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Anaphora and Exemptness
A comparative treatment of anaphoric binding in German and English

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0.   **Introduction**

HPSG's binding theory, as proposed for English in Pollard/Sag (1992, 1994), assumes a distinction between exempt and non-exempt anaphora. Exempt anaphora do not obey the regime of Principle A of Binding Theory because they are not locally o-commanded. Non-exempt anaphora, being locally o-commanded, have to be bound in a local domain, as illustrated in (1).

(1)   a. $John_i$ likes $himself_{i/*j}$.
      b. *$John_i$ knows $Bill_j$ likes $himself_i$.

Since exempt anaphors are exempt from Principle A of Binding Theory, they do not have to be bound syntactically. Instead, their behavior with respect to possible coindexations is determined by pragmatic and discourse factors, such as logophoricity. The behavior of exempt anaphors in the grammar of English can be illustrated by the last two lines of Queen and Bowie's 1982 song *Under Pressure:*

(2)   This is our_i last dance. This is $ourselves_i$ under pressure.

The coindexation in (2) is not due to locality constraints on anaphoric binding, as stressed by the fact that the antecedent of the reflexive in the second sentence is contained in an NP in the first sentence. Obviously, the observed coindexation is determined by discourse-factors such as point of view, salience, or logophoricity.[1] Since point of view plays a role in determining the antecedent of the anaphor in (2), anaphors of this type have occasionally been called *logophoric anaphors.*
Exemptness considerations apply not only to the coindexings in (2), but also to the cases of picture NP anaphora. Pollard/Sag (1992,1994) employ this notion to explain the puzzling behavior of simple *picture NP reflexives* and *reciprocals,* like the ones in (3).[2]

(3)   a. $John_i$ found [a picture of $himself_i$].
      b.   The $women_i$ selected [pictures of each $other_i$].

Principle A of Pollard/Sag's Binding Theory requires that *locally o-commanded* anaphors must be *locally o-bound* (4). Picture NP reflexives and reciprocals are not locally o-commanded, since they usually occur as sole elements of the SUBCAT (or ARG-ST) list of their heads.

(4)   Principle A (English, Pollard/Sag 1994):
      A locally o-commanded anaphor must be locally o-bound.

Being not locally o-commanded the reflexives and reciprocals in (3) are exempt from Binding Theory. The actual coindexation of picture NP reflexives and reciprocals is due to the viewpoint taken.
Pollard and Sag's analysis rests on two assumptions which seem to hold in English, but do not apply to German: First, the analysis is based on the undisputed existence of logophoric reflexives in Eng-

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[1]   The relevance of logophoricity for anaphoric relationships is discussed in Sells (1987), Zribi-Hertz (1989), Pollard/Sag (1992, 1994), and Reinhart/Reuland (1993).
[2]   A similar treatment of picture NP reflexives is proposed in Reinhart/Reuland (1993) and in Hornstein (2000).

lish.[3] Second, Pollard/Sag (1992, 1994) observe that the binding patterns in (3) are not as strict as would have been expected if the anaphors were constrained by Principle A. The following examples from Pollard and Sag's work show that picture NP reflexives can be bound across intervening definite, quantificational, and expletive subjects, provided that they are not locally o-commanded:[4]

(6) a. Bill$_i$ remembered that *the Times* had printed a picture of himself$_i$.
     b. Bill$_i$ thought that *nothing* could make a picture of himself$_i$ in the Times acceptable to Sandy.
     c. They$_i$ made sure that it was clear to themselves$_i$, that this needed to be done.

The possibility of an anaphoric binding across an expletive subject, as in (6c), is sanctioned by the very definition of o-command as given in Pollard/Sag (1994:253): since expletives do not bear a referential index, they do not belong to the set of potential o-commanders. Thus they cannot become potential binders, and anaphors which would otherwise be o-commanded by them turn out to be exempt from Principle A, as in (6c).

German resembles English with respect to picture NP reflexives: like their counterparts in English, picture NP reflexives may occur in a domain in which also pronouns are allowed. Therefore, in German, as well as in English, the putative complementary distribution between anaphors and pronouns breaks down in picture NP contexts. The breakdown in English is accounted for by assuming that picture NP reflexives (and reciprocals) are actually exempt from binding theory, and hence free. It is thus not surprising that they may occur in contexts in which pronouns are accepted. German, however, lacks any evidence for a logophoric use of reflexive or reciprocal pronouns. Since German reflexives cannot be logophoric, one wonders in which way picture NP reflexives can be acounted for. The solution presented here assumes that picture NP reflexives in German are never logophoric, because the German version of Principle A does not allow reflexives and reciprocals to become exempt.

The aim of the present paper is to present a comparative treatment of reflexives in German and English. To achieve this goal, we set up a theoretical framework which allows us to derive the Principles A for German and English from a universal, general formulation of a Proto-Principle A, by determining parameter settings from a small parameter space.

