

Semantic Effects of Focus on Modifiers in Complement Clauses*

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ABSTRACT.

We investigate the semantic effects of focus in complement clauses of various kinds of complement-taking predicates and argue that the empirically attested readings are predicted by the interplay of two principles: (i) embedded focus locally triggers the presupposition that the existential closure of the background is true, (ii) embedding predicates differ in their presupposition projection profile.

1 Introduction

In the past three decades several formal theories of focus interpretation have been developed that significantly contributed to our understanding of this important linguistic phenomenon. However, most theories concentrate on either unembedded occurrences of focus or on the semantics of focus-sensitive elements (like *only* or *even* and their counterparts in other languages). The behavior of focus in embedded positions has been largely ignored or (often implicitly) assumed to automatically fall out of a general theory of focus.

To our knowledge Dretske (1972) was the first to point out that accent placement in clausal complements can have truth-conditional effects. The sentences in (1a) and (1b) are identical except for their focus structure, yet in a context like (2) they differ in truth value: (1a) is true, but (1b) is false in that context.¹

- (1) a. Tom explained why Alice [SENT]_F Bob the tickets
b. Tom explained why Alice sent [BOB]_F the tickets
- (2) Tom said: “Alice put the tickets in the mail to Bob because she was too sick to make the trip to his house.”

Our aim is to examine more systematically the semantic effects of focus placement in embedded contexts, concentrating on focused modifiers (e.g. adverbials

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¹Another early discussion of this phenomenon can be found in Boër (1979).

or attributively used adjectives) in complements of various types of propositional attitude predicates. We will concentrate on German examples, but expect that our analysis can be extended to Russian (Maria Averintseva-Klisch, p.c.) and other languages as well.

Example (3) illustrates our main empirical observation. The German sentences in (3a) and (3b) only differ in accent placement (and hence focus structure). Both (3a) and (3b) assert that Anna believes that Bea has a black cat, but only (3b) additionally presupposes that Bea does have a cat.

- (3) a. Anna glaubt dass Bea [eine schwarze Katze hat]_F
Anna believes that Bea a black cat has
- b. Anna glaubt dass Bea eine [SCHWARZE]_F Katze hat
Anna believes that Bea a black cat has
'Anna believes that Bea has a black cat'

This paper is organized as follows. In section 2 we sketch the theoretical background of our analysis, namely the presuppositional account of focus by Geurts and van der Sandt (2004) and the binding theory of presupposition, limiting the discussion to presuppositions in attitude contexts. In section 3 we will present our analysis of focus on modifiers in complement clauses. Section 4 concludes with a short summary of our main results.

2 Theoretical background

2.1 Focus and presupposition

Focusing divides the content of an utterance into two parts: focus and background. Geurts and van der Sandt (2004) propose the following principle to account for the interpretation of focus:

- (4) The Background-Presupposition Rule (BPR)
Whenever focusing gives rise to a background $\lambda x.\phi(x)$, there is a presupposition to the effect that $\lambda x.\phi(x)$ holds of some individual.

For example, (5a) contains a focus feature on 'Barbara', dividing the content of an utterance of the sentence into two parts, focus and background, as indicated in (5b). The background can be thought of as a set of alternatives, and what the BPR does, is to introduce a presupposition to the effect that one of these alternatives is true, i.e. for some individual x it holds that Anna visited x yesterday.

- (5) a. Anna visited [BARbara]_F yesterday
b. Focus: Barbara
Background: $\lambda x.$ Anna visited x yesterday
c. Presupposition (via BPR): $\exists x.$ Anna visited x yesterday

We will use the BPR in a slightly modified form: first, we will apply it at every CP level, not only at the highest CP. The effect is that embedded focus *locally* triggers a background presupposition, i.e. in an embedded position. Second, we assume that the BPR existentially binds every lambda bound variable of a given background, not only individual variables. In sum, we take the BPR in the case of embedded focus to locally trigger the presupposition that the existential closure of the background is true.

2.2 Presupposition projection and propositional attitudes

For the purpose of this paper we assume that we can capture the semantic effects of informational focus in terms of presuppositions deriving from the BPR. In order to explain the semantic effects of focus in complement clauses, we therefore have to say something about the behavior of presuppositions in embedded contexts.

