Chapter 21

Anaphoric Binding

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This chapter is an introduction into the Binding Theory assumed within HPSG. While it was inspired by work on Government & Binding in the beginning, it turned out that reference to tree structures are not necessary and that relations that are required for interpreting the reference of personal pronouns and reflexives can be established with respect to lexical properties of heads namely the argument structure list, a list containing descriptions of arguments of a head.

1 Introduction

Binding Theories deal with questions of coreference and correspondence of forms. For example, the reflexives in (1) have to refer to the referent the NP in the same clause refers to and they have to have the same gender as the NP they are coreferent with:

(1) a. Peter$_i$ thinks that Mary$_j$ likes herself$_{*i/j/*k}$.
b. * Peter$_i$ thinks that Mary$_j$ likes himself$_{*i/*j/*k}$.
c. * Mary$_i$ thinks that Peter$_j$ likes herself$_{*i/*j/*k}$.
d. Mary$_i$ thinks that Peter$_j$ likes himself$_{*i/j/*k}$.

The indices show what bindings are possible and which ones are ruled out. For example, in (1a), *herself* cannot refer to *Peter*, it can refer to *Mary* and it cannot

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refer to some discourse referent that is not mentioned in the sentence. Coreference of *himself* and *Mary* is ruled out in (1b) since *himself* has an incompatible gender.

Personal pronouns can not refer to an antecedent within the same clause:

(2) a. Peter$_i$ thinks Mary$_j$ that likes her$_{*i/*j/k}$.
b. Peter$_i$ thinks Mary$_j$ that likes him$_{i/*j/k}$.
c. Mary$_i$ thinks Peter$_j$ that likes her$_{i/*j/k}$.
d. Mary$_i$ thinks Peter$_j$ that likes him$_{*i/*j/k}$.

As the examples show, the pronouns *her* and *him* cannot be coreferent with the subject of *likes*. If a speaker wants to express coreference he or she has to use a reflexive pronoun as in (1).

Interestingly, the binding of pronouns is less restricted than the one of reflexives, but this does not mean that anything goes. For example, a pronoun cannot bind a full referential NP if the NP is embedded in a clause and the pronoun is in the matrix clause:

(3) a. He$_{*i/*j/k}$ thinks that Mary$_i$ likes Peter$_j$.
b. He$_{*i/*j/k}$ thinks that Peter$_i$ likes Mary$_j$.

The sentences discussed so far can be assigned a structure like the one in Figure 1. Chomsky (1981; 1986) suggested accounting for the facts by referring to the hierarchical structure in Figure 1. He uses the notion of c(onstituent)-command going back to work by Reinhart's (1976). c-command is a relation that holds between nodes in a tree. Accoring to one definition, a node Y is said to c-command another node Z, Y and Z are sisters or if a sister of Y dominates Z.[1]

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To take an example, the NP node of *John* c-commands all other nodes dominated by S. The V of *thinks* c-commands everything within the CP including the CP node, the C of *that* c-commands all nodes in S including also S and so on. The CP c-commands the *think*-V, and the *likes him*-VP c-commands the *Paul*-NP. Per definition, a Y binds Z just in case Y and Z are coindexed and Y c-commands Z. One precondition for being coindexed (in English) is that the person, number, and gender features of the involved items are compatible.

[1] "Node A c(onstituent)-commands node B if neither A nor B dominates the other and the first branching node which dominates A dominates B." Reinhart (1976: 32)

Chomsky (1986) uses another definition that allows one to go up to the next maximal projection dominating A. As of 25/02/2020 the English and German Wikipedia pages for c-command have two conflicting definitions of c-command. The English version follows Sportiche et al. (2013), whose definition excludes c-command between sisters: "Node X c-commands node Y if a sister of X dominates Y."

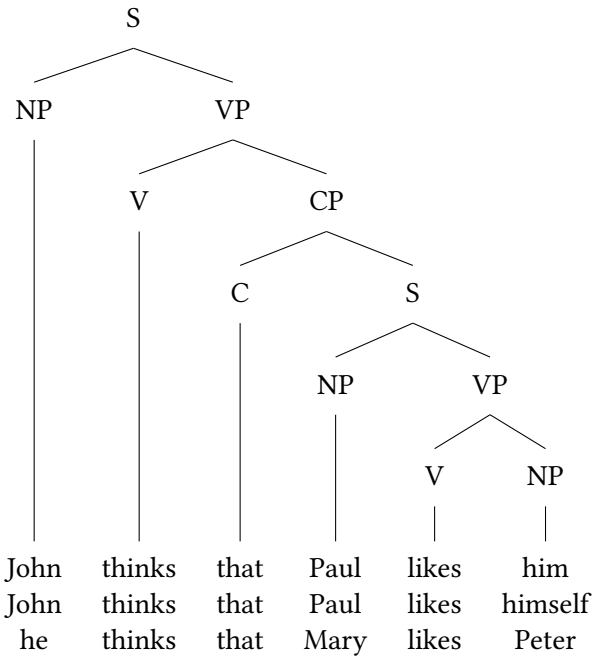

Figure 1: Tree configuration of examples for binding

Now, the goal is to find restrictions that ensure that reflexives are bound locally, personal pronouns are not bound locally and that referential expressions like proper names and full NPs do not refer to pronouns or fully referential expressions. The conditions that were developed for Binding Theory are complex. They also account for the binding of traces that are the result of moving elements by transformations. While it is elegant to subsume the filler-gap relations under a general Binding Theory, proponents of HPSG think that coreferential semantic indices and filler-gap dependencies are crucially different. The places of occurrence of gaps (if they are assumed at all) is restricted by other components of the theory. For an overview of the treatment of nonlocal dependencies in HPSG see Borsley & Crysmann (2020), Chapter 14 of this volume.