So, instead of proposing a completely unrelated Principle A for German which covers the German facts but does not connect them to their English cousins, we will offer a parametric approach. The parameter space can be approached by considering the following four problems of a definition of Principle A:

First, do only locally o-commanded anaphors have to obey Principle A? Assuming that this is the case for English, but not for German, we arrive at two parameters: Whereas in English only a subclass of o-commanded anaphers has to obey Principle A, it has to be obeyed by every anaphor in German.

Second, we have to ask which elements actually count as potential binders: In English, only local o-commanders count as binders, but we present evidence that this does not hold for German, where a *minimal* characterization of binding distance seems appropriate.

Third, the prominent role of subjects as binders has to be investigated. In German, e.g., a minimal binder (as opposed to a local one) has to be a subject.

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[3] Interestingly, Pollard/Sag (1992, 1994), as well as Zribi-Hertz (1989), are able to present a whole set of data showing the independent existence of logophoric reflexives, but do not present examples of logophoric reciprocals. Their analysis is thus only partially based on independent data.

[4] This observation has already been presented in Kuno (1987).

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Finally, we consider the question whether only referential elements may become potential binders. With respect to German, the answer seems to be negative.

The parameter space sketched above opens a finite space of possibilities for formulations of Principle A. While the relevant parameters are set in one direction in English, their opposite seems to hold for German, thus explaining the differences in anaphoric binding between these two languages. The present proposal also accounts for the similarities: despite the individual differences, English and German share the property that anaphoric elements behave like pronouns in picture NP contexts. Logophoricity seems to be an appropriate explanation for picture NP reflexives in English, but such a correlation cannot be maintained universally.

As for German, the difference between local and minimal binding offers the explanation for the breakdown of a complementary distribution between pronouns and anaphors.

The paper is structured as follows:

Section 2 presents some basic facts about anaphoric binding in German and compares the German data and findings to the ones given for English in Pollard/Sag (1992, 1994). Three sets of problematic data are identified: Ordinary picture NP reflexives, reflexives contained in adjuncts, and dislocated picture NP reflexives. Based on the data presented in section 2, section 3 is concerned with a formulation of Principle A in German. Building on insights from Frey (1993), Principle A for German makes use of subject-orientedness in the notion of *minimal binding*. Section 4 presents the implications of the analysis for a general theory of anaphoric binding. The parameter space is introduced and certain predictions concerning anaphoric bindings in the languages of the world are made. In addition, we discuss the impact of so-called *long-distance anaphora,* which do not obey local binding constraints but still cannot be analyzed as being logophoric. Finally, cases of binding into an AcI-complement clause will be discussed as well.

2. Some properties of picture noun phrase reflexives in German

German resembles English (and many other languages) in that a complementary distribution between pronouns and anaphors breaks down in picture noun phrase contexts. This is illustrated in (7), where the anaphor *sich* and the pronoun *ihn* can both be bound by the subject *Ulrich*.[5]

(7) a. Ulrich$_i$ las ein Buch über sich$_i$.
     Ulrich read a book about self
   b. Ulrich$_i$ las ein Buch über ihn$_i$.
     Ulrich read a book about him

However, as has been observed in Frey (1993), the similarity between German and English requires certain qualifications. For instance, German reflexives contained in picture noun phrases can only be bound by syntactic subjects, as is illustrated in (8a, b). The ungrammatical German example (8a)

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[5] It has sometimes been suggested that a comparison between German and English anaphors should not use the simple reflexive *sich* but the complex form *sich selbst*. A discussion between simple and complex reflexives can be found in Reinhart/Reuland (1993) among others. It is our opinion that German *selbst* should not be equated with English *self* as a reflexive marker, but instead as an emphatic intensifier. In any case, none of the examples presented below improves after *sich* has been replaced by *sich selbst*. In the English glosses, German reflexive *sich* will be represented as self.

contrasts with the grammatical English example (8c). In German, a pronoun is obligatory if the object should bind the pronominal in the picture NP. This is shown in (8b).[6]

(8) a. *Ich überreichte dem Ulrich$_i$ ein Buch über sich$_i$.
       I   gave   the Ulrich a   book about self
    b. Ich überreichte dem Ulrich$_i$ ein Buch über ihn$_i$.
       I   gave   the Ulrich a   book about him
    c. I gave John$_i$ [a book about himself$_i$].

As has also been discussed by Frey (1993), the pattern observed with picture NP reflexives in (8) carries over to adverbial PPs: similar to the former case, a reflexive contained in an adverbial PP is not in complementary distribution to a pronoun (9a, b), and in addition, has to be bound by a subject, while a binding through an object is illicit (9c).[7]

(9) a. Ulrich$_i$ hat Annette bei sich$_i$ bewirtet.
       Ulrich has Annette at self fed
    b. Ulrich$_i$ hat Annette bei ihm$_i$ bewirtet.
       Ulrich has Annette at him fed
    c. *Ulrich hat Annette$_i$ bei sich$_i$ bewirtet.
        Ulrich has Annette at self fed

None of the illicit bindings in (8) or (9) improves under point-of-view inducing constructions, as is illustrated in (10a) for the adverbial case and in (10b) for the picture NP case.

