? - \underbrace{\text{Tense}}_T \underbrace{\text{Aspect}}_? - \underbrace{\text{Voice}}_{\text{in VP}} - \underbrace{\text{STEM}}_V$

Fusion here refers to cases where two properties that are in other contexts or languages expressed by two morphemes are expressed by means of only one morpheme. For example, Nunggubuyu as shown in (14-a) and Modern Hebrew as shown in (14-b) have separate morphemes for person, number, and gender (see the cited papers for arguments for the morpheme boundaries as given in (14)). In English and German in (14) Person, Number and Gender are fused into a single morpheme. (For German, the particular division into morphemes is argued in 3.3.)

(14) a. Nunggubuyu (Noyer 1991:205,(30))  
na w<sub>2</sub>V- ni- VERB-STEM  
2.Pers Plural masc

b. Modern Hebrew (Ritter 1993:800,(10))  
txun -i -ot  
feature fem Plural

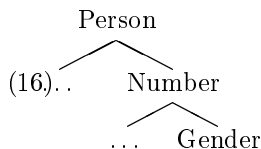
(15) a. English  
sleep -s  
stem- 3.Pers. singular, present tense

b. German  
Ein -e grün -e Wiese  
a fem. singular Nom. green fem. singular Nom. lawn

---

syntactic head.

In the case of person, number, and gender, condition (12) implies that person and gender cannot be fused, if number is expressed, independently, because person and gender aren't adjacent on the hierarchy, whereas fusion of number and gender as well as of person and number should be possible. This is also what our assumptions about feature structure and lexical insertions imply. The feature structure of person, number, and gender that Harley (1994) argues for is repeated in (16) from (10). The first predicted pattern of fusion, fusion of number and gender and separate expression of person, is derived in the following way: First insertion targets the number node, inserting a fused number-gender morpheme. This insertion deletes the number node and only leaves the gender node, which is the target of insertion in the second step. For the other predicted pattern of fusion of two properties, fusion of person and number, insertion first targets the gender node, deleting this node. In the second step, insertion targets the person node which at this point dominates only the number node. The unavailable pattern is indeed predicted to be impossible, because fusion of person and gender is only possible if insertion targets the person node, but this will also delete the number node. Hence, targeting the number node will cause fusion of all three properties.



#### 2.2.4 Morpheme Ordering

That the order of morphemes has roughly the same order across languages with rich inflection has been observed by many researchers (Bybee (1985), Baker (1992), among others). In particular, the order of affixation of nominal inflection usually conforms to the feature hierarchy of Harley (1994); the most marked properties are affixed closest to the stem. For the verbal inflection, Bybee (1985) finds the order in (17) to be the most frequent one. Noyer (1991) argues, this ordering restriction follows easily from one assumption about lexical insertion; namely the assumption that the strict cycle condition is observed by the insertion procedure.

(17) Person - Mood - Tense - Aspect - STEM

Noyer's (1991) proposal translates readily to our current assumptions. The particular interpretation of the strict cycle condition needed is given in (18).

(18) **Strict Cycle Condition** Lexical Insertion may target a node A only after it has been attempted to apply lexical insertion to all nodes dominated by A.

From (18) it follows straightforwardly that the most deeply embedded properties will be subject to lexical insertion first, and hence appear closest to the stem. In the following section, I will explore some new predictions that Noyer’s (1991) cyclicity proposal makes.

### 2.3 Cyclicity

Namely, the strict cycle condition might imply the effects of the two conditions (19) and (20) on paradigms Carstairs (1987) postulates. To understand these to claims I will offer translations of Carstairs’s (1987) terminology into that of Distributed Morphology. *Systematic homonymy*, in (19) means roughly cases of impoverishment. Carstairs (1987) distinguishes two types of *Systematic homonymy*: *syncretism* is impoverishment that is triggered by only the features of the slot it impoverishes; *Take-over*, on the other hand, is context-sensitive impoverishment – also triggered by features of other slots in the environment. However – and this is the interesting part – Carstairs (1987) claims in (19) that, impoverishment that is sensitive to an environment is restricted by relevance. The term *relevance* he adopts from Bybee (1985), who understands relevance in terms of the feature hierarchy. Essentially, Bybee (1985) defines *more relevant* as the item being closer to the stem being the more relevant.

- (19) **Systematic Homonymy Claim** All systematic homonymies within inflexional paradigms are either (a) syncretisms [...] or (b) take-overs in which relevance conflicts with dominance (i.e. the morphosyntactic context contains properties belonging to categories which are lower in the relevance hierarchy than the category to which the neutralised properties belong). (Carstairs 1987:123)

So, in essence, what (19) claims is that impoverishment may only be sensitive to properties that are realized further away from the stem. This is what we expect, if there is a morphological cycle: It will be impossible to make reference to a property after it is spelled out, given that lexical insertion deletes the features it applies to. Hence, if Carstairs’s (1987) claim (19) is correct, it directly supports the idea of a morphological cycle.

The peripherality condition in (20) applies to cases where the insertion of morphemes is sensitive to the morphosyntactic environment. (20) expresses the claim, that inward sensitivity of lexical entries at insertion may only be to non-syntactic features (*individual properties*) of morphemes, whereas outward sensitivity may only be to syntactic features. The non-syntactic features are the inflection class features of stems. If (20) is correct, it again supports the idea of a morphological cycle. We expect that the syntactic features of the morphemes closest to the stem are not accessible at the point when the morphemes further away from the stem are inserted, because insertion will have deleted the syntactic features of these morphemes. On the other hand, with the insertion of a morpheme, accompanying idiosyncratic features as inflection class features will

be inserted. Hence, the sensitivity to these idiosyncratic, non-syntactic features can only be exhibited with respect to morphemes that are inserted earlier than the morpheme that exhibits the sensitivity.

