THREE PERSPECTIVES
OF DETERMINER AGREEMENT IN GERMAN

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1. Introduction

In German, the constituents of a simple noun phrase are articles, possessive pronouns, adjectives and nouns. The noun phrase must be comprised of at least one of these elements and most combinations of them are possible. Most constituents of noun phrases are inflected for the features case, number, gender and declension. Case, number and gender features are common to all constituents (although gender is, in most cases, inherent in nouns) while it is only adjectives and nouns that inflect for declension. However, when an adjective follows a noun the adjective occurs in an uninflected or stem form.

Agreement between the noun phrase's constituents can be quite complex. Gender[1] and number are characteristics of the noun and any constituents, which attach to it, must agree with the noun's gender and number features. In the case of possessive pronouns the inherent feature values are suppressed in favour of the noun's feature values. Case features are the characteristic of the noun phrase as case in German accounts for grammatical functions and are, therefore, integral to syntactic agreement. The noun phrase is feature marked for case by its role within the phrase and this feature must be shared between all the noun phrase's elements (although only a few nouns actually inflect for this feature). The complexity of agreement lies in the distribution of the declension feature.

The values of the declension features are weak, strong and mixed. The strong value occurs in cases where a noun phrase consists of only an inflected noun or substantival adjective, an articleless or uninflected indefinite article[2] noun phrase in which all constituents must share this feature or in the case of post-demonstrative possessives, which can be marked both strong and weak. The weak declension value is evident in all constituents following an inflected definite article.

This distribution of features creates quite a challenge for theories attempting to provide a generalisation of German noun phrase internal agreement. In this paper I examine three variations of the theory Head-Driven Phrase Structure Grammar which attempt to account for the distribution of agreement features in German. Klaus Netter (1994) discusses noun phrase internal agreement under the assumption of a functional head in his paper 'Towards a Theory of Functional Heads in German Nominal Phrases'. In contrast to this assumption, Carl Pollard and Ivan Sag (1994) and Andreas Kathol (1994) attempt to generalise these phenomena in terms of a noun as the head of a nominal phrase in *Head-Driven Phrase Structure Grammar* and 'On Agreement in HPSG' respectively.

The organisation of the paper will be as follows: I will first present a sample of the data discussed followed by a brief discussion of the three author's interpretations of such. Considering how their analyses account for simple determiner phrases I will attempt to provide as much of a comparison as possible between their respective approaches. The conclusion will comprise of a critique of how well these data are accounted for and a brief discussion of areas of further research.

2. German Noun Phrases

Although adjectives, pronouns, possessive pronouns and possessives can be elements of a noun phrase, in this paper I will be primarily concerned with the simple German noun phrase consisting of a determiner (including

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[1] German is a grammatical gender language.
[2] This includes numerals such as *zwei* 'two'.

numerals), and noun. As I have mentioned previously these elements are optional with the restriction of at least one must be present to comprise a noun phrase.

The article, which precedes the noun in these constructions, can be either a definite article or an indefinite or numeral type article. Both articles exhibit morphological inflection for case, gender, and number, see Appendix A. Specific numerals such as *zwei* 'two' do not inflect. The noun with which the article combines has inherent gender and can inflect for number and case, see Appendix B. It has been noted by Pollard and Sag (1994:372 ref.: Kathol-personal communication 1991) and Netter (1994:325) however, that there are a handful of nouns that also inflect for declension. They suggest that these nouns inflect similarly to adjectives. However, in most dictionaries these nouns[3] such as *Verwandte* have a double lexical entry: one, which is a standard noun, showing inflection for the case and plurality (Messinger 1973:585):

| *Verwandte* (+n genitive), (+en plural) | '(fem.) relative' |
| *Verwander* (+n genitive), (+en plural) | '(masc.) relative' |

and another which is an adjective: *verwandt* 'related to'.

I propose that these few nouns are actually members of a large class of nominals called substantival adjectives. According to Hammer (1983:54) "all adjectives ... can be used as nouns". In addition, it is noted that for the most part substantival adjectives are capitalised indicating a noun in German orthography and are inflected as if they were followed by *Mann* 'man', *Frau* 'woman' or *Element* 'element' (neuter) depending on their respective referent. A feature that sets the substantival adjective apart from a standard noun is the fact that it shows inflection for declension (see Appendix C). Given this fact, the inventory of these select few nouns that inflect for declension has increased by the total adjective inventory in the lexicon.

When combining an article with a noun the three features, case, gender and number must agree between the two constituents, see for example the following:

1	$des_{(gen)}$ $Buches_{(gen)}$	'of the book'	$*des_{(gen)}$ $Buch_{(nom/acc/dat)}$
2	$die_{(fem)}$ $Frau_{(fem)}$	'the woman'	$*der_{(masc)}$ $Frau_{(fem)}$
3	$die_{(plur)}$ $Bäume_{(plur)}$	'the trees'	$*der_{(sing)}$ $Bäume_{(plur)}$

However, declension being either weak, strong or mixed is not considered an agreement feature of an article. Instead, the form of declension of a following constituent is determined by the article preceding it, therefore a governing relation exists. Indefinite articles govern the mixed declension class. This class assumes a strong declension value for all nominative and feminine and neuter accusative forms; all other forms show a weak declension value. In efforts of simplification, all three authors dispense with this third declension feature opting instead for a binary approach of either weak or strong declension values (Pollard & Sag 1994:66, Netter 1994:324 and Kathol 1994:24,25). I will then present the data in this binary manner. Note that standard nouns (*Buch*) fail to show the inflection for declension:

