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# Bind Locally Indeed*

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We present new evidence supporting the generalization encoded in rule H, a rule defended in Fox (2000): this rule encodes an economy principle on pronominal binding according to which a closer binder bleeds binding by a more distant one if both would yield the same semantic representation. The evidence we discuss is based on how English reflexive pronouns behave in two different cases: one involving focus and one involving the (non)availability of phrasal stress.

*Keywords* Binding, Locality, Ellipsis, Syntax, Semantics

## Introduction

To deal with an ellipsis puzzle known as Dahl's puzzle, Fox (2000) defends the following locality principle, which elaborates on Heim (1993):

(1) *Rule H*:
A pronoun cannot be bound by an antecedent if a closer binder for this pronoun yields the same semantic representation.[2]

In this article, we discuss new evidence from English supporting this principle, based on the behavior of reflexives pronouns in cases involving focus (section 3), and with respect to Phrasal Stress (section 4). In anticipation of this evidence, we first discuss relevant properties of bound reflexives yielding strict readings in ellipsis contexts and next provide a (simplified) version of the motivation for rule H based on Dahl's puzzle.

## 1 A Clarification about Strict Readings in Ellipsis Contexts

Before turning to Dahl's puzzle, consider that the following sentence with ellipsis is ambiguous, as is well known, with the two readings indicated:

(2) Jack$_1$ said that he$_1$ was there before Pete$_2$ did

*To Sarah, in memoriam.

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[2]We ignore here the possible modifications discussed in Büring (2005a) or in Anand (2006), which are not relevant to our discussion.

a. = Pete$_2$ said that he$_1$ was there. *strict reading*
b. = Pete$_2$ said that he$_2$ was there. *sloppy reading*

A standard way to get this result is to postulate that the pronoun *he* is interpreted either as coreferential with *Jack* or as a variable bound by *Jack*. If the former, we get the strict reading under ellipsis, if the latter we get the sloppy reading. This simple account is insufficiently general in a crucial way – it is at best insufficient, at worst, misleading.

To see this, consider the following example, which can either be interpreted as (3a) or (3b):

(3) Nobody$_1$ can cut his$_1$ hair better than I can.
a. = Nobody$_1$ can cut his$_1$ hair better than I can cut his$_1$ hair. *strict reading*
b. = Nobody$_1$ can cut his$_1$ hair better than I can cut my hair. *sloppy reading*

The two interpretations indicated are equally natural. The interpretation in (3b) corresponds to the sloppy reading in the sense that the referential value of the pronoun in the elided VP is computed wholly within the elided VP. The interpretation in (3a) corresponds to the strict reading in the sense that the referential value of the pronoun in the elided VP depends on a binder in the non elided VP. This type of strict reading cannot be treated as a case of coreference since the antecedent of the pronoun is non referential: the pronoun in the first conjunct must be bound. This means that the ambiguity in (2) may arise whether the pronoun is bound by or coreferential with its antecedent in the first conjunct.[3]

At the very least, this means that the strict reading can arise even when the pronoun in the first conjunct is both syntactically and semantically bound.[4] This extends to reflexives: although it is well known that reflexives can yield strict readings (cf. e.g. Hestvik (1995)), such strict readings could be due to the reflexives being syntactically bound (because of, e.g., Condition A of the Binding Theory) without being interpreted as semantically bound. But this would be insufficient to explain all types of strict readings. To see this, consider the following example and its possible interpretations:

(4) Nobody$_1$ can defend himself$_1$ better than I can. *readings*
a. = Nobody$_1$ can defend himself$_1$ better than I can defend him$_1$. *strict*
b. = Nobody$_1$ can defend himself$_1$ better than I can defend myself. *sloppy*

Once again, both sloppy and strict interpretation are available even though the reflexive is both syntactically bound (again, because of Condition A) and semantically bound (as has in fact been argued to necessarily be the case for Condition A anaphors, cf. e.g. Reinhart and Reuland 1993) since its antecedent is a quantifier. The point to remember for what follows is that a pronoun or a reflexive can be both syntactically and semantically bound and yield strict readings under ellipsis (or as we will see in focus constructions).

[3]This underscores the possibility that we may never need to invoke coreferential pronouns. Of course, many questions arise which this simplified presentation does not address, which interact in complex ways with the formulation of various principles such as Rule I, see Fox (2000) and e.g. Roelofsen (2010) for recent discussion.

[4]We do not need to worry about the precise mechanism here but ellipsis resolution should at least allow such strict readings if the elided VP ends up being c-commanded by the binder of the pronoun in the first conjunct.