- (20) **Peripherality Condition** The realisation of a property P may be sensitive inwards, i.e. to a property realised more centrally in the word-form (that is, closer in linear sequence to the root), but not outwards to an individual property realised more peripherally (further from the root). The realisation of P may, however, be sensitive *to all the independently realised properties within a given category with which the realisation of P is not entirely simultaneous*. (Carstairs 1987:193)

### 2.3.1 Inflection Class Features

Two conditions on paradigms from the literature that make specifically reference to inflection class features are the No-Blur Principle of Carstairs-McCarthy (1994) in (21) and the Paradigm Economy Principle of Carstairs (1987) in (22). As Noyer (1994) argues, neither of these two principles provides definite evidence for the level of paradigms. In fact, Noyer (1994) shows that (21) follows from the assumption that a stem morpheme may have at most one inflection class feature, and that (22) could be implied by learnability considerations. Hence, the effects of both principles can be derived without assuming a level of paradigms.

- (21) **No-Blur Principle** Within any set of competing inflectional affixal realizations for the same paradigmatic cell, no more than one can fail to identify inflection class unambiguously. (Carstairs-McCarthy 1994:742)
- (22) **Paradigm Economy Principle** When in a given language L more than one inflexional realization is available for some bundle or bundles of non-lexically-determined morphosyntactic properties associated with some part of speech N, the number of macroparadigms for N is no greater than the number of distinct ‘rival’ macroinflexions available for that bundle which is most generously endowed with such rival realisations. (Carstairs 1987:50)

## 2.4 Local Homophony

In the preceding section, I have shown that a number of morphological generalizations that have been first formulated as applying to the level of paradigms, can be quite easily explained in terms of specific assumptions within the late insertion model, namely a morphological feature hierarchy and cyclicity of the insertion procedure. In doing so, I have uncritically adopted these generalizations from the literature, of which some were merely statistical generalizations over a certain array of languages (Bybee’s (1985) approach), counterexamples to others have been pointed out the literature (see Noyer’s (1994) critique of Carstairs (1987) and Carstairs-McCarthy (1994)) . In this section, I attempt

to justify the uncritical adoption of the generalizations. I will present examples which even in the most liberal predictive morphological system can only be explained by assuming two or more lexical entries for the same phonological string. Hence, homophony even among the affixes that are inserted in the same structural position must be possible. If this is so, there is little hope of finding hard morphological generalizations about universal restrictions on homophony, because the possibility of local homophony always makes exceptions possible.<sup>19</sup>

The claim I make here that we can prove that local homophony must be permitted, contrasts directly with the position taken by Halle (1994). To my knowledge, Halle (1994) first raises the question within a late insertion model whether it is possible to analyze every morphological paradigm as involving no homophonous affixes. He claims that this should be possible, and formulates that following principle barring local homophony:

- (23) **Local Homophony Prohibition** In a set of affixes competing for insertion in a given node all entries must be phonologically distinct. (Halle 1994)

Halle (1994) illustrates his point with the paradigm of adjectival inflection of an older dialect of German.<sup>20</sup> His analysis is based on more liberal assumptions about how lexical insertion takes place, than those I argued for above. Most importantly, he does not assume a hierarchical ordering of the features. For the following argument I adopt this less restricted framework, since showing that local homophony must be assumed in the less restricted system is a stronger claim than showing it for the more restricted system argued for above.

---

<sup>19</sup>Notice that the predictions of cyclicity are for a different reason not expected to be hard generalizations: The strict cycle condition makes predictions about sequences of morphemes. However, there are no criteria independent from morphological analysis for breaking up an affixed word into a string of morphemes. Hence, it is always possible to analyze the total affixation as just one affix and under such an analysis cyclicity doesn't apply.

<sup>20</sup>According to (Duden 1984), the paradigm Halle (1994) gives is that of 18th century High German. The present usage differs in the endings of the masculine and neuter singular in the genitive Case. Halle (1994) is unaware of this difference.

(24) 18th century High German, Adjective Inflection, cf. (Halle 1994:18)<sup>21</sup>

	+m,-f,-Pl	-m,-f,-Pl	-m,+f,-Pl	+Pl
+direct,-X,+strong	-r	-s	-e	-e
+direct,+X,+strong	-n	-s	-e	-e
-direct,-X,+strong	-s	-s	-r	-r
+direct,+X,+strong	-m	-m	-r	-n
+direct,-X,-strong	-e	-e	-e	-n
+direct,+X,-strong	-n	-e	-e	-n
-direct,-X,-strong	-n	-n	-n	-n
-direct,+X,-strong	-n	-n	-n	-n

Halle presents an analysis of (24) that obeys the Local Homophony Prohibition. His analysis assumes that first a number of impoverishment rules applies deleting features of the syntactic representation. Subsequently, the lexical insertion rules given in (26) apply.

- (25) Impoverishment:
- Delete [-Pl, +dir, +X] in the environment [\_\_\_\_\_, +direct, +X, +masc]
  - Delete [+Pl, Case] in the environment [\_\_\_\_\_, -strong, +Plural]
  - Delete [+Pl, -dir, +X]
  - Delete [-Pl, +dir] in env. [\_\_\_\_\_, +strong, +m, -AD]
- (26) Insertion Rules:
- [-Pl, +X, -direct, -f, +strong] → /m/
  - [-Pl, -f, +strong] → /s/
  - [+direct] → /e/
  - [+strong] → /r/
  - [\_] → /n/

But, look at the paradigms of adjective agreement in a the East Low German dialect of German in (27), which is spoken in the Berlin area. In this dialect the Case system has been reduced to only two distinct Cases – the nominative and the oblique Case like in English. Because it is prima facie evident what the syntactic features are that East Low German morphology expresses, I present the paradigm in (27) with descriptive labels for the rows and columns. The inflection patterns just like nominative and accusative Case in Standard German.