1	ein $Buch_{(strong,nom)}$	'a book'	$*ein$ $Buch_{(weak,nom)}$
2	ein $Kluges_{(strong,nom)}$	'a clever (one)'	$*ein$ $Kluge_{(weak,nom)}$
3	$eine$ $Kluge_{(strong,nom)}$	'a clever (woman)'	$*eine$ $Kluge_{(weak.nom)}$
4	ein $Kluger_{(strong,nom)}$	'a clever (man)'	$*ein$ $Kluge_{(weak,nom)}$
5	$einem$ $Buch_{(weak,dat)}$	'to a book'	$*einem$ $Buch_{(strong,dat)}$
6	$einem$ $Klugen_{(weak,,dat)}$	'to a clever (one)'	$*einem$ $Klugem_{(strong,dat)}$
7	$einer$ $Klugen_{(weak,dat)}$	'to a clever (woman)'	$*einer$ $Kluger_{(strong,dat)}$
8	$einem$ $Klugen_{(weak,dat)}$	'to a clever (man)'	$*einem$ $Klugem_{(strong,dat)}$

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[3] This is with the exception of the noun $Beamter_{masc}$ *(Beamtin*$_{fem}$*)* 'official' which has only a standard noun listing. However, as a standard noun it exhibits only a genitive and plural inflection according to Messinger (1973:85).

Cardinal numbers (with the exception of *ein* 'one'), such as *zwei* 'two' can also act as an article[4] which governs for a strong constituent, for example: *zwei Kluge*(strong) 'two clever (women)'. Definite articles govern the weak declension class:

1	*das Buch*(weak)	'the book'	**das Buch*(strong)
2	*das Kluge*(weak)	'the clever (one)'	**das Kluges*(strong)
3	*die Kluge*(weak)	'the clever (woman)'	**die Kluge*(strong)
4	*der Kluge*(weak)	'the clever (man)'	**der Kluger*(strong)

As we have seen in the examples, the constituents that can follow a determiner in a simple determiner construction can either be a standard noun, such as *Buch* or a substantive adjective, such as *Kluger*. These nouns will be marked for either strong or weak declension dependent on the article preceding.

These data bring forward some key agreement issues in German: the features, case, gender and number must agree between all constituents of the noun phrase which bear inflectional morphology. The agreement features of the adjective and the noun must be identical including the declension value. Perhaps, the most challenging aspect brought to light is accounting for the distribution of the declension feature, particularly in the absence of a governing article.

3. Three Perspectives

In this section we will consider the three approaches to the previously discussed agreement issues within the German noun phrase. While the basic agreement tools of HPSG, such as structure sharing are employed in each account, they differ in the basic assumptions of what constituent is the head of the noun phrase and also, in the principles and constraints they employ. These distinctions have interesting effects on their ability to account for the data.

The two key issues in accounting for agreement in a determiner phrase are first, that the agreement features case, gender and number agree between the determiner and the noun and second, that articles showing strong inflection (definite articles and non-nominative, and non-feminine/neuter accusative indefinite articles) choose a weakly declined noun and the remainder of indefinite articles and cardinals (with the exception of *ein*) which are weakly inflected choose a noun with strong declension.

3.1 The Noun as Head

Pollard and Sag and Kathol both assume that the head of the noun phrase in German is the noun and the noun in this role selects the appropriate article for itself. However, both approaches rely on a reciprocal selection of the noun by the article to ensure agreement

3.1.1 Pollard & Sag's Account

On Pollard and Sag's account articles do not bear a value for declension, rather they exhibit a head feature called DTYPE which describes either a strongly or weakly inflected article (1994:66). The strongly inflected article, such as *das* specifies for the weak declension value in constituents to follow and the weakly inflected one, such as

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[4] One could suggest that the cardinal number, *zwei* is acting like an article. However, if this were the case it would govern for the strong declension class in the constituents following which generates an ungrammatical phrase as we have seen previously: **die zwei letzte*(strong) *Kluge*(strong).Therefore, it seems reasonable to assume that cardinals modifying nouns act like uninflected adjectives which may either bear agreement features or transfer the declension feature to the constituents which follow.

ein selects the strong declension value. The lexical entry of the noun identifies the article with which it can adjoin by means of this DTYPE feature, as for example in the truncated lexical entry for *Kluge* which governs a strongly inflected determiner.

Figure 1

$$\left[\text{SYNSEM}_{Kluge} \left[\text{LOC} \left[\text{CAT} \left[\text{SPR} \langle \text{DETP}_{strong} \rangle \right] \right] \right] \right]$$

The identification of the strong article occurs *viz.* specification of a valence feature SPR, the value of which stipulates what other signs this noun's lexical entry must combine with in order to be considered saturated, ensured by the Valence Principle (1994:348). The actual selection of the determiner by the noun is guaranteed by the Head Specifier Schema which accounts for the local selection of a non-head specifier phrase by the noun head (1994:362). In addition, this selection is considered obligatory in the case of weakly inflected attributive adjectives to prevent them from forming an ungrammatical noun phrase (1994:373), i.e. **Kluge* (weak).

Resembling a head of the phrase, the article, like a marker, selects the type of noun that it marks by means of the head feature SPEC. This identifies the correct form of the noun required through SPEC's value. The SPEC Principle maintains that this specified value is token-identical to the SYNSEM value of the noun (1994:51). The obvious value for SPEC to ensure the appropriate declension distribution for the noun *Kluge* would be a strong declension value. However, the feature DECL [ension] was not available in Pollard and Sag's earlier account of German internal noun phrase agreement. It arose from the realisation that declension is a property of the noun and consequently, the article governs this value (1994:373). Therefore, the SPEC feature of articles is marked for the appropriately governed declension value either weak or strong (1994:372). Therefore, the correct article for the noun *Kluge* would need to bear the feature DECL strong as in the following truncated lexical entry of the article *das*.