(10) a. Maria$_j$ fürchtete, daß Ulrich$_i$ die Kinder$_j$ bei sich$_{i/*j}$
        Maria feared   that Ulrich the children at self
        bewirtet hatte.
        fed   had
     b. Gernot$_i$ fürchtete , daß Ulrich$_j$ ein Buch über sich$_{*i/j}$
        Gernot feared   that Ulrich a   book about self
        geschrieben hatte.
        written   had

Moreover, German differs from English in that a binding of an anaphor across a definite, quantificational, or expletive subject is impossible. The ungrammatical examples in (11) contrast with the grammatical examples from English given in (6).

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[6] That certain cases of non-local – not to be confused with long distance – reflexives have to be bound by subjects is discussed in Chomsky (1986) and Dalrymple (1993). Cf. also the discussion in Pollard/Sag (1994:272ff.).

[7] Neither Pollard/Sag (1994) nor Reinhart/Reuland (1993) discuss adverbial adjuncts in English. The implicit prediction made, however, is that adjunct reflexives should behave like picture NP reflexives. They are thus considered to be exempt from Principle A just like picture NP reflexives. This assumption is actually borne out by the facts, as can be witnessed by (i), taken from Foster, D.: *Author Unknown. On the trail of the anonymous.* New York, 2000, p. 110.
(i) [T]he Unabomber$_i$ fancied that a coolheaded logician like himself$_i$ would never be apprehended.
The assumption that *like*-phrases are actually adjuncts is supported by the following observations (Bob Levine, Tom Hukari, p.c.):
a. they are subject to *one*-replacement (cf. Jackendoff 1977),
b. R-expressions contained like-phrases do not induce reconstruction and Principle C violations (ii).
(ii) Which author (just) like your brother$_i$ do you think that he$_i$ attacked in his latest book?

(11) a. *Gernot$_i$ erinnerte sich daran, daß die ZEIT ein Bild
         Gernot remembered self expl. that the ZEIT a   picture
      von sich$_i$ veröffentlicht hatte.
      of self published   had
   b. *Gernot$_i$ dachte, daß niemand ein Bild   von sich$_i$
        Gernot thought that nobody a   picture of self
      veröffentlichen wollte.
      published   wanted
   c. *Sie$_i$ kamen überein, daß es   sich$_i$ klar   war, daß der Krieg
      They established   that expl self obvious was that the war
      beendet werden mußte.
      ended   PASS   had-to

The data presented so far strongly suggests that a distinction between exempt and non-exempt anaphora does not seem to exist in German. This conclusion is further substantiated by dislocated picture NP anaphors, as illustrated in (12b).

(12) a. Gernot$_i$ glaubt, daß der Ulrich$_j$ das Buch über sich$_{*i/j}$ mag.
        Gernot believes that the Ulrich the book about self   likes
   b. Das Buch über sich$_{*i/j}$ glaubt der Gernot$_i$ mag der Ulrich$_j$.
      the book about self   believes the Gernot likes the Ulrich

The ungrammaticality of the coindexing of *sich* with *Gernot* in (12b) should be compared with an example given in Pollard/Sag (1994:265), where a dislocated reflexive may bear both indices.[8, 9]

(13) Which picture of himself$_{i/j}$ did John$_i$ think Fred$_j$ likes.

As for (13), Pollard/Sag (1994:263f.) point out that "there is no sense in which the anaphor *himself* is contained within the trace position … even if it were, our Principle A would not apply to it." It seems then that Principle A should be recast to apply to anaphors in German.

The data in (10) – (12) corroborate the conclusion that exempt anaphora do not exist in German. The binding patterns observed for picture noun phrase reflexives are indeed obligatory. Moreover, independent evidence for logophoric anaphora could not be presented. Hence, one cannot universally reduce the behavior of picture NP reflexives to the property of being an exempt anaphor.
Given that a distinction between exempt and non-exempt anaphora breaks down for German, the following desiderata emerge: First, the Principle A for German has to be defined in such a way as to cover the cases given above. Secondly, Principle A must be formulated in a manner that captures the obligatory binding patterns of picture NP reflexives as well. Finally, Principle A for German has to be related to Principle A for English in a sense that identifies the differences and correspondences between the two languages with respect to anaphoric binding. One commonality is that picture NPs offer a local domain in which a complementary distribution between anaphors and pronouns cannot be maintained.

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[8] Cf. also Williams (1986).
[9] The following contrast reported in Reinhart (1983:131) is presumably due to the different viewpoints taken in (i) and (ii). It is highly unlikely that it is *Felix's* viewpoint which is taken in (ii). Therefore, a logophoric interpretation of the anaphor resulting in a coindexation with *Felix* is ruled out.
     (i) Which fancy story about *himself* did *Felix* tell you this time?
     (ii) *Which fancy story about *himself* did you tell *Felix* this time?

