

## Bundled Meanings: *extremely* in *hw*-clauses

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INTRODUCTION This paper aims to show how different levels of meaning (i.e., at-issue, conventional implicatures and presuppositions) interact and how this interaction can elegantly explain an unresolved problem involving ‘extremely’ in *hw*-clauses (i.e., clauses introduced by *how*). We claim that (1) Conventionally Implicated (CI) items carry speaker-oriented presuppositions regarding speaker knowledgeability, and (2) these presuppositions cannot be contradicted by the asserted meaning. As a consequence, the CI ‘extremely’ can only occur modifying an adjective in *hw*-clauses, when these are embedded under resolutive predicates and speaker knowledgeability is not explicitly negated.

DATA AND BACKGROUND Consider the contrasts in the sentences of (1) and (2):

- (1) a. I know how *extremely* tall Bill is.  
b. Mary knows how *extremely* tall Bill is.  
c. Mary doesn’t know how *extremely* tall Bill is.  
d. Mary told John how *extremely* tall Bill is.
- (2) a. I don’t know how (*#extremely*) tall Bill is.  
b. Mary wonders/asks how (*#extremely*) tall Bill is.

Zanutini and Portner (2003) have attempted to address these contrasts by claiming that the embedded clauses above are *wh*-exclamative sentences which include a factive (FACT) morpheme. FACT presupposes that the proposition denoted by the *hw*-clause is true. Negating this factivity renders the sentence unacceptable ((2a)). However, in order to account for (2b), they need to stipulate that verbs like ‘ask’ and ‘wonder’ are antifactive, in the sense that they cannot embed factive clauses, such as exclamatives. Castroviejo (2008) proposes that the embedded *hw*-clauses in (1) and (2) are not exclamatives, but interrogatives, and that the ungrammaticality of (2a) can be derived from the explicit lack of speaker knowledgeability, which is required to license ‘extremely’. This account cannot explain the unacceptability of (2b): in no way is the speaker knowledgeability challenged and, yet, the sentence is unacceptable. In what follows we propose a more principled account for the data in (1) and (2).

ANALYSIS Following Castroviejo (2008), we take ‘extremely’ in the particular configuration exemplified by (1) and (2) to be a non-restrictive modifier. This means that an example like (1b) would have the paraphrase in (3b) and not the one in (3a):

- (3) a. *#* Mary knows to what degree Bill is *extremely* tall.

RESTRICTIVE MODIFICATION

- b. Mary knows to what degree Bill is tall, and I believe he is *extremely* tall.

NON-RESTRICTIVE MODIFICATION

We analyze this non-restrictive modifier as a function that takes at-issue meaning as input and returns expressive meaning. In other words, it conveys meaning at the CI level. In particular, ‘extremely’ is a degree modifier of type  $\langle\langle ed \rangle, \langle et \rangle\rangle$  (Kennedy and McNally 2005), which can have as output a  $t^a$  when it conveys meaning at the at-issue level, but which has as output  $t^c$  when it conveys meaning at the CI-level, as occurs in *hw*-clauses. Let us illustrate it with an example:

- (4) I know how extremely tall Bill is.
  - a. AT-ISSUE LEVEL: I know how tall Bill is.
  - b. CI LEVEL: Bill is extremely tall.
- (5) a. AT-ISSUE LEVEL (*how* $\langle\langle ed \rangle, \langle et \rangle\rangle$  (*tall* $\langle ed \rangle$ ))( $b_e$ ):  $t^a$   
b. CI LEVEL (*extremely* $\langle\langle ed \rangle, \langle et \rangle\rangle$  (*tall* $\langle ed \rangle$ ))( $b_e$ ):  $t^c$

We explain the contrast between (1) and (2) by examining the properties of expressive items in themselves and by examining how the at-issue and CI levels of meaning interact.

a. CI items carry presuppositions: We propose that expressive items, similarly to emotive predicates like *it's amazing*, carry the presupposition that the speaker is knowledgeable (Stalnaker, 1974). We define *knowledgeability* as the property that applies to the speaker and requires that s/he knows  $p$ , where  $p$  is the proposition about which the speaker is emotional. In turn, the speaker's knowledgeability about  $p$  presupposes  $p$  to be true. The full contribution of meaning at the CI level is shown in (6).

(6) At the CI LEVEL:

- a. Semantic composition: (*extremely*<sub><<ed>, <et>></sub> (ADJECTIVE<sub><ed></sub>))( $x_e$ )
- b. Expressive meaning: The speaker is emotional about  $p$ .
- c. Presupposition 1: The speaker knows  $p$ .
- d. Presupposition 2:  $p$  is true.

These presuppositions hold both when the speaker is the grammatical subject of the sentence ((1a)) and also when s/he is not ((1b),(1c)). Denial of knowledgeability renders the sentence unacceptable ((2a)).