Figure 2

$$\left[\text{SYNSEM}_{das} \left[\text{LOC} \left[\text{CAT} \left[\text{HEAD} \left[\text{SPEC} : \text{N'} \left[\text{DECL}_{strong} \right] \right] \right] \right] \right] \right]$$

The result of this reciprocal specification of the article and the noun is the appropriate combination of a show inflection) such as *Buch*, it is not clear on Pollard and Sag's account how these nouns are specified for by the article. They acknowledge that these nouns exhibit an unspecified value for declension (1994:373). To ensure that these nouns are available for reciprocal selection by the article, the article's SPEC value would need to be disjunctively marked for the correct declension value or an unspecified value, as in figure (3).

Figure 3

$$\left[\text{SYNSEM}_{das} \left[\text{LOC} \left[\text{CAT} \left[\text{HEAD} \left[\text{SPEC} : \text{N'} \left[\text{DECL}_{strong} \vee \left[\quad \right] \right] \right] \right] \right] \right] \right]$$

Therefore, an unspecified noun will correctly combine with its article.

In addition to correct government of the article and the correct selection of the declension value, the agreement values gender, case and number must agree between the article and the noun in the determiner phrase. Pollard and Sag divide these features into two categories, syntactic which includes CASE as a HEAD feature and semantic which includes GEND [er][5] and NUM [ber] as CONTENT features (1994:88).

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[5] As German is a grammatical gender language, there are no anchoring restrictions on this feature (Pollard & Sag 1994:88)

Case concord is a form of syntactic agreement which Pollard and Sag distinguish from index agreement. Language-specific constraints require structure sharing between a noun's CASE value and that of a determiner or adjective that is dependent on the noun. Given that agreement occurs between co-indexed elements with differing case values (antecedent pronoun relationships for example) index agreement and case concord are distinct (1994:88).

On Pollard and Sag's account, case concord is a consequence of lexically specified identities. Considering a noun such as *Kluge*, the CASE value would be nominative in a nominative noun phrase by virtue of the Head Feature Principle which ensures that the SYNSEM values of the phrase and its head daughter are token-identical (1994:34). The CASE value for the article is co-indexed with the CASE value of the noun thereby ensuring case agreement between them through structure sharing. Number and gender are properties of the noun whose attribute INDEX specifies the values for NUM singular and GEND neuter which are in turn co-indexed with the article to ensure agreement of number and gender between the noun and the article. These values are percolated up to the phrase level by means of the Semantics Principle which maintains that the CONTENT values of the phrase and its head daughter are identical (1994:48). Structure sharing, then, ensures that only an article and a noun with identical values for case, gender and number will combine, such as in the following example of *das Kluge*.

Figure 4

$$
\mathbf{H} \\
\begin{bmatrix} \text{CAT} \begin{bmatrix} \text{HEAD1} \\ \text{SUBCAT}\langle\ \rangle \end{bmatrix} \\ \text{CONT2} \end{bmatrix}
$$

$$
\mathbf{C} \\
\begin{bmatrix} \text{CAT} \begin{bmatrix} \text{HEAD} \begin{bmatrix} \text{SPEC}: \text{N'}[\text{DECL}_{weak}] \\ \text{CASE}_{nom} \\ \text{DETP}_{strong} \end{bmatrix} \end{bmatrix} \\ \text{CONT} \begin{bmatrix} \text{INDEX} \begin{bmatrix} \text{NUM}_{plur} \\ \text{GEND}_{neut} \end{bmatrix} \end{bmatrix} \end{bmatrix}
$$
das

$$
\mathbf{H} \\
\begin{bmatrix} \text{CAT} \begin{bmatrix} \text{HEAD1} \begin{bmatrix} \text{DECL}_{weak} \\ \text{CASE}_{nom} \end{bmatrix} \\ \text{SPR}\langle\text{DETP}_{strong}\rangle \end{bmatrix} \\ \text{CONT2} \begin{bmatrix} \text{INDEX} \begin{bmatrix} \text{NUM}_{plur} \\ \text{GEND}_{neut} \end{bmatrix} \end{bmatrix} \end{bmatrix}
$$
Kluge

Pollard and Sag do not address the issue of cardinals acting as either articles or adjectives. However, Netter (1994:335) suggests that their account could not explain this distribution without assuming that in both cases the cardinal carries some form of weak declension value. His argument rests on considering that a cardinal such as *zwei* in a determiner position takes the declension value as unspecified or strong (1994:334). However, there appears to be no evidence for this assumption. As we have seen previously, an adjective and/or noun following the cardinal must be strongly declined, the cardinal then acts more like a weakly inflected article, i.e. *zwei letzte* (strong) *Kluge* (strong). If it were strongly declined it would govern for a weak adjective and noun, i.e. *zwei letzten* (weak) *Klugen* (weak). Therefore, as an article *zwei* appears to carry some type of marker for weak declension. In adjectival usage the cardinal will always be within a weakly declined N', as it will always be preceded by a strongly inflected article.
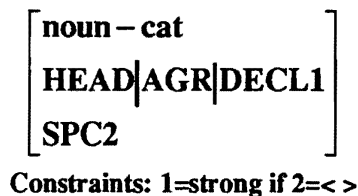
It appears, then, that it is reasonable to assume that the cardinal as both an article and an adjective does carry some form of weak declension value. Therefore, Pollard and Sag's approach is able to account for this distribution with the addition of a dual lexical entry for *zwei*, one as an article and another as an adjective. In both the article's and the adjective's lexical entry the head feature would have a weak value, DETP weak and MOD weak respectively.