<sup>21</sup>On the nature of the features strong and weak, see Section 3. For now the reader is asked to accept this as one of the features that are present in the position of adjectival inflection. The other features Halle (1994) assumes are: For Case,  $\pm$ dir(ect) and  $\pm$ X where Nominative and Accusative share +direct, Nominative and Genitive share -X. And for Gender,  $\pm$ f(eminine) and  $\pm$ m(asculine), where neuter is -feminine, -masculine.

(27) East Low German, Adjective Inflection, Russ (1989:218)

	masculine	neuter	feminine	plural
Nom,strong	-a / -ǣ	-et	-e	-e
Obl,strong	-n	-et	-e	-e
Nom,weak	-e	-e	-e	-n
Obl,weak	-n	-e	-e	-n

This paradigm readily allows a morphological analysis which however violates the local homophony ban as shown in (28).

(28) Insertion Rules

$$\begin{aligned}
 [\text{masculine, Sg, Nom, strong}] &\longrightarrow /a/ \\
 [\text{neuter, Sg, strong}] &\longrightarrow /et/ \\
 [\text{Obl,masculine}] &\longrightarrow /n/ \\
 [+Pl,-strong] &\longrightarrow /n/ \\
 [-] &\longrightarrow /e/
 \end{aligned}$$

But, an analysis that doesn't violate the local homophony ban is impossible, unless we assume other processes, like redundant features or rules that map certain feature combinations onto other arbitrary combinations, that cripple the restrictiveness of the framework.

The problem the paradigm in (27) poses is to separate the affixes /e/ and /n/. Only one of them can be the default ending of adjectives, which is specified for no feature. However, we find that the affixes /n/ and /e/ both occur in + and - plural positions, + and - strong positions, + and - masculine positions, + and - feminine positions, and also + and - nominative positions. Since we only assume processes that let us ignore certain features for the purposes of lexical insertion, namely underspecification and impoverishment, if a morpheme occurs once in a position which has a feature and once in position that is specified for the negative value of that feature, this morpheme must be not specified for this feature. Hence, if we don't allow a multiple occurrence of either of /e/ and /n/, both of them have to be unspecified with respect to Gender, Case, Number, and the  $\pm$ strong distinction. But since there are no other distinctions active in this affix position this is a contradiction. This shows that the analysis of (27) forces us to assume local homophony.

We can formulate the theoretical prediction that arises in a system that bans local homophony and assumes only impoverishment and underspecification more abstractly as in (29).

(29) If two feature complexes in the same position and in the same syntactic environment get spelled out by the same phonological string, the lexical entry of this phonological string has to be unspecified with respect to all contrasting features of the two feature complexes.



We can think of this as an acquisition principle for morphology. In order to acquire the correct underspecification for a lexical entry, the learner looks at the complete paradigm and finds all occurrences of one affix.<sup>22</sup> After finding all the features specifications of each occurrence of this affix to determine the feature specification of the affix the learner just takes the intersection of all feature specification of all the affix-tokens he found in the paradigm. The step of deducing and adding the necessary impoverishment rules will in this case be purely mechanic. As an example for this algorithm, let us calculate the feature specification of the suffix /e/ in the 18th century High German adjective inflection shown in (24) using this algorithm. We find the following list of positions that /e/ may appear in:

$$\begin{array}{c}
 [-\text{masc}, +\text{fem}, -\text{Pl}, +\text{direct}, -\text{X}, +\text{strong}] \\
 [-\text{masc}, +\text{fem}, -\text{Pl}, +\text{direct}, +\text{X}, +\text{strong}] \\
 [+Pl, +\text{direct}, -\text{X}, +\text{strong}] \\
 [+Pl, +\text{direct}, +\text{X}, +\text{strong}] \\
 [+masc, -\text{fem}, -\text{Pl}, +\text{direct}, -\text{X}, -\text{strong}] \\
 [-\text{masc}, -\text{fem}, -\text{Pl}, +\text{direct}, -\text{X}, -\text{strong}] \\
 [-\text{masc}, +\text{fem}, -\text{Pl}, +\text{direct}, -\text{X}, -\text{strong}] \\
 [-\text{masc}, -\text{fem}, -\text{Pl}, +\text{direct}, +\text{X}, -\text{strong}] \\
 [-\text{masc}, +\text{fem}, -\text{Pl}, +\text{direct}, +\text{X}, -\text{strong}] \\
 \hline
 \text{Intersection } \cap: +\text{direct}
 \end{array}$$

Here we derived the right result: /e/ is in fact only specified for +direct.

What East Low German showed is that this acquisition principle isn't absolute. The learner may postulate homophony, if the above algorithm leads to a contradiction. The structure of the East Low German counterexample is the following: An inflectional paradigm that has two affixes which both have so many occurrences that for both of them the intersection of all their token-specifications is the empty set. This means that a learner who applies the above algorithm to figure out the feature specification of the two affixes, will arrive at the result that both affixes are the general default, specified for no relevant feature. This however is impossible, because one of the two items has to precede the other one. Two more, slightly different examples that fit this description come from the adjective inflection of two other Low German dialects given in (30) and (31).