In the following, we will first present a version of Principle A for German which does not make use of exemptness to cope with picture NP and adverbial reflexives. It should be kept in mind that this is just an intermediate step. The ultimate goal is to define a universal Principle A which allows us to explain the exemptness of picture NP reflexives in English as well as to determine their behavior in German.

3. **Minimal binding and Principle A for German**

We have observed that reflexives contained in picture NPs and adjunct phrases have to be bound obligatorily by the next available subject, if the reflexive is the least oblique element on the ARG-ST of the head which is subcategorized for the reflexive. If a picture NP contains a specifier, as in (14a) or an adjunct phrase modifies an NP which becomes the 'external argument' of the adjunct (14b, c), a local binding is required.[10]

(14) a. Ulrich$_i$ zeigte [Marias$_j$ Bild   von sich$_{*i/j}$].
         Ulrich showed Marias picture of self
     b. *Ulrich$_i$ hat [die Frau neben   sich$_i$] angegriffen.
          Ulrich hat the woman next-to self attacked
     c. *Ich stellte   Maria$_i$ [den Jungen   neben   sich$_i$] vor.
          I   introduced Maria   the boy   next-to self   PREF

Taken together with the standard cases of reflexive binding in (15), the data in (14) suggests that binding in German is constrained by a minimality condition: Local binding is required if a local binder is present.[11] If a local binder is not present, the next subject has to bind the reflexive. This kind of minimality requirement is cast in the version of Principle A given in (15).

(15) Principle A (German):
     An anaphor must be minimally o-bound.

This version of Principle A bears strong resemblance to a definition of Principle A given in Frey (1993). The major difference between Principle A as proposed here and Frey's definition pertains to the structural conditions involved. In Frey's work, both configurational and thematic conditions are used to determine the relevant local domain in which an anaphor has to be bound. The present analysis rests solely on the concepts of o-binding and o-command, i.e. not on configurational but only on relational properties.

Minimal o-binding in turn is defined as in (16). Most of the work is done here by (16b). This condition requires that an anaphor which is not locally o-commanded has to be bound by (i.e. o-commanded and coindexed with) the next available subject.

(16) *Minimal o-binding:*
     Let X and Y bear the same index, then
     a.   X minimally o-binds Y if X and Y appear on the same ARG-ST and X is less oblique than
          Y (= X locally o-commands Y), or

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[10] In (14c), I use PREF to indicate the separable verb prefix *vor,* which combined with the fronted *stellte* forms the preterite of the verb *vorstellen (introduce).* It should be noted that (14b) is grammatical but semantically awkward if the reflexive is coindexed with *die Frau.* The same holds for a coindexation of the reflexive with *den Jungen* in (14c).

[11] Given the examples in (14b) and (14c), we take *presence* to be presence of an argument on ARG-ST, independent of the question whether the argument has been realized syntactically.

b. X minimally o-binds Y if X is the most local subject o-commanding Y, and Y is the least oblique element on its ARG-ST.

The notion of o-command used here takes as its basis the revised version of o-command presented in chapter 6.8.3 of Pollard/Sag (1994:279).

(17) *O-Command* (without adjuncts):
Let Y and Z be synsem objects with distinct LOCAL values. Then Y o-commands Z iff either:
a. Y is less oblique than Z, or
b. Y o-commands some X that subcategorizes for Z, or
c. Y o-commands some X that is a projection of Z (the HEAD values of X and Z are identical), or
d. if Y is on the ARG-ST of some X and Z's MOD value is X, or
e if Y is less oblique than X and Z's MOD value is X.

This definition of o-command differs from Pollard and Sag's definition in two respects: First, we do not require an o-commander to be referential, and second, adjuncts are covered as well by (17d, e).

We will discuss the notions defined above by presenting analyses of the problematic cases given in section 2., beginning with a case of reconstruction.

(17) Das Buch über sich$_{*i/j}$ glaubt der Ulrich mag der Gernot$_j$.
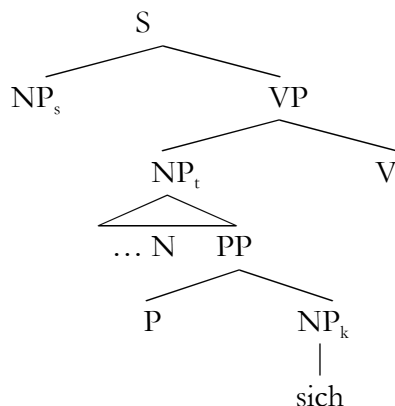
Consider the schematic analysis presented in (17), where the topicalization of the picture NP *das Buch über sich* has been undone. The anaphor contained in the topicalized (and now reconstructed) NP is the least oblique element on the ARG-ST of *Buch*. Hence, the second o-binding condition applies, requiring the anaphor to be bound by the most local o-commanding subject, which is *der Gernot*. It must be the lower subject and not the higher one since the lower subject is the most local o-commanding subject, as can be witnessed by the chain of o-command relationships presented in (18):

(18) NP$_s$ o-commands NP$_t$, since NP$_s$ is less oblique than NP$_t$.
NP$_s$ o-commands N, since NP$_t$ is a projection of N.
NP$_s$ o-commands PP, since N subcategorizes for PP.
NP$_s$ o-commands P, since PP is a projection of P.
NP$_s$ o-commands NP$_k$, since P subcategorizes for NP$_k$.

