Bundled meanings: ‘Extremely’ in hw-clauses

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Our project

- Study the **interactions** of asserted, conventionally and conversationally implicated **meanings** in embedded *hw*-clauses.
- Explore the possibility that the contribution of **CI items** is responsible for the **exclamative** flavor of *hw*-clauses embedded in non-exclamative predicates (??).
Hw-clauses

Example

(1) a. Peter knows how (extremely) fast the TGV can travel.
    b. Mary wonders how (#extremely) intelligent her new students can be.
Claims

■ ‘Extremely’ has the properties of **expressive** items and is semantically composed at the CI TIER.

■ The meaning conveyed by the speaker at the CI TIER complies with conversational **maxims**.

■ The literal and non-literal meaning at one dimension cannot be **contradicted** at another dimension.
## Claims

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- The meaning conveyed by the speaker at the CI tier complies with conversational maxims.
- The literal and non-literal meaning at one dimension cannot be contradicted at another dimension.
Outline

1. Data
2. Background
3. Our approach
4. Further predictions
5. Conclusions
Factive verbs embed *hw*-clauses containing ‘extremely’, even when the subject is negated.

**Example**

(2) 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.
Data

Some non-factive verbs, such as ‘agree’, can also embed hw-clauses containing ‘extremely’.

Example

(3) John and Mary agree on how extremely tall Bill is.
Data

Factive verbs with negated 1st-person subjects and some non-factive predicates cannot embed hw-clauses that include ‘extremely’.

Example

(4) a. I don’t know how (#extremely) tall Bill is.
    b. Mary wonders/asks how (#extremely) tall Bill is.
‘Extremely’ can occur in exclamatives but not in interrogatives, because the former indicate extreme degree.

Exclamatives have the same denotation as interrogatives, but they have a different sentential force, because they include a factive morpheme (FAC).
Factivity: ?)

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- Exclamatives have the same denotation as interrogatives, but they have a different sentential force, because they include a factive morpheme (FAC).
Factivity: ?)

**Insight**: factivity cannot be negated.

**Example**

(5) I don’t know how (#extremely) tall Bill is.
Factivity: ?)

- **Loose ends:** ‘ask’ and ‘wonder’ are analyzed as antifactive, but they can embed factive clauses.

**Example**

(6) a. I wonder/ask how (#extremely) tall Bill is.
    b. I wonder why Bill came to the party.

- **Loose ends:** Nothing is said about the compositional semantics of ‘extremely’ with the rest of the wh-clause.
Factivity: ?)

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**Example**

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- **Loose ends:** Nothing is said about the compositional semantics of ‘extremely’ with the rest of the \(wh\)-clause.
Levels of meaning

- ?): ‘Extremely’ in $hw$-clauses behaves like a non-restrictive modifier. It is semantically composed at the CI tier and has the properties of an expressive item (???).

- ?): ‘Extremely’ in $hw$-clauses behaves as an apposition. It is presupposed that this apposition is the true instantiation of the $wh$-variable.

- ‘Extremely’ can only occur in $hw$-clauses when there is speaker knowledgeability.
Levels of meaning

- ‘Extremely’ in *hw*-clauses behaves like a **non-restrictive** modifier. It is semantically composed at the **CI tier** and has the properties of an **expressive** item (???).
- ‘Extremely’ in *hw*-clauses behaves as an **apposition**. It is **presupposed** that this apposition is the **true instantiation** of the *wh*-variable.
- ‘Extremely’ can only occur in *hw*-clauses when there is speaker **knowledgeability**.
Levels of meaning

**Insight:** by virtue of being a CI, ‘extremely’ involves speaker knowledgeability, which makes (7) a contradiction between levels of meaning.

**Example**

(7)  
# I don’t know how *extremely* tall Bill is.
Levels of meaning

Loose ends: there is no contradiction when ‘ask’ and ‘wonder’ are in the 3rd person.

Example

(8) Mary wonders/asks how (#extremely) tall Bill is.
‘Extremely’ as a CI-item

‘Extremely’ in this particular configuration is a non-restrictive modifier.

Example

(9) Mary knows how extremely tall Bill is.

a. #Mary knows to what degree Bill is [extremely tall].  
   Restrictive modification

b. Mary knows to what degree Bill is [tall] & I believe Bill is extremely tall.  
   Non-restrictive modification
‘Extremely’ as a CI-item

‘Extremely’ is an *emotive* adverb: the speaker is emotional about the degree to which \( x \) is \( \text{ADJ} \).