---

<sup>22</sup>A reformulation of this algorithm as one where the learner need not already have remembered the whole paradigm is straightforward, since the only operation necessary for the success of the above algorithm is associative – namely intersection.

(30) Upper Saxon (Friedersdorf), adjective inflection, (Russ 1989)

	masculine	neuter	feminine	plural
Nom, strong	-er	-es	-e	-e
Obl, strong	-n	-es	-e	-n
Nom, weak	-e	-e	-e	-n
Obl, weak	-n	-e	-e	-n

(31) North Saxon, adjective inflection (Russ 1989:45)

	masculine	neuter	feminine	plural
Nom, strong	(-r/-n)	(-t)	-e	-e
Obl, strong	-n	(-t)	-e	-e
Nom, weak	-e	-e	-e	-n
Obl, weak	-n	-e	-e	-n

### 3 Strong and Weak Adjective Inflection in Germanic

In this section, I will present a novel observation about the agreement morphology within nominal phrases in Germanic and investigate its theoretical implications. In almost all Germanic languages attributive adjectives agree with their head noun in number and gender. In fact, two different kinds of adjective agreement, namely the so called weak and strong forms, occur of which depending on the determiner one must be used. The new insight that the account of this phenomenon developed below will try to capture is the following: The weak endings are in none of the Germanic languages independent from the strong endings, but the weak endings are always the least marked endings of the strong inflection. This suggests that there is no separate paradigm of weak endings and no feature [ $\pm$ weak]. I propose that the appearance of a weak paradigm is due to a process that deletes inflectional features in the cases where the weak endings appear. The deletion of features has the consequence that many distinctions disappear in the weak positions and only the least specified of the endings are inserted. To my knowledge, no previous account of the strong-weak contrast captured the fact that the endings of the weak forms are the least marked endings from the strong paradigm. As I will show below, this fact provides a an empirical argument against any early-insertion theory of morphology. It shows that deletion of morphosyntactic features can be triggered by the syntactic environment. But, on an paradigm based theory the choice of lexical items precedes syntax, and hence, cannot be affected by the syntactic environment.

The strong/weak contrast is found in the adjective inflection of most Germanic languages. In the following, I will look at the morphological aspects of the adjective inflection in Dutch, Norwegian, German, and Icelandic, which exhibit the crucial properties of the phenomenon in increasing complexity. I

show that the weak paradigm is derived from the strong paradigm via the deletion of syntactic features prior to lexical insertion. In section 3.5, I go on to show that, at least in German, the environment that triggers the weak inflection is purely morphosyntactic. The weak inflection is used, if the determiner heading the phrase the adjective appears in has an inflectional ending. Hence, the feature deletion rule that derives the weak inflection must apply after the determiner phrase has been constructed in the syntax. If morphology preceded syntax, such a rule is impossible because syntax first builds structure out of the lexical items that form its input (Chomsky 1994). Hence, the application of the deletion rule(s) that derive the weak paradigm and, by transitivity, insertion of the endings of the weak paradigm must follow syntax.

### 3.1 Dutch

For Dutch, the endings of the strong and weak adjective inflections are given in (32). In Dutch, case is not morphologically marked, and only two genders and number are distinguished. The suffix /e/ is clearly the default. As we see in (32) in the strong positions, / $\emptyset$ / is inserted for the specification [+neuter, -plural].<sup>23</sup>

(32) Dutch adjectival inflection

STRONG	-neuter	+neuter
-Plural	e	$\emptyset$
Plural	e	e

WEAK	-neuter	+neuter
-Plural	e	e
Plural	e	e

The lexical insertion rules for the Dutch adjectival inflection are given in (33).

(33)  $[-\text{plural}, +\text{neuter}] \rightarrow / \emptyset /$   
 $[-] \rightarrow / e /$

However, the difference between the weak and strong inflection remains yet to be accounted for. The weak and strong inflection differ only in the neuter singular suffix. In the weak inflection that default suffix /e/ takes over this position. I claim that it is not accidental that the default affix /e/ is the one that replaces / $\emptyset$ / in the weak paradigm, but it is a consequence of the impoverishment process applying. The straightforward analysis of these

<sup>23</sup>It is frequently claimed that zero affixation has a special status in morphology (Wunderlich & Fabri 1994, Carstairs-McCarthy 1994). In the adjective inflection in Dutch, / $\emptyset$ / acts as a completely normal suffix blocking affixation of the unspecified /e/-suffix. This shows that / $\emptyset$ / can be an affix just as any audible morpheme.

facts is that in Dutch weak positions the feature Gender is impoverished. If the strong and weak inflection are result of the same insertion rules, it follows that the default ending /e/ gets inserted instead of the more specific / $\emptyset$ / after impoverishment of gender. Note, that we could have impoverished for Number instead of Gender or both to get the same result. But the hierarchy of features in (10) where Gender is below Number, suggests gender impoverishment.

### 3.2 Norwegian

The Norwegian facts in (34) are quite similar to Dutch. In the weak inflection, no distinctions are made and only /e/, the default affix of the strong inflection, is used.

(34) Norwegian Adjectival Inflection

STRONG	-neuter	+neuter
-Plural	$\emptyset$	t
Plural	e	e

WEAK	-neuter	+neuter
-Plural	e	e
Plural	e	e

For the strong inflection, the lexical insertion rules we have to assume are the following.

$$(35) \quad \begin{array}{l} [-\text{plural}, +\text{neuter}] \rightarrow /t/ \\ [-\text{plural}, -\text{neuter}] \rightarrow / $\emptyset$ / \\ [-] \rightarrow /e/ \end{array}$$

Again, deletion of the Gender feature in weak environments will force obligatory insertion of the default /e/, because the other two suffixes are both specified for Gender.