The established o-command chain is independent of the question whether NP$_t$ is a full NP or a trace, since we accept as being true that obliqueness is defined on ARG-ST. The topicalized phrase

occupies a position which is more oblique than the position of the subject on ARG-ST. We can therefore conclude that the subject o-commands the topicalized phrase.

Next consider the application of condition (16d) to cover cases of reflexives contained in adverbial adjuncts, as in (19).

(19) Ulrich$_i$ hat Annette bei sich$_i$ bewirtet.
      Ulrich has Annette at self fed

The modified definition of o-command includes adjuncts as well. According to condition (16d), an adjunct is o-commanded by each argument of the head which is modified by the adjunct. Again, on the ARG-ST of *bei*, the reflexive is locally free. Hence, the anaphor may only be bound by the subject.

(20) *Sie$_i$ kamen überein, daß es   sich$_i$ klar   war, daß der Krieg
      They established   that expl self obvious was that the war
      beendet werden mußte.
      ended   PASS   had-to

Since we have dropped the requirement that an o-commander has to be referential, the expletive subject in the complement clause in (20) counts as a potential binder. According to Principle A, the anaphor would have to be bound by the expletive, which is impossible. The expletive bears an index of a non-referential type which cannot be identical to a referential index. The matrix subject may not bind the anaphor because the anaphor is locally o-commanded by the expletive complement subject. In this case, minimal o-binding thus implies local o-binding, and a binding through the matrix subject is excluded as well. Consequently, (20) is analyzed as ungrammatical.

4. Towards a universal formulation of Principle A

In the present setting, it seems as if Principle A for German and Principle A for English look totally different. This difference is supported in part by the observation that certain options for English, such as exemptness and anaphoric binding across intervening subjects, are not viable in German. Still, English and German share certain properties which have to be addressed, and, moreover, we are interested in a comparative analysis of German and English, and thus are forced to determine the relationship between these languages theoretically, at least with respect to anaphoric binding. Let us turn to the commonalities first, and then discuss later on how the principles given here can be unified.

4.1 The complementary distribution between anaphors and pronominals

As has been pointed to, an important commonality between German and English anaphoric binding pertains to the breakdown of a complementary distribution between anaphors (reflexives, reciprocals) and pronouns. That this breakdown holds for both languages has been illustrated in (3) and (7). Following Frey (1993), we have also pointed out that picture NP reflexives and adjunct reflexives have to be bound by subjects in German, whereas picture NP reflexives may be bound by both subjects and objects in German, yet, in the long term, we will abstract away from this difference (cf. section 4.4). Pollard/Sag (1994) assume that the breakdown is due to the existence of exempt anaphors in English. An anaphor may occur in a position where a pronoun is grammatical, provided that the anaphor is not locally o-commanded. Not being locally o-commanded, the anaphor is liter-

ally in the same sense exempt from Principle A as an ordinary pronoun. Hence, it does not come as a surprise that they may be found in the same contexts.

A natural generalization of Pollard and Sag's explanation for the breakdown in English suggests itself: an anaphor may appear in a position which is normally occupied by a free pronoun, if the anaphor is exempt from Principle A. Although this argument holds for English, it cannot be maintained universally since it predicts a correlation between exempt or logophoric anaphors and picture NP reflexives in the languages of the world. We have shown, however, that this correlation does not exist. In the present framework, we assume that the breakdown of a complementary distribution of anaphors and pronominals in German is due to the different formulations of Principles A and B with respect to the locality conditions imposed. While Principle A requires a minimal binding for an anaphor, Principle B demands a local freedom of the pronoun (cf. Pollard/Sag 1994:254).

(21) Principle B:
    A personal pronoun must be locally o-free.

In a typical picture NP reflexive construction, the pronoun is locally free, and so is the anaphor in the same position. Since not local but minimal binding is required for anaphors, the breakdown is predicted, but for reasons which are different from the ones given for English.[12]

4.2 Exemptness and binding: which anaphors have to be bound

Although Principle A as given in (15) for German is descriptively adequate in covering the problematic cases in (10) – (12) as well as in offering an explanation of the breakdown of a complementary distribution between anaphors and pronouns, the whole idea of developing independent *Principles A* for individual languages is obviously flawed. We have seen in the preceding sections that Principle A for English offers a space for exempt anaphors while Principle A for German does not allow exemptness. Moreover, Principle A for English makes certain restrictive predictions about the nature of the potential binders, as well as predictions concerning their relationship to the anaphors. In English, potential binders have to be referential, and they have to locally o-command the anaphor. These conditions have been given a completely different rendering in the formulation of Principle A for German: every element which is more prominent on ARG-ST may count as a potential binder (including non-referential elements), and binding is required to apply minimally, yet locally.