Pollard and Sag's approach can account for government and correct nominal declension within determiner phrases by means of reciprocal specification of constituents through the marking for the article being a DETP type and the noun being a declension value. However, disjunctive specification of the noun may be necessary to ensure that undeclined nouns are available for selection. The phrase itself is licensed by the Valence Principle and the Head Specifier Schema, while the SPEC principle ensures declension agreement between the constituents as does structure sharing of syntactic and semantic agreement features.

3.1.2 Kathol's Account

Much of Kathol's account of determiner phrases is based upon Pollard and Sag's approach. The noun as head of the phrase selects its article by means of a feature for specification; here SPC is the equivalent of SPR in Pollard and Sag's approach. The declension value of the noun, which is applicable to all nouns including substantival adjectives, is identified as a head feature, AGR in the lexical entry. However, in the case of nouns such as *Buch* which do not inflect for declension, the declension information in their HEAD|AGR feature would need to be disjunctive as the noun can either be strongly inflected such as in *ein Buch* (strong) or weakly inflected as in *das Buch* (weak). Kathol states that absence of these declension values is due to the morphology and does not offer any further account (1994:27). A constraint applies to all nouns, which defines weak as the default declension value if the noun has value for SPC (including both definite articles and indefinite articles), as illustrated in the following figure (1994:25).
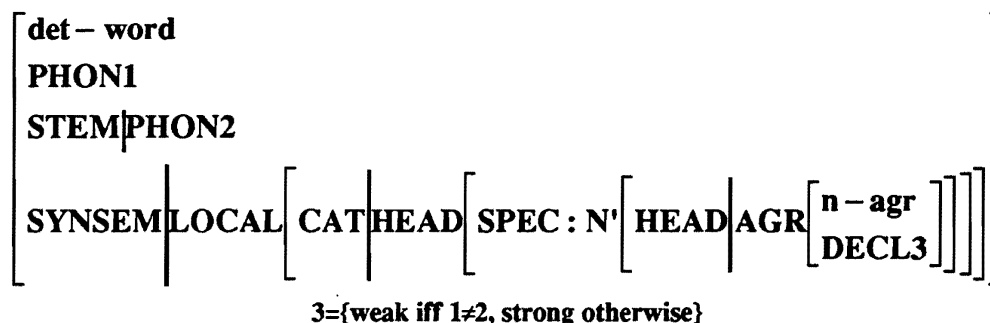
Figure 5

$$\begin{bmatrix} \text{noun} - \text{cat} \\ \text{HEAD|AGR|DECL1} \\ \text{SPC2} \end{bmatrix}$$

Constraints: 1=strong if 2=< >

Therefore, in the case of the substantival adjective, *Kluge* the SPC value would be a determiner, which could be either a definite or indefinite article, and the declension value of the noun weak satisfying the constraint. The Valence Principle and the Head Specifier Schema ensure that the noun can combine with its chosen article.

As in Pollard and Sag's account, the article selects its noun and does not bear a declension value. However, it is not typed as being strong or weak as we have seen in their account. Instead, Kathol appeals to the morphology of the article to ensure appropriate government by the noun. The article's PHON value is compared with the value of the article's STEM|PHON value to determine the declension value of the governed noun. A strongly inflected article will exhibit a difference in values, such as *einem* in which *-em* is the distinction between the stem and the realised article. On the other hand, *ein* shows no distinction between the two values just as the cardinal *zwei*, which Kathol considers a determiner variant (1994:26). A constraint is placed on all articles such that distinction between the stem and the article will ensure the article selects a weakly declined noun and no distinction between them will trigger a strong selection, i.e. as in figure (6) (1994:26).
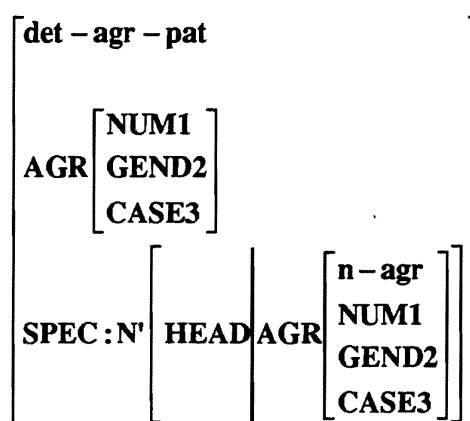
Figure 6

$$
\begin{bmatrix}
\textbf{det} - \textbf{word} \\
\textbf{PHON1} \\
\textbf{STEM} \textbf{PHON2} \\
\textbf{SYNSEM} \begin{bmatrix} \textbf{LOCAL} \begin{bmatrix} \textbf{CAT} \begin{bmatrix} \textbf{HEAD} \begin{bmatrix} \textbf{SPEC} : \textbf{N'} \begin{bmatrix} \textbf{HEAD} \begin{bmatrix} \textbf{AGR} \begin{bmatrix} \textbf{n} - \textbf{agr} \\ \textbf{DECL3} \end{bmatrix} \end{bmatrix} \end{bmatrix} \end{bmatrix} \end{bmatrix} \end{bmatrix} \end{bmatrix}
\end{bmatrix}
$$