### 3.3 German

Now let us look at the German paradigm more closely. The situation is more complex than in Dutch and Norwegian, because German has four distinct Cases and three grammatical Genders. In (36) we see the complete paradigm for the strong inflection. There is a total of five different endings. In the plural, no gender distinctions are made. /s/ and /m/ are quite clearly specified for neuter gender and dative Case respectively. The specification of /e/, /r/, and /n/ however is not that clear. According to the analysis of Halle (1994) presented in section 2.4, /n/ is the default adjectival agreement, /e/ is specified for direct

case, which is the feature shared by nominative and accusative, and /r/ is specified for [strong].<sup>24</sup>

(36) Modern German, strong adjective inflection

	masculine	neuter	feminine	plural
Nom, strong	r	s	e	e
Acc, strong	n	s	e	e
Gen, strong	n	n	r	r
Dat, strong	m	m	r	n

Compare (36) to the weak adjective inflection shown in (37). In contrast to Dutch and Norwegian, the German weak inflection uses two different endings: /e/ and /n/. But, like in Dutch and Norwegian, both of the endings that occur in the weak inflection also occur in the strong inflection; specifically, they are the two least marked ones of the strong inflection according to Halle's analysis. Notice furthermore, that for both, /e/ and /n/, if they occurred in the strong paradigm for a certain specification they also occur in the weak paradigm for that specification, except for the /e/ occurring in the nominative and accusative plural which are replaced by the least marked suffix /n/. This is evidence for the claim that the weak paradigm is derived from the strong paradigm via the deletion of features. This deletion widens the distribution of the default suffixes /e/ and /n/, whereas the more specified suffixes disappear in the weak inflection.

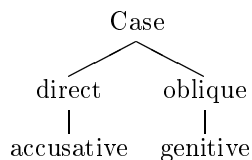
(37) Modern German, weak adjective inflection

	masculine	neuter	feminine	plural
Nom, weak	e	e	e	n
Acc, weak	n	e	e	n
Gen, weak	n	n	n	n
Dat, weak	n	n	n	n

For a detailed analysis of the German data, I adopt the feature hierarchy for Case in (38) from Harris (1994). Harris argues for this feature hierarchy with data from Romance languages, in particular Catalan. But, it seems to be suitable for German as well, as we can already see by looking at the weak paradigm in (37): In the neuter and feminine gender, the nominative and accusative pattern together and genitive and dative do, too.

<sup>24</sup>That Halle's (1994) analysis is based on the 18th century paradigm where the ending for masculine and neuter genitive singular were /s/ instead of /n/ doesn't affect the point here.

(38) Hierarchy of Case-features (Harris 1994)



Furthermore, it is an important aspect of the German adjectival inflection, that the strong endings are the same as the endings of the inflected determiners<sup>25</sup> use except for the genitive singular in the masculine and neuter gender. There, the endings of the determiners are /s/, which incidentally was the adjectival inflection until the 18th century (see 2.4). The similarity between adjective and determiner inflection is not surprising given that in most languages with concord in the DP we find that the endings of all three of determiner, adjective, and noun, are the same, e.g. in Latin. The complete paradigm of the inflection of the definite determiner in German is given in (39), which also shows the stem-vowel changes that are specific to the definite determiner.

(39) Inflection of the definite determiner in German

	masculine	neuter	feminine	plural
Nom, strong	de-r	da-s	di-e	di-e
Acc, strong	de-n	da-s	di-e	di-e
Gen, strong	de-s	de-s	de-r	de-r
Dat, strong	de-m	de-m	de-r	de-n

Since, the difference between the determiner inflection and the strong adjective inflection consists of replacing /s/ with the default ending /n/, it is natural to assume that the strong paradigm is related to the determiner inflection via a process of deletion of features. Specifically, deletion of the inflectional features in the genitive singular masculine and neuter. Then the complete analysis of the determiner and adjective inflection in German will consist out of one list of lexical insertion rules, general feature deletion rules, feature deletion rules that only apply to the adjectival inflection, and feature deletion rules that only apply to the adjectival if it is in a weak position.

Such an analysis is given in the following. The lexical insertion rules are given in (40).

---

<sup>25</sup>Determiners in German differ on whether they're inflected. As we'll see below this triggers the choice of a weak or strong ending on the adjective.

- (40)
- |                               |       |
|-------------------------------|-------|
| [+pl,+oblique,-genitive]      | → /n/ |
| [+masc, +direct, -accusative] | → /r/ |
| [+oblique, -genitive, -fem]   | → /m/ |
| [-fem]                        | → /s/ |
| [+oblique]                    | → /r/ |
| [+direct]                     | → /e/ |
| [—]                           | → /n/ |

These lexical entries yield the determiner inflection if we assume the general feature deletion rules in (41). The difference between the determiner inflection and the strong adjective inflection can be accounted for by the single deletion rule in (42).

- (41) Impoverishment rules applying to determiner and adjective inflection  
 delete Gender in the environment of +plural  
 delete Agr with [+masc,+direct,+accusative]
- (42) Impoverishment rule applying only to adjective inflection  
 delete Agr with [+oblique, -feminine]

This leaves the weak inflection to account for. In Dutch and Norwegian, deletion of gender accounted for the weak/strong difference. At first sight, the Gender distinction seems to be still present in the German weak declension, since in the accusative singular the endings of the genders differ. But actually, this difference is accounted for by the general impoverishment rule that deletes all inflectional features in the accusative singular masculine. So, we conclude that gender deletes in weak positions in German just like in Dutch and Norwegian. But in German, this isn't enough. In addition, most of the Case distinctions disappear in the weak inflection. The complete list of deletions that derive the weak paradigm in German is given in (43).

