Binding theory in LFG and HSPG revisited and refined: The case of exemption
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This paper presents new results of an experiment that investigated several predictions by current Binding theories (henceforth BT). Building on and refining earlier empirical work (Keller 2000; Keller & Asudeh 2000, 2001; Runner 2003; Runner et al. 2002), the study focuses on the evaluation of several current BTs in LFG (e.g. Bresnan 2000; Dalrymple 2001) and HPSG (e.g. Asudeh 1998; Pollard & Sag 1992, 1994) with respect to the distribution of pronouns and anaphors in picture NPs (see also Everaert 2001), such as in (1).

(1) John, finally saw Mary’s picture of him/himself.

I begin by discussing the predictions of current accounts, as well as the relevant experimental studies. I then propose a revision of some components that interact with current LFG and HPSG BTs and present new empirical findings that support the proposal: Sentences like (1) are ambiguous. In one reading the possessor ‘Mary’ is construed as agent/creator and therefore bears the picture NP’s SUBJ function. In the other reading, the possessor is construed as owner and therefore doesn’t bear the picture NP’s SUBJ function. As I will show, which interpretation is chosen determines whether anaphors are grammatical in a sentence like (1).

Based on, among other things, the observation that picture NP sentences with an intervening possessor NP, as in (1), seem to be equally acceptable with anaphors and pronouns, Pollard & Sag (1994) predict that anaphors are exempt whenever they aren’t locally o-commanded (roughly corresponding to ‘outranked in the coargument domain’ in LFG terminology). Thus, if the possessor ‘Mary’ in (1) is taken to locally o-command the of-PP, the example is predicted to be ungrammatical with an anaphor. I will refer to this model as HPSG-1 (in terms of predictions this model is identical to Asudeh 1998 for whom it is the intervention of the possessor between the binder and the anaphor that make anaphors ungrammatical in (1)). If the possessor is taken to be not on the SUBCAT list and therefore does not locally o-command the anaphor, examples like (1) should be grammatical. I will refer to this model as HPSG-2. Pronouns are predicted to be grammatical in both models.

Rather than freeing anaphors from binding constraints, current LFG accounts achieve non-complementary distribution of anaphors and pronouns by means of an asymmetry in the domain constraints (here, I limit myself to accounts like Bresnan 2000, Dalrymple 2001). Anaphors must be bound within the minimal complete nucleus (i.e. the minimal f-structure containing a SUBJ function) that contains them and pronouns must be free within their minimal coargument domain (the minimal f-structure containing a PRED and all GFs it governs). Despite the conceptual differences between the HPSG and LFG approaches, they make mostly the same predictions. Crucially, for examples like (1), the predictions for anaphors depend on whether the possessor is analyzed analogous to a sentential subject. Both Dalrymple (2001:160) and Bresnan (2000:216) choose to analyze the possessor to be in a ‘subject-like’ relation to relational NPs but not as bearing the SUBJ function. This predicts that the anaphor in (1) can be bound by the subject, because the picture NP would not be a minimal complete nucleus.

Keller & Asudeh (2000, 2001) present empirical results that argue against the models summarized in column A of Table 1 (Asudeh 1998; HPSG-2) and support the models summarized in column B (Bresnan 2000; Dalrymple 2001; HPSG-2). Keller & Asudeh show that anaphors and pronouns are equally acceptable when bound by the subject if the picture NP’s have another argument besides the of-PP, such as the possessor in (1). This result is summarized in column D of Table 1.

Crucially, Keller & Asudeh did not control for the reading of the genitive NP, i.e. whether the genitive NP (so far referred to as ‘possessor’ for simplicity’s sake) is construed as agent/creator of the picture NP or the owner. Neither do any of the models discussed above systematically distinguish those two readings. As I will show below, this is empirically inadequate. I present the results of an experiment showing that the distribution of anaphors and pronouns in examples like (1) differs depending on the interpretation of the genitive NP. An overview of the proposed model is given in column C of Table 1. Note that in terms of its empirical predictions, the model is a mixture of the models in column A and B. Next, I describe the proposed model.