3={weak iff 1≠2, strong otherwise}

Given *das* as the article, the noun SPEC specifies for would be bear a weak DECL value as it is considered to have a full inflectional paradigm (1994:24) and consequently reflects a distinction from its stem, thereby satisfying the condition on the article constraint. Conversely, an indefinite article such as *ein* or the cardinal *zwei* being identical to its stem form would require a strongly declined noun.
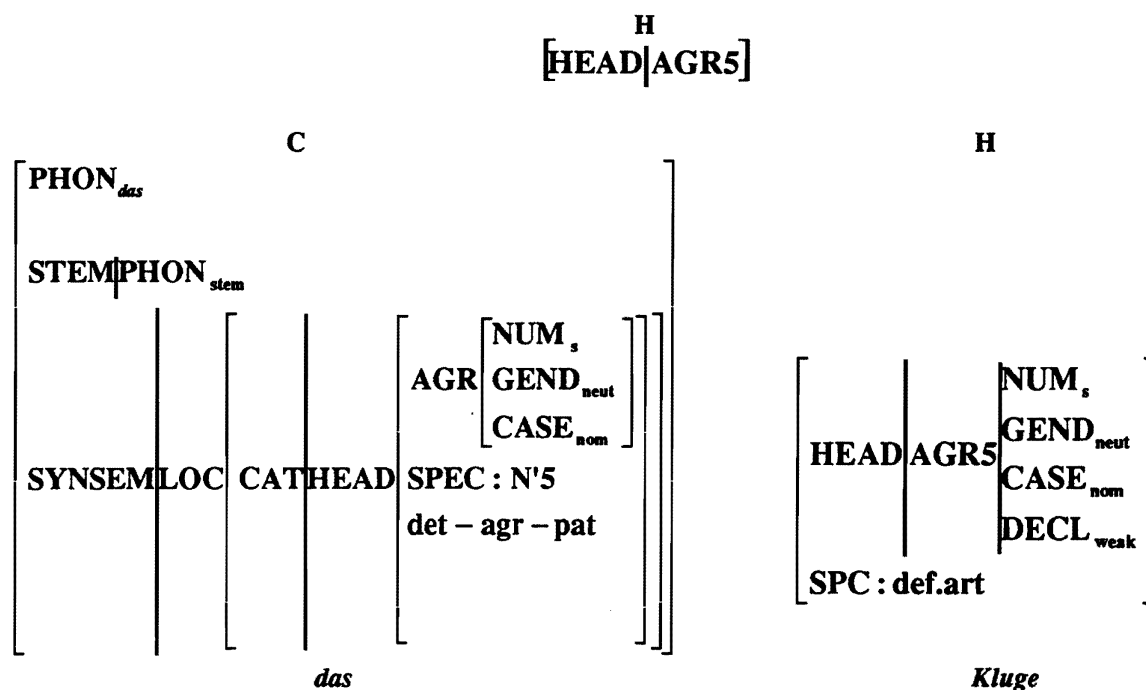
The reciprocal selection between the article and the noun results in the proper government for declension. It is assumed that Pollard and Sag's SPEC Principle ensures agreement between the specified declension value of the article and the noun's declension value while the agreement of case, gender and number do not rely on direct structure sharing and their Semantics Principle. Kathol does not make a distinction between INDEX agreement features, gender and number and the syntactic HEAD feature, case. Case, gender and number are syntactic in that they are all considered values of the HEAD feature AGR like the DECL feature. Agreement of these features is a result of the satisfaction of agreement constraints that are considered head feature values of the article's SPEC N' (or MOD N' in the case of an adjective). For determiner phrases, the constraint would be det-agr-pat as in figure (7) (1994:24).

Figure 7

$$
\begin{bmatrix}
\textbf{det} - \textbf{agr} - \textbf{pat} \\
\textbf{AGR} \begin{bmatrix} \textbf{NUM1} \\ \textbf{GEND2} \\ \textbf{CASE3} \end{bmatrix} \\
\textbf{SPEC} : \textbf{N'} \begin{bmatrix} \textbf{HEAD} \begin{bmatrix} \textbf{AGR} \begin{bmatrix} \textbf{n} - \textbf{agr} \\ \textbf{NUM1} \\ \textbf{GEND2} \\ \textbf{CASE3} \end{bmatrix} \end{bmatrix} \end{bmatrix}
\end{bmatrix}
$$

Agreement of case, gender and number rely on token-identity within this constraint. The agreement values of the determiner must be identical to those of the specified noun and to ensure that the specified agreement values are identical to those of the noun the SPEC Principle would be required. An illustration of Kathol's account of a grammatical determiner phrase showing proper government and agreement is as follows.

Figure 8

$$H$$
$$\left[\text{HEAD}|\text{AGR5}\right]$$

$$
C
\begin{bmatrix}
\text{PHON}_{das} \\
\text{STEM}|\text{PHON}_{stem} \\
\text{SYNSEM}|\text{LOC} \begin{bmatrix} \text{CAT}|\text{HEAD} \begin{bmatrix} \text{AGR} \begin{bmatrix} \text{NUM}_s \\ \text{GEND}_{neut} \\ \text{CASE}_{nom} \end{bmatrix} \\ \text{SPEC} : \text{N'5} \\ \text{det} - \text{agr} - \text{pat} \end{bmatrix} \end{bmatrix}
\end{bmatrix}
$$
das

$$
H
\begin{bmatrix}
\text{HEAD}|\text{AGR5} \begin{bmatrix} \text{NUM}_s \\ \text{GEND}_{neut} \\ \text{CASE}_{nom} \\ \text{DECL}_{weak} \end{bmatrix} \\
\text{SPC} : \text{def.art}
\end{bmatrix}
$$
Kluge

Given the distinction in phonology between the stem and the definite article, the weak declension of the noun satisfies the determiner constraint and the noun specifies for a definite article allowing a weak declension value *viz.* the noun constraint. Both the specified declension value and the noun's actual declension value are identical ensured by the SPEC Principle. Therefore, proper government is achieved and the phrase is licensed by the Valence Principle and the Head Specifier Schema. Agreement of case, gender and number are ensured by means of the det-agr-pat constraint being satisfied and these head features are shared by the phrase and its daughter by means of the Head Feature Principle.