- (43) Impoverishment rules applying only in weak positions  
 delete [Gender]  
 delete [accusative]  
 delete [oblique]  
 delete [Case] in the environment of +plural

This concludes the analysis of the morphological aspects of the German adjective inflection. But in section 3.5, I'll discuss what the content of the descriptive term 'weak position' in German is, that characterizes the positions where the rules in (43) apply.

### 3.4 Icelandic

Now look at the adjectival agreement in Icelandic given in (44) and (45). Like German, Icelandic has three genders and four Cases. Hence, we assume again

that the hierarchy of the Case features is the one of Harris (1994) that was given in (38). In contrast to German, Icelandic draws gender distinctions in the plural of the strong inflection in (44), making the data slightly more complex. In addition, the adjectival agreement of Icelandic is interesting because it seems to have one suffix, /i/, that only occurs in the paradigm of weak inflection. This seems to contradict the analysis given for Dutch, Norwegian, and German, which predicts that the weak paradigm should use the least marked suffixes of the strong paradigm. What I will show in this section, is that the /i/ seems to be an isolated exception and that, /i/ aside, the Icelandic facts are amenable to the analysis proposed here.

(44) Icelandic strong adjectival (and definite determiner<sup>26</sup>) inflection:

	Singular			Plural		
	masc.	fem.	neut.	masc.	fem.	neut.
Nom	ur	∅	t	ir	ar	∅
Acc	an	a	t	a	ar	∅
Dat	um	ri	u	um	um	um
Gen	s	rar	s	ra	ra	ra

(45) Icelandic weak adjectival inflection

	Singular			Plural		
	masc.	fem.	neut.	masc.	fem.	neut.
Nom	i	a	a	u	u	u
Acc	a	u	a	u	u	u
Dat	a	u	a	u	u	u
Gen	a	u	a	u	u	u

To account for the problematic /i/ in the masculine singular nominative of the weak inflection, let us assume that in this case a lexical insertion rule is specified for a weak environment. This must be regarded as a highly marked, but not impossible option. In general it is ruled out by cyclicity, because impoverishment rules only affect a subtree, whereas insertion rules usually apply to the syntactic head node, blocking further insertion.

After this decision, the only other apparent problem is the Case distinction drawn in the feminine singular in the weak inflection, where otherwise no case distinctions are made. Namely, the /a/ ending occurring in the nominative case of the feminine singular. But, this correlates with appearance of

<sup>26</sup>The endings of the definite determiner differ in their phonology slightly from those given here in the table of the strong adjective inflection. However, adjectives like 'heiðinn' (heathen) use exactly the same endings as the definite determiner. Hence, I assume that the difference is only due to phonological processes.



the /ø/-suffix, which seems to be marked for direct Case, in this position in the strong inflection. Therefore, I assume that there is a general impoverishment rule applying to the feminine singular nominative, namely impoverishment of gender. Since, in the other Cases of the feminine singular in the weak paradigm the default agreement ending /u/ is inserted, there must be a different deletion rule applying to the feminine gender in weak environments. But, in the nominative Case, impoverishment of gender bleeds this impoverishment applying in the weak positions. In summary the rules that account for the Icelandic adjectival inflection are the following:

[sing, masc, Nom]	→ /i/ in weak positions
delete fem in fem singular nominative	
delete direct Case in fem Singular	
delete number in feminine in weak positions	
delete gender in weak positions	
delete Case in weak positions	
[sing, masc, direct Case]	→ /n/
[sing, fem, dative]	→ /ni/
[sing, fem, genitive]	→ /nar/
[sing, neut, dative]	→ /u/
[plural, masc, nominative]	→ /ir/
[plural, masc, accusative]	→ /a/
[plural, feminine, direct Case]	→ /ar/
[plural, genitive]	→ /ra/
[genitive]	→ /s/
[dative]	→ /um/
[direct Case]	→ /ð/
[singular]	→ /a/
[—]	→ /u/

This finishes the analysis of Icelandic. One might, though, reconsider the implications of the /i/-ending. Above, we analyzed /i/ as a case of lexical insertion into a syntactic head preceding impoverishment rules. But, since this contradicts the cyclicity claim of section 2.3. and /i/ is an isolated exception, one might consider a phonological treatment of /i/. Such a treatment would be to postulate an morphophonological readjustment rule that, in the environment of [Nom, sg, masc], maps /a/ to /i/.

### 3.5 Weak positions in German

In this section, I show that the positions where the weak inflection is used on the adjective is used, should be characterized by morphosyntactic properties. Namely, the presence of an inflectional ending on the determiner is what triggers

the application of the impoverishment rules leading to the weak inflection.<sup>27</sup>

On the first look German adjectives seem to actually have three different declension paradigms; namely one that is used with a definite determiner, one used with an indefinite determiner, and one that is used without a determiner. Compare the three columns in (46) which gives the masculine Singular forms of agreement for the four Cases of German. In the first column, the definite determiner ‘der’ triggers insertion of the weak ending. In the third column, without a determiner, only the strong ending appears. In the middle column, with the indefinite determiner, the strong ending is used in the nominative, whereas the weak ending is definitely used in the genitive. In accusative and dative case, the strong and weak ending are the same.