I propose that the genitive phrase can be interpreted as SUBJect (i.e. agent/creator) of the picture NP or as POSSesor (i.e. owner). If the genitive NP is construed as bearing the SUBJ function, the picture NP constitutes a complete minimal nucleus and the anaphor must be bound within the picture NP. This predicts that it cannot be bound by the subject of the sentence. On the other hand, if the genitive NP is construed as bearing the POSS function, the picture NP does not constitute a minimal complete nucleus (I assume that the

<table>
<thead>
<tr>
<th>Possessor = agent of picture NP</th>
<th>A: HPSG-1, Asudeh 1998</th>
<th>B: HPSG-2, Bresnan, Dalrymple</th>
<th>C: Refined LFG model</th>
<th>D: Keller &amp; Asudeh</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRO &gt; *ANA</td>
<td>ANA ~ PRO</td>
<td>PRO &gt; *ANA</td>
<td>ANA ~ PRO</td>
<td></td>
</tr>
<tr>
<td>Possessor = owner of picture NP</td>
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**TABLE 1** - Binding by the subject of the clause (* = ‘ungrammatical’; ~ = ‘equally acceptable’)
SUBJ of a picture NP can optionally be suppressed by a lexical rule). This means that the anaphor can be bound from outside the picture NP (e.g. by the subject of the sentence).

To test the refined model, I conducted an experiment that controlled for the two types of readings for the genitive NP. In one type of examples, exemplified by (2), the genitive NP was realized as a salient creator (e.g. ‘Andy Warhol’) and the verb didn’t require the subject of the sentence to be interpreted as the creator. In another set of examples, exemplified by (3), verbs of creation (e.g. ‘design’, ‘draw’, ‘paint’) were used to make the subject of the sentence the creator/SUBJ of the picture NP. Furthermore, the subject was realized as a salient creator. This strongly favored a reading in which the genitive NP could not bear the SUBJ function.

(2) Lisa burned Andy Warhol’s portrait of her/herself.
(3) Andy Warhol painted Lisa’s portrait of him/himself.

A manipulation check conducted prior to the experiment guaranteed that the experimental stimuli indeed had the assumed preferred readings just described (three subjects who didn’t participate in the later main experiment read the sentences and described what they meant). To sum up, the experiment investigated whether anaphors and pronouns are equally acceptable for both readings or whether one of the readings was incompatible with anaphors (as predicted by the refined model given in column C of Table 1).

All examples were minimal pairs. The stimuli were presented in randomized order using the WebExp 2.1 experimental online software (Keller et al. 1998). The results presented in column A of Table 2 clearly confirmed that the two readings (which in Keller & Asudeh’s study formed one condition; cf. the shaded box in Table 1) differed significantly in their compatibility with anaphors bound by the subject.

<table>
<thead>
<tr>
<th>Genitive NP is:</th>
<th>Binder is:</th>
<th>A: subject of the clause</th>
<th>B: genitive NP (‘possessor’)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agent/creator of picture NP, e.g. (2)</td>
<td>PRO &gt; *ANA</td>
<td>ANA &gt; *PRO</td>
<td></td>
</tr>
<tr>
<td>Owner of picture NP, e.g. (3)</td>
<td>?ANA ~ ?PRO</td>
<td>?ANA &gt; *PRO</td>
<td></td>
</tr>
</tbody>
</table>

TABLE 2 – Results of the current study (* = ‘completely unacceptable’; ? = ‘acceptable, but not perfect’)

Note that, to be precise, it is not BT that I propose to revise. Rather I show what assumptions have to be made in order to make the current BT work for the cases discussed here. If the refinements proposed above are incorporated into LFG, the results support LFG BT (the revision could, of course, also be applied to HSGP models). Under the assumption that the POSS function - like the SUBJ function - is part of the picture NP’s coargument domain, the results also confirm the prediction that, in examples like (2) and (3), pronouns cannot be bound by the genitive NP (cf. column B in Table 2).

The study presented here therefore successfully addresses a subtle but crucial difference between several theories of binding. Interestingly, the model supported by the results also provides an explanation for the intuitions that underlie the two original models (cf. column A and B in Table 1): each of the original models gets half of the data right (probably because the researchers were thinking of only one of the two possible readings). Finally, the results of Keller & Asudeh’s (2000, 2001) results have been crucially refined in theoretically relevant aspects. If time permits further results from the current experiment may be presented.

Selected references