I think that by identifying the differences between the formulations of Principle A in German and English, we may provide a uniform formulation of a universal Principle A, from which the individual language-specific principles can be derived.

The first difference concerns the very nature of exemptness: if only locally o-commanded anaphors are constrained by Principle A of binding theory, we predict that anaphors which are not locally o-commanded are not covered by Principle A. But exemptness should not be interpreted as a universal option. In contrast, we may conceive formulations of Principle A which tighten the constraint by including more and more anaphors under its regime, but crucially by just employing the notion *obliqueness,* and its derivative *o-command.* The different options are determined by establishing the domain in which Principle A is applied. Three options are available: first, Principle A applies to locally o-commanded anaphors only. Second, Principle A applies to o-commanded anaphors only, where

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[12] It should be noted here that Pollard and Sag's treatment picture NP reflexives as logophors has been recently disputed by Golde (2000).

locally o-commanded anaphors are properly included in the set of o-commanded anaphors. Finally, every anaphor – be it o-commanded or not – is subjected to the regime of Principle A. This latter option is applied to German since simply no exempt anaphors exist in this language. To see this, consider the examples in (22).

(22) a. *Himself sleeps.
    b. Ihn   friert.
        him$_{acc}$ is-cold
    c. *Sich   friert.
        himself is-cold.
    d. Mir graut vor dir.
        Me$_{dat}$ fears of you.
    e. *Sich   graut vor dir.
        himself fears of you.

Pollard/Sag (1994:262f.) explain the ungrammaticality of (22a) by taking recourse to a case mismatch between the subcategorization requirements of the finite verb and the case specification of the reflexive. Such an explanation would not work for German, where impersonal constructions appear with the ARG-ST specifications given in (23). Hence the ungrammaticality of (22c) and (22e) cannot be derived from case-theoretic reasons, as has been pointed out by Müller (1999). The reflexive *sich* can bear dative and accusative case, and thus matches the requirements imposed in (23).

(23) a. *frieren:* ARG-ST <NP[acc]$_{[x]}$>
    b. *grauen:* ARG-ST <NP[dat]$_{[x]}$, PP[vor]$_{[y]}$>

In the present analysis, the ungrammaticality of (22c) and (22e) follows from the assumption that each anaphor has to be bound. Between English and German, we expect the existence of languages which require that o-commanded anaphors have to be bound. In such a language, certain anaphors may still be logophoric, particularly subjects of matrix clauses (which are never o-commanded), as well as anaphors contained in the subject of a matrix clause if the head of the subject NP is an intransitive predicate.

Therefore we may identify the set anaphors to which Principle A is applied as a *first parameter*. Depending on its setting, the set of pertinent anaphors may contain every anaphor, or only o-commanded anaphors or even just locally o-commanded anaphors.

4.3 Potential o-commanders and binding distance

Both the *second* and the *third parameter* concern the set of potential binders. While the second parameter has a structural effect in determining whether a binder has to be locally related to the anaphor or just minimally related, the third parameter determines the semantic type of potential binders. Recall that we have presumed for German that every element occuring on ARG-ST counts as a potential binder. For English, Pollard/Sag (1994) accept as being true that only referential elements count as potential binders, thus excluding expletives and other non-referential elements from becoming binders.
The third parameter does not directly enter into the definition of Principle A, but indirectly addresses it through the definition of o-command: if o-command is restricted to referential elements, expletives do not count as binders in the sense of Principle A.

We predict a subtle interaction between the first and the third parameter. Let us assume a language where every o-commanded anaphor has to be bound. If this language also shows expletive pronouns, an object anaphor may become exempt from Principle A if the third parameter constrains the set of potential binders to the referential ones.

The second parameter concerns the relationship between the binder and the anaphor in terms of proximity: according to the present picture, anaphors may either be bound by a local o-commander, or by a minimal o-commander. It should already be noted that this characterization excludes anaphors which are neither locally nor minimally o-bound. This issue will be addressed shortly.

I will call the three parameters *exemptness, proximity,* and *referentiality.* Given these parameters, we have opened a parameter space for possible formulations of Principle A. Individual, language-specific versions of Principle A result from determining the parameters, i.e. by answering the following questions affirmatively or negatively.

(24) a. [Exemptness] Do only anaphors which are (locally) o-commanded require syntactic binding?
b. [Referentiality] Are potential binders restricted to referential elements or not?
c. [Proximity] Do only local o-commanders count as binders?

Principle A in German, e.g. comes about by assuming that there is no exemptness, that proximity is loosened, and referentiality is not required. Principle A in English is determined by assuming that there is maximal exemptness, strict proximity, and a restriction on referentiality. Each of the parameters is orthogonal to the other ones. Concentrating on the first and the third parameter, the following picture emerges for German and English:

(25)

		E	G
Exemptness	local o-command	+	-
	o-command	+	-
Proximity		+	-
Referentiality		+	-

It should be noted that the exemptness parameter requires the determination of two values, viz. whether local o-command or just o-command is required. If local o-command is required, the value for o-command is also determined by affirmation. In English, local o-command is assumed, while in German, every anaphor has to be bound and hence, both local o-command and o-command are determined by fixing a negative value. German and English also differ in the other values, for proximity and referentiality.