(46)

	def. Determiner	indef. Determiner	no Determiner
Nom	de-r gut-e Mann	ein gut-er Mann	gut-er Stoff
Acc	de-n gut-en Mann	ein-en gut-en Mann	gut-en Stoff
Dat	de-m gut-en Mann	ein-em gut-en Mann	gut-em Stoff
Gen	de-s gut-en Mann-es	ein-es gut-en Mann-es	gut-en Stoff-es
Gloss	the good man	a good man	good stuff

Duden (1984), a descriptive grammar of German, already points out that the endings in the middle column are predictable from the endings of the other two columns. The left column represents the pure ‘weak’ declension, the right column represents the pure ‘strong’ declension, and the middle column represents a mix of the two. The choice between the strong and weak ending in the middle column is determined by the morphology of the determiner. If the determiner has an overt agreement ending, the weak ending is chosen for the adjective. Otherwise, the strong ending is used on the adjective. Hence, in the middle column of (46), we find strong morphology in the nominative, and weak morphology in all the other cases. Also, in the other two columns the selection of weak or strong ending is based on whether the determiner shows overt agreement. In the right column, without a determiner, there is also no agreement and, consequently, the strong ending is always chosen. In the left column, the definite determiner is always inflected, and hence the adjective bears the weak ending in all cases. So, weak positions in German can be characterized as positions where the determiner heading the DP bears overt agreement morphology.

On my account, the weak/strong distinction is an arbitrary morphological property of German. A number of attempts have been made to reduce the weak/strong distinction to some independently argued for syntactic principle. In syntactic accounts of the strong/weak contrast (Olsen (1989), Penner &

<sup>27</sup>Eric Reuland (p.c.) pointed out to me that the facts in Dutch are essentially the same as in German. Namely, presence of an inflectional ending on the determiner triggers the insertion of the weak ending.

Schönenberger (1992), Kester (1993)), the phonological content of the endings is ignored. These accounts have to postulate a fundamental difference between the weak and the strong endings, that makes it possible to distinguish them in the syntax. I however, in 3.3 showed that a feature  $[\pm\text{strong}]$  isn't necessary for the morphology and, in fact, argued against by the overt morphology. If there is also no semantic argument for a feature  $[\pm\text{strong}]$ , this undermines the central assumption of the syntactic accounts.

The data in (46) already proves that the weak/strong distinction has no semantic import. Namely, there is no difference in interpretation between the indefinite NP in (46) in the nominative and genitive Case, though one has a strong adjectival ending and the other one a weak ending. This point is supported by the existence of three determiners which can optionally take an inflectional ending, namely *manch* (some) shown in (47), *solch* (such), and *welch* (which). In no case, has the choice of inflectional marking any semantic import.<sup>28</sup>

	masc. singular	masc. singular
(47) Nom.	manch gut-er Beamt-er	manch-er gut-e Beamt-e
Acc.	manch gut-en Beamt-en	manch-en gut-en Beamt-en
Dat.	manch gut-em Beamt-em	manch-em gut-en Beamt-en
Gen.	manch gut-en Beamt-en(s)	manch-es gut-en Beamt-en

### 3.6 Conclusion

In the section 3.1 to 3.4, we saw that morphologically the weak paradigm of the adjectival inflection in the Germanic languages is derived from the strong paradigm. The process that derives the weak paradigm deletes selected syntactic features of the adjectival inflection prior to insertion of the phonological endings. In 3.5, we saw the these deletion rules apply in German to an adjectival inflection, if the determiner that heads the nominal phrase the adjective is contained in bears an overt inflectional ending. In this section, I will demonstrate that the facts of the preceding five sections constitute an empirical argument of a novel kind in favor of late insertion.

Halle & Marantz (1994) pointed out that the mere existence of rules deleting features argues against certain versions of a lexicalist theory. They argue that, in a lexicalist theory where morphemes are combined prior to syntax, impoverishment rules cannot apply in a way that would affect the selection of morphemes. This is indeed the case for a theory where all that is done is the concatenation of morphemes. However, as I showed in section 1, a lexicalist theory must assume a level of paradigms to interface the underspecified morphological outputs with syntax, which requires full specification for the syntactic features. Once the level of paradigms is postulated, the argument of Halle & Marantz

<sup>28</sup>The only difference between the two uses of e.g. *manch* is that the uninflected form is in a little more formal register, but most speakers use both forms in fairly free alternation.

(1994) doesn't go through anymore, because impoverishment rules could apply to the cells of a paradigm before the paradigm is filled with the inflected forms.

The argument based on the weak/strong contrast is stronger because, as shown in 3.5, impoverishment in this case is triggered by the morphosyntactic environment. This means that the question whether the weak or strong ending is used in a position, is triggered by morphological properties of syntactic heads other than the adjective in question, namely the determiner heading the DP the adjective is part of. If this is the case, the effect of impoverishment cannot be achieved by means of processes taking place on the level of paradigms of the lexicalist theory. The reason is that at the point of the derivation where the paradigm is constructed the information about the syntactic environment will not be accessible. Hence, the weak/strong contrast provides a stronger empirical argument against a lexicalist theory than the cases Halle & Marantz (1994) discuss.