We will not go into the details of the Binding Theory in Mainstream Generative Grammar (MGG)[2], but we give a verbatim description of the ABC of

[2]We follow Culicover & Jackendoff (2005: 3) in using the term *Mainstream Generative Grammar* when referring to work in Government & Binding (Chomsky 1981) or Minimalism (Chomsky 1995).

Binding Theory for overt elements. Chomsky distinguishes between so-called R-expressions (referential expressions like proper nouns or full NPs/DPs), personal pronouns and reflexives and reciprocals. The latter two are subsumed under the term anaphor. Principle A says that an anaphor must be bound within the least maximal projection containing a subject. Principle B says that a pronoun that is governed by some element G has to be A-free in the least maximal projection M containing G and a subject. Principle C says that a referential expression Z heading its own chain has to be A-free in the domain of the head of the chain of Z.

2 A non-configural Binding Theory

(4) Let Y and Z be *synsem* objects with distinct LOCAL values, Y referential. Then Y locally o-commands Z just in case Y is less oblique than Z.

(5) Let Y and Z be *synsem* objects with distinct LOCAL values, Y referential. Then Y o-commands Z just in case Y locally o-commands X dominating Z.

(6) Y (*locally*) *o-binds* Z just in case Y and Z are coindexed and Y (locally) o-commands Z. If Z is not (locally) o-bound, then it is said to be (*locally*) *o-free*.

Principle 2 (HPSG-Bindungsprinzipien)
Prinzip A *Eine lokal o-kommandierte Anapher muß lokal o-gebunden sein.*

Prinzip B *Ein Personalpronomen muß lokal o-frei sein.*

Prinzip C *Ein Nicht-Pronomen muß o-frei sein.*

3 Reconstruction

4 Matters of order in the ARG-ST list

5 Raising and o-command

A further problem has to do with predicate complex constructions in languages like German. Researcher working on SOV languages like German, Dutch or Korean assume that the verbs form a verbal complex. The arguments of the embedded verb are attracted by the governing verb. This technique was developed in

the framework of Categorial Grammar and taken over to HPSG by Hinrichs & Nakazawa (1989; 1994). See also Godard & Samvelian (2020), Chapter 12 of this volume. Figure 2 shows the analysis of the following example:

(7) dass der Sheriff den Dieb sich überlassen wird
that the sheriff the thief self leave will
'The sheriff will leave the thief to himself.'

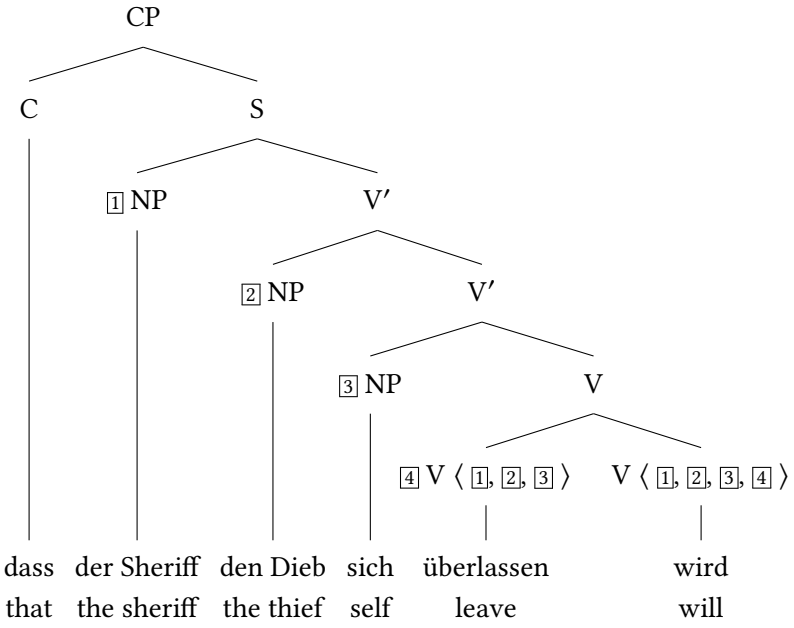

Figure 2: Analysis of a German sentence with a verbal complex

The verb *überlassen* 'to leave' is ditransitive and takes a nominative (1), a dative (2), and an accusative argument (3). A verb selecting another verb for verbal complex formation takes over the argument of the embedded verb. The auxiliary *wird* 'will' selects *überlassen* 'to leave' (4) and the arguments of *überlassen* (1, 2, 3). The ARG-ST list of *wird* contains *den Dieb* and *sich* and hence *den Dieb* locally o-binds *sich*, but *sich* also binds *den Dieb* since *sich* (3) is less-oblique than the verbal complement 4 and 4 selects for *den Dieb* (2). For the latter reason, Principle C is violated.

Kiss95a:33 Der Junge ließ das Mädchen das Boot für sich reparieren.

Abbreviations

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Part III

Other levels of description