As I said above, I assume that every anaphor which falls under Principle A of binding theory has to be bound either locally or minimally. In (25), this is implemented by assuming that *proximity* differs from *exemptness* in that it cannot be split up into further subconditions. Such subconditions would e.g. look like the table given in (26), where Proximity is subdivided into *local* and *minimal.*

(26)

		A	B	C	D
Proximity	local	+	-	-	+
	minimal	+	+	-	-

With (26), we would first predict that there are certain languages in which anaphors may either be locally or minimally bound (A) and also assume that certain anaphors may be neither locally nor

minimally bound (C). Language types B and D correspond to the two types already given in table (25).

At first sight, it seems reasonable to at least include language type C into our consideration. This is so because long-distance anaphors, e.g. anaphors which have to be bound eventually, but may be bound by a subset of all o-commanding elements, are well attested in the languages of the world. In (27) and (28), we show illustrations from Portuguese (Branco/Marrafa 1997) and Mandarin Chinese (Xue et al. 1994):

(27) O   Pedro$_i$ convenceu a Ana de [que o Carlos$_j$ gosta dele próprio$_{i/j}$].
    Pedro   convinced   Ana of that Carlos likes him/himself

(28) Zhangsan$_i$ zhidao [Lisi$_j$ renwei [Wangwu$_k$ zui xihuan ziji$_{i/j/k}$]]
    Z.   know   L. think W.   most like self

In Portuguese, *ele próprio* can be bound by any o-commanding subject, and similar considerations hold for *ziji* in Mandarin Chinese. It should be noted, however, that both languages make use of a short distance anaphor in addition to the long distance anaphors illustrated in (27) and (28). Interestingly, these short distance anaphors are morphologically different from their long-distance counterparts. The latter can thus be distinguished from the former morphologically, just like pronouns can be distinguished (at least in certain forms of their paradigm) from anaphors, as is illustrated in (29) and (30).[13]

(29) O   Pedro$_i$ convenceu a Ana de [que o Carlos$_j$ gosta si próprio$_{*i/j}$].
    Pedro   convinced   Ana of that Carlos likes himself

(30) Zhangsan$_i$ zhidao [Lisi$_j$ renwei [Wangwu$_k$ zui xihuan ta-ziji$_{*i/*j/k}$]]
    Z.   know   L. think W.   most like self

If short-distance and long-distance anaphors can already be distinguished morphologically, it seems reasonable to assume that the distribution of long-distance anaphors is not governed by the conditions which constrain the realization of their short-distance cousins. This conclusion has already been reached indepedently by various authors working on long-distance anaphors. Thus, both Xue et al. (1994) and Branco/Marrafa (1997) make use of an independent Principle D to cover long-distance anaphors whereas short-distance anaphors are covered by Principle A. In other terms, we do not assume that long-distance anaphors fall under the term *anaphor* as used here and consequently, they are not subject to Principle A. Given this setting, we see no reason to complicate the proximity parameter as sketched in (26). Instead, we restrict ourselves to the more concise characterization in (24) and (25) which allows for anaphors to be either bound locally or minimally.

4.4 Prospects

To sum up, we may propose a universal Principle A as given in (31) from which language-specific versions may be determined by fixing the three parameters presented above.

(31) Principle A:
    A certain set of anaphors has to be bound in a certain proximity by a potential binder.

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[13] It should also be noted that short-distance anaphors in Portuguese are not more complex than long-distance ones, but that they simply differ in shape: While long-distance *ele próprio* is always nominative, short-distance *si próprio* is always dative case.

From the perspective of the parameters sketched above, we find German and English at opposite ends. In English, only locally o-commanded anaphors (1. parameter: exemptness) have to be locally o-bound (3. parameter: proximity) by a referential binder (2. parameter: referentiality). In German, every anaphor (1.) has to be minimally o-bound (2.) by any potential binder.

To see the parameter space opened by the consideration presented above, let us just consider possible settings of the first and third parameter. Borrowing an idea developed in *Optimality Theory* (Prince/Smolensky 1993), we apply the concept *factorial typology* to our parameter settings: for each independent setting of each parameter, we predict a language type using the particular setting. A determination of the first and third parameter leads to six different language types, as illustrated in (32):

(32)	E	X	Y	G	Z	A
local o-command	+	-	-	-	-	+
o-command	+	+	-	-	+	+
local binding	+	+	+	-	-	-

Here E stands for English, and G stands for German. Let us consider the behavior of anaphors in the other language types predicted to exist. The least interesting language type is A. If locally o-commanded anaphors have to be minimally o-bound, a local o-binder will always be available for locally o-commanded anaphors. Hence language type A is in effect identical to E and can be ignored safely.