## 2 Dahl's Puzzle and Local Binding

This predicts that in case two bound pronouns are present in such structures, we should *prima facie* expect four different interpretations. However, Dahl (1974) remarked that when there is a sequence of two bound pronouns in a c-command relation both of which could be bound by the same name in the antecedent clause, the second pronoun in the elided clause can only receive a bound variable (i.e. sloppy) interpretation just in case the first pronoun also receives a bound variable interpretation. In other words, out of four possible interpretations of the sentence below, only the first three are available. The fourth is not:

(5) Jack$_1$ said that he$_1$ finds his$_1$ sister amusing, before Pete$_2$ did.

| | | |
|---|---|---|
| a. | = Pete$_2$ said that he$_1$ finds his$_1$ sister amusing. | *strict, strict* |
| b. | = Pete$_2$ said that he$_2$ finds his$_2$ sister amusing. | *sloppy, sloppy* |
| c. | = Pete$_2$ said that he$_2$ finds his$_1$ sister amusing. | *sloppy, strict* |
| d. | *= Pete$_2$ said that he$_1$ finds his$_2$ sister amusing. | *strict, sloppy* |

In a nutshell, Fox (2000) attributes this pattern to the effect of the principle in (1). Indeed, if we represent coreference by coindexation and variable binding relations by coindexation plus lines below, this principle predicts that all the following representations but the fourth are well formed:[5]

(6) Jack$_1$ said that he$_1$ finds his$_1$ sister amusing

a. Jack$_1$ said that he$_1$ finds his$_1$ sister amusing.

b. Jack$_1$ said that he$_1$ finds his$_1$ sister amusing.

c. Jack$_1$ said that he$_1$ finds his$_1$ sister amusing.

d. *Jack$_1$ said that he$_1$ finds his$_1$ sister amusing.

Rule H rules out (6d) because, in it, a pronoun is not locally bound, and instead yields a meaning which is indistinguishable from (6c), in which the same pronoun is locally bound. And when (6) acts as antecedent to the VP-ellipsis in *before Pete did too*, the possible binding relationships within the elided clause will parallel those within the antecedent – like (6d), (7d) is excluded:

(7) Jack$_1$ said that he$_1$ finds his$_1$ sister amusing, before Pete did.

| | | |
|---|---|---|
| a. | = Pete$_2$ said that he$_1$ finds his$_1$ sister amusing. | *strict, strict* |
| b. | = Pete$_2$ said that he$_2$ finds his$_1$ sister amusing. | *sloppy, strict* |

[5] In fact, there are two more binding possibilities: one in which both pronouns are bound by the upstairs subject, and one in which the second pronoun is bound locally by a strict interpretation of the downstairs subject. The former will be ruled out on the theoretical grounds of Rule H, which is motivated by the empirical data explored here. The latter is in fact grammatical, but is not detectably different from (6a) in sentences like the ones explored in this paper.

c. = Pete$_2$ said that he$_2$ finds his$_2$ sister amusing. *sloppy, sloppy*

d. *= Pete$_2$ said that he$_1$ finds his$_2$ sister amusing. *strict, sloppy*

This pattern found with bound pronouns is mirrored with reflexive anaphors:[6,7]

(8) Jack$_1$ said that he$_1$ finds himself$_1$ amusing, before Pete did.

a. = Pete said that Jack finds Jack amusing. *strict, strict*
b. = Pete said that Pete finds Jack amusing. *sloppy, strict*
c. = Pete said that Pete finds Pete amusing. *sloppy, sloppy*
d. *= Pete said that Jack finds Pete amusing. *strict, sloppy*

The well formedness of (8b) shows that the counterpart in the elided constituent of a reflexive in the antecedent need not end up being interpreted as (locally) bound. The ungrammaticality of (8d) is thus surprising, but is predicted by rule H in the same way as (5d) is predicted to be ungrammatical.

## 3 Support for rule H in focus constructions

A new argument, very similar to Fox's, can be based on the distribution of strict and sloppy readings in some focus constructions, instead of ellipsis. As Büring (2005b:105-8) notes, sentences involving binding, such as the one below, can have either one of the two interpretations made salient by the two denials indicated – the first one corresponding to a sloppy interpretation of the reflexive, the second to a strict interpretation of the reflexive:[8]

(9) Only Jack defended himself.

a. No, I defended myself too. *sloppy reading*
b. No, I defended him too. *strict reading*

That (9b) is available is not surprising given our discussion of (4): syntactically and semantically bound reflexives can yield strict readings.