One of the most successful theories of presupposition to date is the binding theory, originally developed by van der Sandt (1992) and Geurts (1999) and typically implemented in the framework of Discourse Representation Theory (DRT) (Kamp and Reyle 1993; Kamp, van Genabith, and Reyle 2003). The basic idea is that presuppositions are looking for antecedents in the previous discourse, quite similar to anaphoric elements. (In fact, anaphors are analysed as a special kind of presuppositions in this account.)

In presuppositional DRT, the interpretation of a sentence involves several steps: first, a so-called “preliminary discourse representation structure (DRS)” is constructed in which all presuppositions of the sentence are represented at their triggering position. Second, the presuppositions are “resolved”, that means: if there is an accessible antecedent in the previous discourse, they are bound to it; otherwise they are accommodated as high as possible (without violating certain constraints, e.g. consistency). Third, the resulting final (presupposition-free) DRS is given a model-theoretic interpretation along the usual lines.

At first glance, presuppositions in complements of propositional attitude predicates seem to come in double packages: it can be argued that uttering a sentence like (6a) with the presupposition trigger *her cat* in the embedded clause gives rise to both presuppositions in (6b). Notice that there is an asymmetry between belief and other attitudes: whatever propositional attitude is chosen as the matrix predicate in (6a), the *i*-presupposition in (6b) will always be about a belief relation.

- (6) a. Anna believes/hopes/doubts that her cat is sleeping
- b. e(xternal)-presupposition: Anna has a cat
- i(nternal)-presupposition: Anna believes that she has a cat

In the literature, there is no consensus yet regarding the question which of these two presuppositions is more basic. While Karttunen (1974) and Heim (1992) start

with the i-presupposition and try to derive the e-presupposition, we will side with Geurts (1999, ch.5) in this respect and treat the e-presupposition as more basic. The impression of additional i-presuppositions can then be explained via an independently motivated context-dependent plausibility principle.

3 Analysis

Equipped with the background-presupposition rule (BPR), generalized to embedded occurrences of focus, and presuppositional DRT, we are now in a position to account for the semantic effects of focus on modifiers in complement clauses. In the following subsections we will consider four types of complement-taking predicates in turn: belief predicates (e.g. *believe*, *think*), desire predicates (e.g. *want*, *hope*), factive predicates (e.g. *know*, *regret*) and utterance predicates (e.g. *say*, *whisper*).

It turns out that the exact effect of embedded focus varies with the type of the embedding predicate. However, this does not prevent a uniform analysis: we will show that these differences are readily explained by the interaction of the embedded focus presupposition (triggered by the BPR) and the general presupposition projection profile of the embedding predicate.

3.1 Belief and desire predicates

Belief is arguably the (or at least one of the) most basic propositional attitude(s) and hence a natural starting point for our analysis. Consider again (3), repeated here as (7).

- (7) a. Anna glaubt dass Bea [eine schwarze Katze hat]_F
 Anna believes that Bea a black cat has
- b. Anna glaubt dass Bea eine [SCHWARZE]_F Katze hat
 Anna believes that Bea a black cat has
 ‘Anna believes that Bea has a black cat’

Let’s consider (7b) first, where we have an (embedded) narrow focus on *schwarze* (‘black’). Our analysis is given in (8). (8a) is the preliminary DRS prior to presupposition resolution.² Via the BPR, the backgrounded material in the complement clause in (7b) introduces a presuppositional DRS (underlined). Since the presupposition cannot be bound in this context (there is no adequate antecedent available in the DRS), it will be accommodated as high as possible, in this case in the global DRS. The resulting final DRS in (8b) exactly reflects the actual reading of (7b): Bea has a cat and Anna believes that it is black.

²For expository reasons, we simplified the analysis somewhat. In particular, we introduce proper names in the global DRS from the start, although we take this to be another instance of global accommodation. Moreover, we ignore tense and aspect to keep our DRSES simple (and small).