Clearly then, Kathol's approach can account for government and agreement in the determiner phrase given that a caveat be made to allow for disjunctive declension values for undeclined nouns as was the case with Pollard and Sag's account. However, Kathol provides a link between morphology and government through describing the government of the noun in terms of the phonological form of the article, which was not available in the previous account.

3.2 Determiner and the Noun as Head

In the previous analyses, we have seen that the noun governs its determiner. A problem inherent in such an approach is apparent in the necessity of the disjunctive specification of an article by the noun (as undeclined nouns bear dual declension marking). In answer to this, Netter proposes an approach, in which the determiner is responsible for selecting the noun.
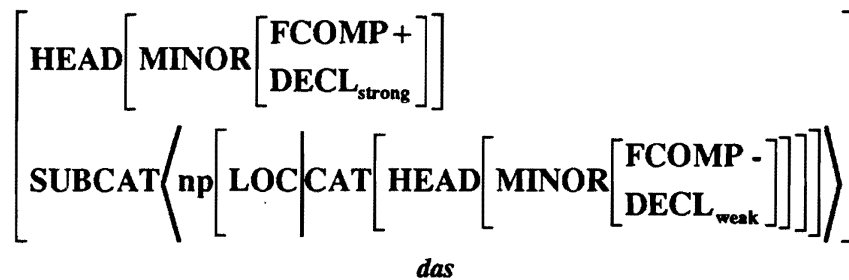
On Netter's account, a simple determiner phrase is comprised of two categories a major being either a noun or an adjective and a minor such as an article which acts as the functional head. This head subcategorises for a major, or substantive, category, however it is optional through an unspecified value for the major category to select a functional head (1994:310). MAJOR and MINOR are the crucial head features of this analysis. A binary MINOR feature, FCOMPL, tags the major category for the requirement of a functional head to create a maximal projection (-), a DP (fully saturated) which is marked as complete (+) given the Functional Completeness Constraint (1994:312). In addition, the functional head carries a (+) value. This ensures that a functional category can only occur once in a phrase and that the major category will not occur on its own.

Unlike in the previous approaches, here Netter assumes that declension is a feature of both nouns and articles. It is considered a MINOR feature (1994:326) which allows determiners and nouns to have differing declension values, as MINOR features are not required to be shared by both the functional heads and the substantive categories.

Declension values distinguish between inflected and uninflected articles (including cardinals). An inflected article specifies for the head of its complement to be weakly declined and an uninflected article is left unmarked for this value and is forced to share what value it might acquire with its complements. In addition, the maximal projection DP is always marked for a strong declension value (1994:326).

In the case of the determiner phrase, *das Kluge* the inflected article bears the MINOR features FCOMP+ and DECL strong. Through subcategorisation, *das* defines its weakly declined complement, *Kluge*, as in the following figure.

Figure 9

$$\begin{bmatrix} \text{HEAD} \begin{bmatrix} \text{MINOR} \begin{bmatrix} \text{FCOMP}+ \\ \text{DECL}_{\text{strong}} \end{bmatrix} \end{bmatrix} \\ \text{SUBCAT} \left\langle \text{np} \begin{bmatrix} \text{LOC} \Big| \text{CAT} \begin{bmatrix} \text{HEAD} \begin{bmatrix} \text{MINOR} \begin{bmatrix} \text{FCOMP} - \\ \text{DECL}_{\text{weak}} \end{bmatrix} \end{bmatrix} \end{bmatrix} \end{bmatrix} \right\rangle \end{bmatrix}$$

das

The selection of the *das'* complement is licensed by a head complement schema, which allows the functional head to select locally a non-head (Pollard and Sag 1994:362). The subcategorisation value of the head is satiated by the CAT|HEAD|MINOR values of *Kluge* resulting in the phrase having a saturated SUBCAT value ensured by the SUBCAT Principle. In addition, there is no violation of the Head Feature Principle in that the head values of the mother agree with those of the functional head, FCOMP+ and DECL strong.