Now consider the following sentence with two reflexives:

(10) Only Jack$_1$ assigned himself$_1$ to himself$_1$

One might expect such a sentence to be four ways ambiguous, each reflexive getting either a strict or a sloppy interpretation. Only three however are available, as illustrated by the following denials:

[6]Note that we do not use simple conjunction (e.g. *Jack said that he will hurt himself, and Pete did too*) in this example, as certain factors have been shown to interfere with a strict interpretation of reflexive anaphors or bound pronouns, e.g. syntactic factors for Hestvik (1995) or pragmatic inter-clausal relationships (e.g. Kehler's "Resemblance Coherence Relation", see Kehler 2002).

[7]Interpretations like (8b) (in which there is a sloppy interpretation on the first pronoun and a strict interpretation on the second) are degraded for certain speakers and certain sentences. Why is unclear: we leave this question open to further investigation, as this does not bear on our main point.

[8]Although Büring (2005b:141) reports both interpretations as equally available with reflexives, only certain speakers accept the strict reading, it seems.

(11) a. No, $I_2$ assigned $him_1$ to $himself_1$ too *strict, strict*
b. No, $I_2$ assigned $myself_2$ to $myself_2$ too *sloppy, sloppy*
c. No, $I_2$ assigned $myself_2$ to $him_1$ too *sloppy, strict*
d. *No, $I_2$ assigned $him_1$ to $myself_2$ too *strict, sloppy*

The unavailability of the fourth interpretation is expected under rule H. Indeed, for (11d) to be possible, the second reflexive in (10) would need to be directly dependent on the subject and not on the direct object so that this dependency is preserved if the referent of the direct object changes (as it does in (11d)). Rule H correctly blocks such a direct dependency, given that, in (10), it makes no semantic difference whether the second reflexive is bound by the subject or by the first reflexive.

## 4 Support for rule H from prosodic contours

We now turn to new empirical support for rule H involving reflexives and corroborating what (10) illustrates, based on prosodic prominence. To do so, some background is needed on phrasal stress (PS) in English and on the distribution of PS when reflexive anaphors are involved.

### *4.1 Background on phrasal stress*

Consider phrasal stress (PS) pattern, in answers to an "out-of-the blue" question such as *what happened?* or *what's new?*. In such contexts, where the "broad-focus" focus of the clause falls in the VP, PS normally falls on (the primary stress syllable of) the rightmost[9] word of a phrase, as has been observed for quite some time (Chomsky and Halle 1968, *inter alia*) – this can be illustrated by data like (12) and (14):[10]

(12) Q: What's new?
a. A: Jack hurt *Péte*.
b. #A: Jack *húrt* Pete.

Beyond out-of-the-blue contexts, placement of stress elsewhere in the sentence in (12) interacts with presupposition and discourse-givenness (Bresnan 1971; Zubizarreta 1998, *inter alia*). For example, main stress on the verb in (12b) might be appropriate to deny the presupposition that, say, Jack had *hugged* Pete – since such a presupposition is lacking in an out-of-the-blue context, the response in (12b) is infelicitous.

Thus a more refined generalization on PS (good enough for our present purpose) has PS in a phrase fall on the rightmost constituent not discourse-given or presupposed.[11] This is exemplified in (13):

[9] "Rightmost" may be a little too coarse-grained (Cinque 1993; Zubizarreta 1998, *inter alia*), but will suffice for our purposes.

[10] In all sentences, the underlined italic word bears the most prominent stress, with the acute accent mark roughly indicating the realization of the phrasal stress – typically an H* in normal declaratives (Pierrehumbert and Hirschberg 1990).

[11] This generalization has been carefully worded, so as to not entail that discourse-given or presupposed material never bears PS. (See Wagner 2006 and Ahn *in prep*.)

(13) Q: Who did Jack assign to Pete?
  a. #A: Jack assigned Liz to *Péte*
  b. A: Jack assigned *Líz* to Pete.

This generalization will thus predict the following PS pattern in a sentence where both *Jack* and *assign* are given/presupposed:

(14) Q: What assignments were made at the meeting?[12]
  a. A: Jack assigned Liz to *Péte*
  b. #A: Jack assigned *Líz* to Pete.

Despite the general robustness of this generalization, it breaks down in a variety of other syntactic environments (see e.g. Bresnan 1971; Cinque 1993; Zubizarreta 1998; Kahnemuyipour 2009). For example, when the rightmost word of the sentence is a reflexive anaphor, the rightmost word acts as "metrically invisible" (in Zubizarreta's terms) to the PS assigning mechanism. Compare (12)-(14) with (15)-(16):

(15) Q: What's new?
  a. #A: Jack hurt *himsélf*.
  b. A: Jack *húrt* himself.

(16) Q: What assignments were made at the meeting?
  a. #A: Jack assigned Liz to *himsélf*
  b. A: Jack assigned *Líz* to himself.