- (8) a. [a b: Anna(a), Bea(b), believe(a,[: black(x), [x: cat(x), own(b,x)]])]
 b. [a b x: Anna(a), Bea(b), cat(x), own(b,x), believe(a,[: black(x)])]

In (7a), in contrast, the whole VP of the complement clause (*eine schwarze Katze hat* ‘has a black cat’) is in focus. Hence the BPR only triggers the trivial presupposition that Bea has some property, which is represented in (9a) by the condition ‘ $\chi(b)$ ’. The conditions ‘cat(x)’, ‘black(x)’ and ‘own(b,x)’ are now generated with an assertive status in their local DRS, hence without escape potential. The presupposition ‘ $\chi(b)$ ’ can easily be bound to any condition that involves Bea, the most likely candidate being ‘own(b,x)’. We then arrive at the DRS in (9b). The resulting reading is exactly as desired, lacking the presupposition that Bea owns a cat.

- (9) a. [a b: Anna(a), Bea(b), believe(a,[x: black(x), cat(x), own(b,x), [: $\chi(b)$]])]
 b. [a b: Anna(a), Bea(b), believe(a,[x: black(x), cat(x), own(b,x)])]

Desire predicates and the fate of presuppositions triggered in their complement clauses are a central concern of both Heim (1992) and Geurts (1999, ch.5). For our purposes, it suffices to note that desire predicates pose no special problem for our analysis. In essence, they behave just like belief predicates.

- (10) a. Anna hofft, dass Bea eine [SCHWARze]_F Katze hat
 ‘Anna hopes that Bea has a BLACK cat’
 b. Anna hofft, dass Bea [eine schwarze KATze hat]_F
 ‘Anna hopes that Bea has a black cat’

Intuitively, (10a) presupposes that Bea has a cat, while (10b) does not. The analysis is exactly parallel to the analysis of the examples in (7). (10a) triggers the presupposition that Bea has a cat which is preferably globally accommodated: the preliminary and final DRSEs are identical to the ones in (8), if we replace ‘believe’ with ‘hope’. Similarly, (10b) is completely parallel to (9): the BPR triggers the presupposition that Bea has some property that can be bound to ‘own(b,x)’, resulting in the non-presuppositional reading that Anna hopes that Bea has a cat that is black.

3.2 Factive predicates

Next we consider factive predicates, i.e. predicates that presuppose that the proposition expressed by their complement clause is true. Some German examples are *wissen* (‘to know’), *sich bewusst sein* (‘to be aware’), *bedauern* (‘to regret’), *überrascht sein* (‘to be surprised’), *glücklich sein* (‘to be glad’), *erkennen* (‘to discover’). At first glance, one could expect that focus in factive complements should have no truth-conditional effect according to a presuppositional theory of focus, because the complement clause is presupposed anyway. However, it is crucial to

realize that a presuppositional theory of focus allows backgrounded material to *leave* its original environment (via binding or non-local accommodation) and this is exactly what we take to be the source of the semantic effects of focus in factive complement clauses.

- (11) a. Anna bedauert, dass Bea [HEUte]_F nach Prag reist
 Anna regrets that Bea today to Prague travel
- b. Anna bedauert, dass Bea [heute nach PRAG reist]_F
 Anna regrets that Bea today to Prague travel
 ‘Anna regrets that Bea is traveling to Prague today’

Let’s consider (11a) first. The narrow focus on the temporal adverbial *heute* ‘today’ has a very clear semantic effect: the sentence does not simply say that Anna regrets that Bea is traveling to Prague today, but rather that Anna regrets that Bea’s traveling to Prague is happening *today*. (11a) does not entail that Anna regrets that Bea is traveling to Prague, but only that this is happening *today*.

The analysis in (12) shows that we can in fact account for this intuition formally. The preliminary DRS in (12a) contains two presuppositions: the factive presupposition triggered by the matrix predicate and the background presupposition triggered by the focus structure via the BPR. Since there is no suitable antecedent for the factive presupposition, it has to be accommodated in the global DRS. The condition ‘travel(e,b,x)’ can now serve as an antecedent for the background presupposition (i.e. it can be bound to the resolved factive presupposition). Thus we arrive at the final DRS in (12b) that is true iff there is an event of Bea traveling to Prague today and Anna regrets that this event is happening today.