This account of a determiner phrase with a definite article exhibits lateral governance between the head and its complements as did Pollard and Sag's and Kathol's approaches. However, in contrast to these other accounts, there is no reciprocal selection in this approach; the burden of selection is the sole responsibility of the article. Another major difference evident in Netter's account emerges with his account of indefinite or uninflected articles. This account exhibits horizontal governance.
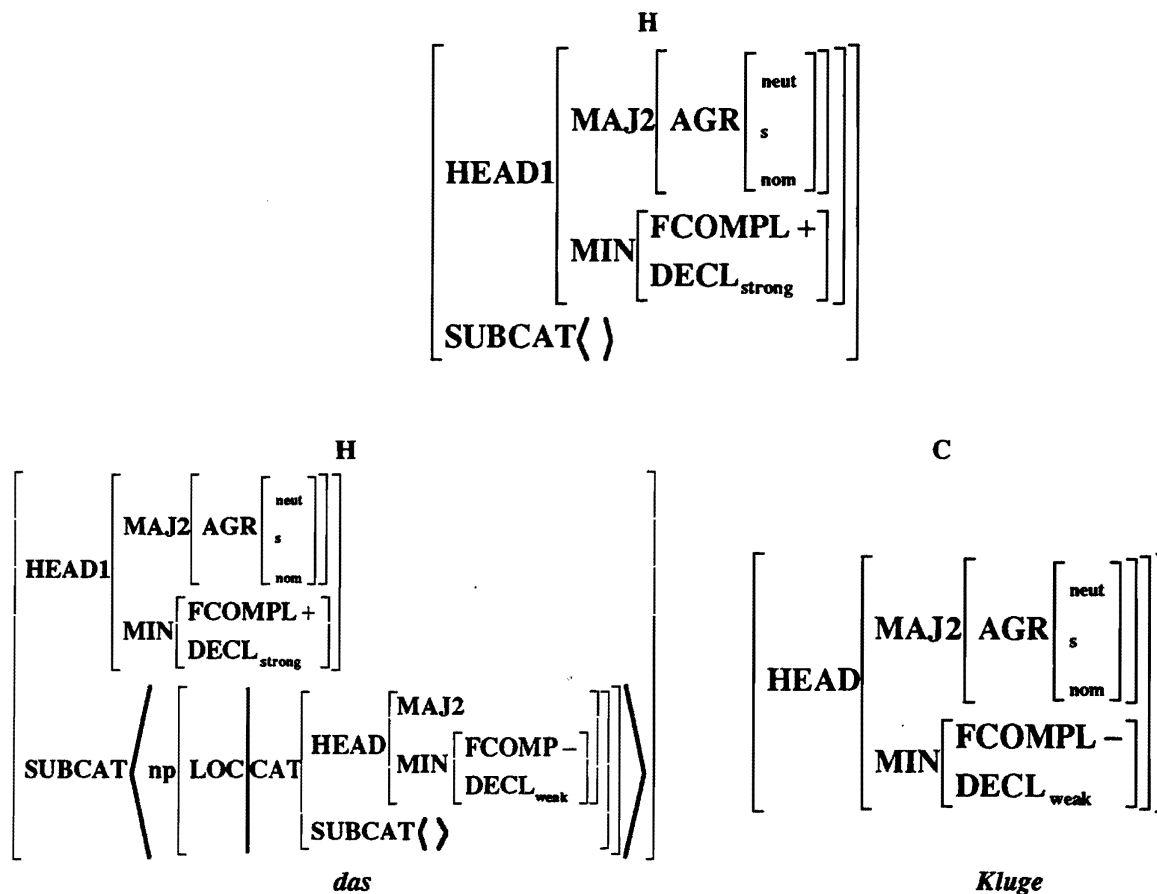
Consider the determiner phrase *ein Kluges*. The article does not have an inflectional ending and is therefore unspecified for a declension value. It is not until the phrase qualifies as a DP that the functional head receives this value. As we have seen DP is restricted to bearing a strong value and this value must agree with that of the head by virtue of the Head Feature Principle. Therefore, *ein* is no longer unspecified for declension and now bears a strong inflection value, which it is required to share with its complement. Consequently, *Kluges* is chosen as the appropriate complement owing to its strong declension value.

However, Netter does not discuss why the strong declension value of uninflected articles is not expressed. In addition, it is not clear, why an inflected determiner such as *das*, which is also strongly declined, governs a weak declension value for its complement. Therefore, there must exist some inherent difference between an uninflected article such as *ein* or *zwei* and the inflected *das* to trigger the government of different declension values. Clearly, this issue warrants further attention.

The issue still remains of how the features case, gender and number agree within the determiner phrase. Following Kathol's treatment of agreement features, these features are considered head features. However, they are not MINOR features as was declension, but are of the MAJOR sort. MAJOR features are required to be shared between the functional head and its complement (1994:310). This is accomplished through structure sharing: the

agreement features of the functional head are shared with those of its subcategorised complement. The SUBCAT Principle guarantees that these values are satiated in the noun before a saturated maximal projection can result. The agreement features are evident in the phrase by means of the Head Feature Principle, which percolates these features up from the functional head. Given that agreement is then accounted for, we have a properly governed determiner phrase, *das Kluge* that exhibits feature agreement, as illustrated in the figure (10).

Figure 10

$$
H
$$

$$
\begin{bmatrix} \text{HEAD1} \begin{bmatrix} \text{MAJ2} \begin{bmatrix} \text{AGR} \begin{bmatrix} neut \\ s \\ nom \end{bmatrix} \end{bmatrix} \\ \text{MIN} \begin{bmatrix} \text{FCOMPL} + \\ \text{DECL}_{strong} \end{bmatrix} \end{bmatrix} \\ \text{SUBCAT} \langle \ \rangle \end{bmatrix}
$$

$$
H
$$

$$
\begin{bmatrix} \text{HEAD1} \begin{bmatrix} \text{MAJ2} \begin{bmatrix} \text{AGR} \begin{bmatrix} neut \\ s \\ nom \end{bmatrix} \end{bmatrix} \\ \text{MIN} \begin{bmatrix} \text{FCOMPL} + \\ \text{DECL}_{strong} \end{bmatrix} \end{bmatrix} \\ \text{SUBCAT} \left\langle \begin{bmatrix} np & \text{LOC} \begin{bmatrix} \text{CAT} \begin{bmatrix} \text{HEAD} \begin{bmatrix} \text{MAJ2} \\ \text{MIN} \begin{bmatrix} \text{FCOMP} - \\ \text{DECL}_{weak} \end{bmatrix} \end{bmatrix} \\ \text{SUBCAT} \langle \ \rangle \end{bmatrix} \end{bmatrix} \end{bmatrix} \right\rangle \end{bmatrix}
$$

das

$$
C
$$

$$
\begin{bmatrix} \text{HEAD} \begin{bmatrix} \text{MAJ2} \begin{bmatrix} \text{AGR} \begin{bmatrix} neut \\ s \\ nom \end{bmatrix} \end{bmatrix} \\ \text{MIN} \begin{bmatrix} \text{FCOMPL} - \\ \text{DECL}_{weak} \end{bmatrix} \end{bmatrix} \end{bmatrix}
$$

Kluge

A determiner phrase on Netter's account can be accounted for by assuming a functional head which selects its complement *viz.* the Head Complement Schema and subcategorises for it according to the criteria set out by its inflectional type. The Subcat Principle ensures saturation of these requirements and also those of the agreement features shared with the head. The Head Feature Principle then maintains that the agreement features are evident at the phrase level, which is specified as a functionally complete category requiring no further specification. However, as with the other approaches this one still must assume that the uninflected nouns have disjunctive declension values to enable the article to govern for the required values. In addition, while this approach can in fact account for determiner phrases comprised of uninflected articles, the assumption that these and the inflected variety have the same declension value while exhibiting different government patterns is somewhat problematic.