Evidence in favor of analyzing knowledgeability as a presupposition of the CI item comes from the 'wait a minute' test (von Stechow, 2004). The idea behind this test is that if a speaker utters a sentence with a presupposition which is not part of the shared knowledge with the addressee, the addressee can 'complain' of the fact that this part of the meaning is taken for granted, as it happens in the B response in (7). No such objection is possible if the meaning the speaker is conveying is not presupposed, but asserted. Thus, the B' answer in (7) feels incoherent. The knowledgeability meaning conveyed by 'extremely' patterns like a presupposition and passes the 'wait a minute' test, as (8) shows:

(7) A: The mathematician who proved Goldbach's Conjecture is a woman.

B: Hey, wait a minute. I had no idea that someone proved Goldbach's Conjecture.

B': # Hey, wait a minute. I had no idea that that was a woman.

(8) A: Mary doesn't know how extremely interesting Ana Karenina is.

B: Hey, wait a minute, I had no idea you had read Ana Karenina.

b. Interaction between at-issue and CI levels: The presupposition carried by the CI item cannot be contradicted by the meaning conveyed at the at-issue level: there must be a single proposition, included in the question-denotation set, which can become presupposed without conflicting with the asserted meaning. These conditions are fulfilled by the so-called *resolutive* predicates (Ginzburg, 1996), such as 'know', 'tell' or 'agree', as opposed to question-embedding predicates such as 'wonder'. (9) shows the denotation of 'know': 'know' takes a question denotation (i.e., a set of propositions) and an individual  $x$ , and yields true if there is a proposition  $p$  in the set of propositions  $Q$  such that  $p$  is accessible in all of  $x$ 's doxastic alternatives. Moreover, it is presupposed that  $p$  is true. There is, thus, a particular proposition  $p$  that is true in  $x$ 's belief worlds, which is compatible with the presupposition associated with the CI 'extremely'.

(9)  $[[\text{know}]]^w = \lambda Q: \exists p \in Q(w) [p(w)] \ \& \ \forall q \in Q(w) [q(w) \rightarrow p \subseteq q]. \ [\lambda x. \ \forall w' \in \text{DOX}_w(x) \rightarrow [p(w')]]$

Note that since it is presupposed that  $p$  is true, this meaning is not affected by negation. In (1c), the existence and truth of  $p$  continues to be presupposed and the presupposition of 'extremely' is satisfied. Consider now 'wonder'. Following Heim (1994), we take 'wonder' to mean 'want to know'. We propose the denotation in (10):

$$(10) [[\text{wonder}]]^w = \lambda Q. \lambda x. [\forall w' \in \text{BOUL}_w(x) \rightarrow [[\text{know}]](w')(Q)(x)]$$

That is, for each bouletic alternative  $w'$  of  $x$ , there is a proposition  $p$  that holds in  $w'$  and also in all worlds  $w''$  compatible with all doxastic alternatives of  $x$  in  $w'$ . That is, there is no  $p$  in  $Q(w)$  that corresponds to  $x$ 's beliefs in  $w'$ , but there are potentially different true propositions in each of the bouletic alternatives of  $x$ . The unacceptability of (1c) is caused by a clash between the presupposition of knowledgeability of 'extremely' (which requires a single proposition to be true) and the semantics of 'wonder' (in which there is no single proposition, but different true propositions in different bouletic alternatives).

**FURTHER ISSUES** Our approach also accounts for the cases in (11) and (12) in a straightforward manner.

- (11) a. John told Mary how extremely tall Bill is, # but I don't think he's extremely tall.  
 b. John told Mary how tall Bill is; specifically, he told her that Bill is extremely tall. However, I don't think he's extremely tall.
- (12) John and Mary agree on how extremely tall Bill is. # I think they are wrong about Bill's tallness, but I agree he's extremely tall.

(11a) contains a resolute verb, which in principle licenses 'extremely'. The follow-up is nonetheless unacceptable, because the content, including presuppositions, conveyed by the CI item is non-deniable (i.e., CI items are entailments). In contrast, since 'extremely' is not a CI item in (11b), the discourse is felicitous, showing that only its CI interpretation has this property. As for (12), the first sentence would be acceptable on its own. That is, 'extremely' is in principle compatible with non-factive resolute verbs, since they provide the single proposition  $p$  that knowledgeability requires. However, the follow-up in (12) shows that the speaker may not express disagreement about the proposition that resolves  $Q(w)$ , because again this clashes with the presupposition carried by the CI item according to which this proposition is true.

**CONCLUSIONS** In this paper we have addressed a particular case of interaction between levels of meaning. We have shown that non-restrictive modifiers in  $hw$ -clauses carry the same presuppositions as emotive predicates, and we have explained why they can only be included in  $hw$ -clauses embedded in resolute predicates. This simple analysis reveals the dependencies between different types of meanings: the presuppositions at one level cannot be negated ((2a)) or contradicted ((2b)) at another level or the resulting discourse is infelicitous. Moreover, this account spurs us from having two different semantics for  $hw$ -clauses (i.e., one for interrogatives and one for exclamatives).

## References

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