- (12) a. [a b x: Anna(a), Bea(b), Prague(x), regret(a,[: today(e), [: travel(e,b,x)])],
 [e x: travel(e,b,x), today(e)]]
- b. [e a b x: Anna(a), Bea(b), Prague(x), travel(e,b,x), today(e), regret(a,[: today(e)])]

In contrast, (11b) says that Anna regrets the whole event of Bea traveling to Prague today. The analysis in (13) shows how we can account for this formally. The crucial difference to the previous example is that the embedded predicate *travel* is part of the focus, hence not presupposed and forced to stay in its local DRS. This results in the DRS given in (13b) that correctly reflects the fact that (11b) says that Anna regrets the whole event of Bea traveling to Prague today.

- (13) a. [a b x: Anna(a), Bea(b), Prague(x), regret(a,[: travel(e,b,x), today(e),
 [: χ(b)])], [e x: travel(e,b,x), today(e)]]
- b. [e a b x: Anna(a), Bea(b), Prague(x), travel(e,b,x), today(e), regret(a,[: travel(e,b,x), today(e)])]

3.3 Utterance predicates

Utterance predicates are typically considered to be presupposition plugs, i.e. presuppositions triggered by expressions in their scope are trapped there.³ For example, ‘Anna said that Bea’s cat is black’ does not presuppose that Bea has a cat. Next to the all-purpose utterance predicate *sagen* (‘to say’), there are many more specific ones in German, e.g. *flüstern* (‘to whisper’) or *schreien* (‘to scream’). For the latter, the inability of presuppositions to escape from complement clauses is especially easy to see (cf. Moltmann (1994)). This is in accord with the intuition that *neither* of the sentences in (14) presupposes that Bea has a cat.

- (14) a. Anna flüsterte, dass Bea eine [SCHWARZE]_F Katze hat
 ‘Anna whispered that Bea has a BLACK cat’
 b. Anna flüsterte, dass Bea [eine schwarze KATze hat]_F
 ‘Anna whispered that Bea has a black cat’

In fact, this is exactly what we predict, given that utterance predicates are presupposition plugs. First, consider the analysis of (14a) in (15). The BPR triggers the presupposition that Bea has a cat, that is represented accordingly in the preliminary DRS in (15a). However, this presupposition can neither be bound nor globally accommodated, because the utterance predicate ‘whisper’ acts as a presupposition plug. As a consequence, local accommodation is enforced, as shown in (15b). The resulting DRS is true iff Anna whispers that Bea has a cat that is black. This correctly captures the intuition that (14a) does not presuppose that Bea has a cat.

- (15) a. [a b: Anna(a), Bea(b), whisper(a,[: black(x), [x: cat(x), own(b,x)]])]]
 b. [a b: Anna(a), Bea(b), whisper(a,[x: black(x), cat(x), own(b,x)])]

The analysis of (14b) is given in (16). The wide (VP) focus only leads to the introduction of the weak presupposition ‘ $\chi(b)$ ’, that can be bound to ‘own(b,x)’, resulting in the DRS in (16b), which is identical to the DRS in (15b). The result is that our analysis correctly predicts that neither of the sentences (14a) and (14b) presupposes that Bea has a cat – but via different derivational routes.

- (16) a. [a b: Anna(a), Bea(b), whisper(a,[x: black(x), cat(x), own(b,x), [:
 $\chi(b)$]])]]
 b. [a b: Anna(a), Bea(b), whisper(a,[x: black(x), cat(x), own(b,x)])]

³This is connected to the fact that the semantics of utterance predicates is sensitive not only to the content of the embedded proposition but also to (certain aspects of) its *form* or other meaning dimensions (for a recent formal semantic account cf. Brasoveanu and Farkas (2007)).

4 Conclusion

To sum up, we have shown that if we generalize the background-presupposition rule (BPR) of Geurts and van der Sandt (2004) to cover embedded foci and treat the resulting presuppositions within presuppositional DRT (Geurts 1999), we can easily account for the semantic effects of focus on modifiers in complement clauses. The apparently different effects of focus under different kinds of complement-taking predicates are readily explained, if one takes their independently motivated presupposition projection profile into account.

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