As we have seen, all three approaches can account for determiner phrases in German. Each relies on some form of structure sharing to ensure that all the phrase's constituents agree in case, gender and number. Regardless of a noun-head or an article-head approach, proper government of the declension value can be attained; Kathol offers the additional advantage of linking this government to the morphology of the article. However, the declension value for all three approaches must be disjunctively specified in uninflected nouns to ensure correct specification and

government. In addition, the applicable cardinals that are acting as an article can be accounted for on all three accounts if they are assumed as either a weak or an uninflected determiner.

4. Conclusion

In conclusion, the approaches of Pollard and Sag, Kathol, and Netter are able to provide a basic account of agreement in the German noun phrase provided some additional proposals are assumed. However, each approach carries with it inherent difficulties.

In order to account for all noun phrases, an assumption must be made by all four authors that being that substantive adjectives are a subclass of nouns. In addition, this subclass and the uninflected variety must be disjunctively specified for by the article to make them available for selection. Although the definitions of agreement features differ between approaches, agreement within the noun phrase is guaranteed by all through principles that maintain identity of case, gender, number and declension between constituents, such as the SPEC principle, Schema 5 or specific constraints.

Although the government of declension within the noun phrase differs in terms of origination, i.e. noun or determiner, the results are much the same for these accounts. Either by lateral government in reciprocal selection on Pollard and Sag and Kathol's accounts or by lateral government where the article subcategorises for appropriate values or horizontal where they are percolated down from the phrase, a weakly inflected article selects a strongly declined N' and a strongly inflected one chooses a N' that has weak declension. However, an additional benefit emerges from Kathol's approach that links government with the morphology of the language.

With or without an article, a modifier selects its noun. The phrase is licensed by Schema 5 on all three accounts. However, Netter offers the most promising approach by preventing the occurrence of a weakly declined N' and the modification of a determiner phrase given that the SPEC feature is extended to the noun class.

However, while Netter offers definite benefits in this regard, his approach has drawbacks when considering the case of cardinals in German. The other authors can easily account for the determiner-like and adjectival roles these forms play if a dual lexical entry for them is assumed. However, on Netter's account these forms are considered functional heads regardless of their varying roles. In the instance of a cardinal as an adjective, an applicable form as a functional head prohibits further specification by virtue of its positive value for functional completeness. In addition, his assumption that cardinals and all other uninflected forms bear a strong value is problematic considering that this removes an apparent distinction that seems linked to the government of declension.

In sum, while the approaches posited to account for German internal noun phrase agreement could, for the most part, account for these issues, a little fine-tuning is still in order. In addition, many other issues have not been addressed that require attention. The issue of post-positioned adjectives which fail to exhibit any form of inflection, such as in *das Kluge, letzt* and that of possessive pronouns that follow a demonstrative article in a noun phrase, such as *dieses unseres Landes/dieses unseren Landes*, which bear dual declension values are just a few examples which require further research.

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Appendix A

German Determiners

The determiners of German decline according to grammatical gender, number and case. The following paradigms represent their declension:

Definite

	SING			PLUR		
	Masc	Fem	Neut	Masc	Fem	Neut
NOM	der	die	das	die	die	die
ACC	den	die	das	die	die	die
GEN	des	der	des	der	der	der
DAT	dem	der	dem	den	den	den

Indefinite

Singular only	Masc	Fem	Neut
NOM	ein	eine	ein
ACC	einen	eine	ein
GEN	eines	einer	eines
DAT	einem	einer	einem

Appendix B

Standard Nouns

German nouns have inherent gender and inflect for number and case. The inflection paradigm follows for the noun *Buch* 'book (neuter gender)':

Buch

	SING	PLUR
nom	Buch	Bücher
acc	Buch	Bücher
gen	Buches	Bücher
dat	Buch(e)	Büchern

Appendix C

Substantival Adjectives

All attributive adjectives can be used as nouns. Their status as a noun is indicated by the capitalization of the initial letter in most instances. While standard nouns inflect for plurality and the genitive case, attributive adjectives differ in that they exhibit declension features. These declension features are distributed as follows:

Weak Forms of Klein +

	SING			PLUR		
	MASC	NEUT	FEM	MASC	NEUT	FEM
NOM	-e	-e	-e	-en	-en	-en
GEN	-en	-en	-en	-en	-en	-en
DAT	-en	-en	-en	-en	-en	-en
ACC	-en	-e	-e	-en	-en	-en

Strong Forms of Klein +

	SING			PLUR		
	MASC	NEUT	FEM	MASC	NEUT	FEM
NOM	-er	-es	-e	-e	-e	-e
GEN	-en/NA	-en/NA	-er	-er	-er	-er
DAT	-em/-en	-em/-en	-er	-en	-en	-en
ACC	-en	-es	-e	-e	-e	-e

Mixed Forms of Klein +

	SING			PLUR		
	MASC	NEUT	FEM	MASC	NEUT	FEM
NOM	-er	-es/-e	-e	-en	-en	-en
GEN	-en	-en	-er	-en	-en	-en
DAT	-en	-en	-en	-en	-en	-en
ACC	-en	-es/-e	-e	-en	-en	-en