This state of affairs is not due to the reflexives somehow being discourse-given or presupposed; nor is it because phrase-final anaphoric pronouns cannot bear PS (as suggested by Bresnan 1971). Indeed, in other syntactic configurations, reflexive anaphors with the same level of givenness, presuppositionality and anaphoricity do bear PS:[13]

(17) Q: What assignments were made at the meeting?
  a. A: Jack assigned Liz to *hersélf*
  b. #A: Jack assigned *Líz* to herself.

(18) Q: What assignments were made at the meeting?
  a. A: Jack assigned himself to *himsélf*
  b. #A: Jack assigned *himsélf* to himself.

[12] For this question and all questions which result in an answer of A assigning B to C, the context is that one of the things that happened at the meeting was that people were assigned the job of writing an evaluation of someone.

[13] All speakers share the judgments given in (15), (17) and (18). This alone illustrates a critical point: some anaphors bear PS, while others do not. It turns out that a generalization on subject orientation, given in (19), plays a role in this; and this is shown to be the result of a syntactic derivational difference between the two (see fn 14). Some speakers prefer (16a) over (16b). For these speakers, the generalization in (19) remains true, but there are additional cases in which a phrase-final reflexive will bear PS. The grammar of these speakers needs to be accounted for, but it is uninformative regarding the issue we discuss here which rests on there being a contrast between (16) and (17).

Limiting ourselves to sentences in which a reflexive is a co-argument of some predicate, a simple generalization defended in Ahn (2011; 2012a; 2012b, *in progress*) describes the pattern of which reflexives are "metrically visible" to the PS mechanism:

(19) *Subject Orientation*:
A phrase final reflexive will bear phrasal stress in a broad focus context if it is not anteceded by the subject of its clause.

This simple generalization accounts for the range of data in (15)-(18).[14]

### *4.2 Reflexive Anaphors Bearing PS and Rule H*

We now demonstrate how granting (19), data like (20) provide new empirical support for (1), the principle of variable binding economy discussed in Fox (2000), :

(20) Q: What assignments were made at the meeting?
A: Jack assigned himself-1 to himself-2

a. A: Jack assigned himself to *himsélf*
b. # A: Jack assigned *himsélf* to himself.
c. # A: Jack *assígned* himself to himself.

Given binding requirements on reflexive anaphors, the first reflexive of the answer, *himself-1*, must be syntactically bound by the subject *Jack*. But what about the second reflexive? In principle, two equally legal representations should be available: option (21a) in which the second reflexive is bound by the first one; and option (21b) in which the second reflexive is directly bound by the subject *Jack*, bypassing local binding by *himself-1*. These options are sketched out below:

(21) $\text{Jack}_1$ assigned $\text{himself}_1$-1 to $\text{himself}_1$-2

a. $\text{Jack}_1$ assigned $\text{himself}_1$-1 to $\text{himself}_1$-2.

b. $\text{Jack}_1$ assigned $\text{himself}_1$-1 to $\text{himself}_1$-2.

Both option (21a) and (21b) are in principle available: an indirect object reflexive can be bound by a direct object as in (17), *Jack assigned Liz to herself* and an indirect object reflexive can be directly bound by the subject as in (16), *Jack assigned Liz to himself*.The existence of these two options very much recalls the situation exemplified in Dahl's puzzle: these two binding patterns yield the same meanings; rule H predicts that option (21b) should be unavailable.

[14] It is of course important to understand why (19) is true, but this will not be addressed here for reasons of space. Ahn captures this generalization by employing a theory in which subject-oriented reflexives undergo narrow-syntactic movement to a position nearer to a position of the subject of an active clause (similar to a suggestion in Chomsky 1986:175), alongside a theory in which PS is fed by syntactic embeddedness (such as Cinque 1993). Besides PS and reflexives, this captures a variety of empirical facts, including that reflexives that are coreferential with or bound by the surface subject do not behave as subject oriented (prosodically in English, morphologically in other languages) when the reflexives are, for example, in movement-islands (smaller than a clause) or in passive voice clauses.

The novel point is how the two options in (21) interact with the generalization (19). Under (21a), *himself-2* takes *himself-1* as antecedent, which is not a subject. Consequently, we expect PS will fall on *himself-2* in a broad-focus context. This is in fact attested in (20a).

If (21b) is made unavailable by rule H, we expect that *himself-2* should be unable to act as subject oriented. This prediction is borne out as shown by the infelicitous character of (20c). Indeed, if *himself-2* did have the subject as antecedent, and given that *himself-1* would also have the subject as antecedent, PS should fall on the verb, contrary to fact. Rule H thus makes a correct, and non-trivial prediction.

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