Language type Z says that o-commanded anaphors have to be minimally o-bound. It predicts that matrix subjects could be exempt from Principle A, since the matrix subject is not o-commanded. Apart from this difference, language type Z bears resemblance to German. Language type Y requires each anaphor to be locally o-bound. Hence, not only are exempt anaphors in subject position blocked, but also picture NP reflexives where the NP does not contain a binder. In general, language type Y does not show picture NP reflexives in the relevant sense, i.e. NPs which contain reflexives in positions where a pronoun would be acceptable as well. This language type is attested e.g. in Halkomelem (Gerdts 1988) or Jaminjung (Schultze-Berndt 2000).

Finally, the predictions with respect to language type X are quite complex. In languages of this type, Principle A receives the form in (33):

(33) *Principle A (X):*
    An o-commanded anaphor must be locally o-bound.

Since only o-commanded anaphors require a binder, subjects as well as phrases contained in subjects may be exempt from binding. In addition, an anaphor has to be bound by a local o-commander if the anaphor is o-commanded at all. Consequently, o-commanded anaphors must not be found in domains where a local o-commander is not present. Hence, picture NP reflexives in the proper sense cannot occur in object position if the subject is a suitable o-commander.

4.5 Back to German: on the notion subject

In our discussion of German, we have pointed out that minimal o-binders have to be subjects. It seems then that the set of possible binders might be further qualified by assuming that in certain languages and certain binding configurations, only subjects may count as binders. Obviously, the

notion *subject* itself needs a proper definition. In the present paper, we have used the standard definition given in HPSG: a subject is the least element on ARG-ST. This definition stands in contrast to a recent formulation by Manning/Sag (1999), where subjects are defined as least elements on *some* ARG-ST. Since ARG-STs may contain other ARG-STs in Manning and Sag's proposal, possible subjects include more elements if the latter definition is used.

The interaction of the binding principles with a proper definition of the notion *subject* can be illustrated by causative and exceptional case marking constructions in German:

(34) a. Der König$_i$ sah die Leute$_j$ für sich$_{i/j}$ arbeiten.
　　 b. Der König$_i$ ließ die Leute$_j$ für sich$_{i/j}$ arbeiten.

In (34a), we find an exceptional case marking (AcI) verb, *sehen,* whose accusative object is actually the subject of the embedded verb *arbeiten*. In (34b), we find the same structure with causative *lassen,* where the caussee again is actually the subject of the embedded verb. The interesting point is that in both cases, the embedded adjunct reflexive can be bound by both subjects, as indicated above. To accommodate for this fact, we first note that AcI and causative verbs belong to the class of coherent verbs, i.e. to the class of verbs which attract the arguments of its verbal complement (cf. Hinrichs/Nakazawa 1989, Kiss 1994). Argument attraction is normally defined on the SUBCAT list, but with the introduction of ARG-ST, we have to assume that argument attraction takes place on ARG-ST as well.[14] In an AcI or causative construction, we have thus two ARG-STs, viz. the ones given in (35). Here, (35a) is the ARG-ST of the embedded verb, while (35b) is the ARG-ST of the higher verb after *argument attraction* has taken place.

(35) a. ARG-ST: <NP$_j$>
　　 b. ARG-ST: <NP$_i$ NP$_j$ V>

In contrast to Manning/Sag (1999), we do not employ a stacked ARG-ST, where complex ARG-STs are embedded into other ARG-ST. The resulting ARG-ST after argument attraction is thus a flat list, as given in (35b). We can now see the consequences of definition (16e). According to (16e), both NP$_i$ and NP$_j$ o-command an adjunct, whose MOD-value is V. It is thus predicted that the higher subject may (and in fact, given (35b), must) bind the reflexive contained in the adjunct. But how does the the binding of the adjunct through the embedded subject come about. In the ARG-ST (35a), it does not count as a subject, since it is not the least element on this ARG-ST. It is, however, the least element on the ARG-ST in (35a). We assume that the lower coindexing in (34) is licensed by the ARG-ST (35a) and condition (16d). We see that the binding behavior of AcI and causative verbs can be analyzed without reference to stacked argument structures.

5. Summary

We have presented a comparative analysis of anaphoric binding in German and English, building on insights from Pollard/Sag (1994) and Frey (1993). In contrast to these earlier approaches, we explicitly relate the analyses to each other. While logophoricity plays a role in the grammar of English, it does not play a role for anaphoric binding in German. From a comparative viewpoint, the binding properties of these two languages follow from the selection of parameter values which have been

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[14] It should be noted here that Manning/Sag (1997) explicitly reject that ARG-ST is a semantic component of the grammar. Hence, ARG-ST must not be confused with the notion *argument structure,* as used elsewhere. Personally, I admit that I find this confusing, too.

derived from a small parameter space. Such a parameter setting may allow or prohibit exempt anaphors, and hence also the occurence of logophoric pronouns. In future work, we hope to show that the parameter settings which are neither relevant for English nor for German, can be shown to be at work in the languages of the world.

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