### References

- ANDERSON, STEPHEN R. 1986. Disjunctive ordering in inflectional morphology. *Natural Language and Linguistic Theory* 4.1–31.
- AVERY, PETER, & KAREN RICE. 1989. Constraining underspecification. In *Proceedings of NELS 19*, 1–15, Amherst. GLSA.
- BAKER, MARK C. 1992. Morphological classes and grammatical organization. In *Yearbook of Morphology 1991*, ed. by Geert Booij & Jaap van Marle, 89–106. Dordrecht: Kluwer.
- BOBALJIK, JONATHAN D. 1995. The morphological grounding of the Spec(TP)-parameter. MIT ms.
- BONET, EULALIA. 1991. *Morphology after Syntax: Pronominal Clitics in Romance languages*. Cambridge: Massachusetts Institute of Technology dissertation.
- BYBEE, JOAN L. 1985. *Morphology*. Amsterdam: John Benjamins.
- CARSTAIRS, ANDREW. 1987. *Allomorphy in Inflection*. London: Croom Helm.
- . 1994. Inflection classes, gender and the principle of contrast. *Language* 70.737–788.
- CHOMSKY, NOAM. 1994. Bare phrase structure. Occasional Papers in Linguistics 5, Massachusetts Institute of Technology, Cambridge.
- . 1995. Chapter four: Categories and transformations. MIT ms.
- DUDEN. 1984. *Die Grammatik*. Frankfurt: Brockhaus, fourth edition.
- DYŁA, STEFAN. 1984. Across-the-board dependencies and case in polish. *Linguistic Inquiry* 15.701–705.
- FRANKS, STEVEN. 1994. On parallelism in across-the-board dependencies. *Linguistic Inquiry* 24.509–529.
- GROOS, ANNEKE, & HENK VAN RIEMSDIJK. 1981. Matching effect in free relatives: A parameter of core grammar. In *The Theory of Markedness in Generative Grammar: Proceedings of the 1979 GLOW Conference*, ed.

- by Adriana Belletti, Luciana Brandi, & Luigi Rizzi, 171–216. Pisa: Scuola Normale Superiore di Pisa.
- HALLE, MORRIS. 1994. Distributed morphology and the inflection of words. MIT ms.
- , & ALEC MARANTZ. 1993. Distributed morphology. In *The View from Building 20: Essays in Linguistics in Honor of Sylvain Bromberger*, ed. by Ken Hale & Samuel Jay Keyser, chapter 3, 111–176. MIT-Press.
- , & —. 1994. Some key features of distributed morphology. In *Papers on Phonology and Morphology*. MITWPL. Talk given at the 1994 LSA-Meeting in Boston.
- HARLEY, HEIDI. 1994. Hug a tree: Deriving the morphosyntactic feature hierarchy. In *Papers on Phonology and Morphology*, 289–320. Cambridge: MITWPL.
- HARRIS, JAMES. 1994. The syntax-phonology mapping in Catalan and Spanish clitics. In *Papers on Phonology and Morphology*, 321–353. Cambridge: MITWPL.
- JAKOBSON, ROMAN. 1971 (1936). Beitrag zur allgemeinen Kasuslehre: Gesamtbedeutungen der russischen Kasus. In *Selected Writings II*, 23–71. The Hague: Mouton.
- JESPERSEN, OTTO. 1927. *The Philosophy of Grammar*. Chicago: University of Chicago Press, (1992 reprint) edition.
- KARTTUNEN, LAURI, & ANNIE ZAENEN. 1984. Matching. In *Proceedings of ESCOL '84*, 309–320, Ithaca. Cornell WPL.
- KESTER, ELLEN-PETRA. 1993. The inflectional properties of Scandinavian adjectives. *Studia Linguistica* 47.139–153.
- KIPARSKY, PAUL. 1983. Word-formation and the lexicon. In *Proceedings of the 1982 Mid-America Linguistics Conference*, ed. by F. Ingemann, Lawrence. University of Kansas.
- NOYER, ROLF. 1991. The mirror principle revisited: Verbal morphology in Maung and Nunggubuyu. In *Proceedings of SCIL 3, MITWPL 14*, ed. by Jonathan Bobaljik & Tony Bures, 195–209, Cambridge. MITWPL.
- . 1992. *Features, Positions and Affixes in Autonomous Morphological Structure*. Cambridge: Massachusetts Institute of Technology dissertation.
- . 1994. Paradigm structure constraints and lexical generative capacity. In *Proceedings of NELS 24*, ed. by Mercè González, 427–441, Amherst. GLSA.
- OLSEN, SUSAN. 1989. AGR(eement) in the German noun phrase. In *Syntactic Phrase Structure Phenomena in Noun Phrases and Sentences*, ed. by Christa Bhatt, Elisabeth Löbel, & Claudia Schmidt, 39–49. Amsterdam: John Benjamins.
- PENNER, ZWI, & MANUELA SCHÖNENBERGER. 1992. The distribution of nominal agreement features in Swiss German dialects and the strong DP/CP parallelism hypothesis. Université de Geneve, Ms.
- PLANK, FRANS. 1991. Rasmus Rask's dilemma. In *Paradigms: The Economy of Inflection*, ed. by Frans Plank, 161–196. Berlin: Mouton de Gruyter.

- RITTER, ELIZABETH. 1993. Where's gender? *Linguistic Inquiry* 24.795–803.
- RUSS, CHARLES V.J. 1989. *The Dialects of Modern German: A Linguistic Survey*. Stanford University Press.
- TARALDSEN, KNUT TARALD. 1981. Case-conflict in Norwegian topicalization. In *Proceedings of NELS 11*, ed. by Victoria Burke & James Pustejovsky, 377–398, Amherst. GLSA.
- WUNDERLICH, DIETER, & RAY FABRI. 1994. Minimalist morphology. Universität Düsseldorf ms.
- WURZEL, WOLFGANG. 1989. *Inflectional Morphology and Naturalness*. Dordrecht: Reidel.