(10) Mary knows how extremely/surprisingly/#relatively/#fairly tall Bill is.
‘Extremely’ as a CI-item

Semantic composition

(11) a. **AT-ISSUE TIER:** \((\text{how}^{<ed>,<et>}(\text{tall}^{ed}))(b_e): t^a)\)

(?)

b. **CI TIER:** \((\text{extremely}^{<ed>,<et>})(\text{tall}^{ed}))(b_e): t^c\)

(12) **EXPRESSIVE CONTENT:** the speaker is emotional about \(p\), and \(p = b\) is tall to degree \(d\).
(Non-)literal meaning at the CI tier

At the CI TIER:

- **Literal meaning of the CI is the speaker’s side comment:**
  \[(\text{extremely} <<\text{ed},<\text{et}>>)(\text{ADJ}_e)(x_e)\]

- **Expressive content:** the speaker is emotional about \( p \), and \( p = x \) is ADJ to degree \( d \).

- **Conversational implicature:** the speaker knows \( p \), and \( p = x \) is ADJ to degree \( d \).
(Non-)literal meaning at the CI tier

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(Non-)literal meaning at the CI tier

Maxim of quality:

- Do not say what you believe to be false.
- Do not say that for which you lack adequate evidence.

“This type of implicature differs from those arising from other maxims, because it cannot be intelligently cancelled.”

Example

(13) #Pithium is radioactive, but that isn’t true nor do I believe it, nor do I have evidence for claiming that it is.
(Non-)literal meaning at the CI tier

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- Do not say what you believe to be false.
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(?, 46)

Example

(13) #Pithium is radioactive, but that isn’t true nor do I believe it, nor do I have evidence for claiming that it is.
Interaction with at-issue meaning

Requirement across levels:

- At the **At-issue tier**, an existential operator must introduce a **variable** over propositions $p$, which is compatible with the speaker’s beliefs.

- **Resolutive** (‘know’, ‘tell’, ‘agree’) but not question-embedding (‘ask’, ‘wonder’) predicates fulfill this requirement.
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Interaction with at-issue meaning
‘Know’ vs. ‘Wonder’

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[know]^w = \lambda Q \cdot \exists p \in Q(w) \ [p(w)] \ \& \ \forall q \in Q(w) \ [q(w) \rightarrow p \subseteq q].
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[\lambda x. \forall w' \in DOX_w(x) \rightarrow [p(w')]]
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[wonder]^w = \lambda Q \lambda x. [\forall w' \in BOUL_w(x) \rightarrow [[know]^{w'}(Q)(x)]]
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Interaction with at-issue meaning

Maxim of quality cannot be cancelled.

Example

(14)  
  a. I don’t know how (#extremely) tall Bill is.  
  b. Mary doesn’t know how extremely tall Bill is.

(15)  
  Contradiction in (14-a)  
  a. CI TIER: It is implicated that the speaker knows $p$.  
  b. AT-ISSUE TIER: It is asserted that the speaker doesn’t know $p$. 

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Example

(16)  
a. I don’t know how (extremely) tall Bill is.  
b. Mary doesn’t know how extremely tall Bill is.

(17)  
a. CI tier: It is implicated that the speaker knows $p$.  
b. At-issue tier: It is asserted that Mary doesn’t know $p$.  

Castroviejo and Mayol  ‘Extremely’ in $hw$-clauses
Interaction with at-issue meaning

‘Wonder’ introduces a set of possibly incompatible true propositions in the different bouletic alternatives, which may not correspond to the speaker’s actual beliefs.

Example

(18) Mary wonders how (#extremely) tall Bill is.

(19) Contradiction in (18)

a. **AT-ISSUE TIER**: For every bouletic alternative of Mary, there is a (possibly contradictory) $p$ that solves $Q(w)$.

b. **CI TIER**: The speaker cannot comment that Bill is extremely tall about every $p$. 
Interaction with at-issue meaning

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Interaction with at-issue meaning

**Piled** meanings are evaluated in the same context, whereas **concatenated** meanings are not.

**Example**

(20)  

  a. **CONCATENATED**: Bill is extremely tall, and Mary wonders how tall he is.  
  b. **PILED**: # Mary wonders how extremely tall Bill is.

In (20-a): context is updated clause by clause, and the new assertion is intersected with the previously updated context.
Interaction with at-issue meaning

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Interaction with at-issue meaning

Piled meanings are evaluated in the same context, whereas concatenated meanings are not.

**Example**

(21) a. **Concatenated**: Bill is extremely tall, and Mary wonders how tall he is.

b. **Piled**: ≠ Mary wonders how extremely tall Bill is.

In (21-b): context is updated simultaneously for all levels of meaning, and reference to variables across levels may trigger the (unacceptable) update of contradictory contents.
Non-CI ‘extremely’

Example

(22) 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.

About (22-a)
CI ‘extremely’ conveys that the speaker believes that Bill is extremely tall.
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About (23-b)

Non-CI ‘extremely’ is not necessarily a speaker commitment ⇒ it can be denied without incurring a contradiction.
‘Agree’

Example

(24) 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.

‘Agree’ is a resolutive **but not factive** predicate ⇒ it can license CI ‘extremely’ as long as the proposition that the subjects agree on is compatible with the speaker’s beliefs.
Benefits of our proposal

- We have argued that the contrasts discussed can be explained by appealing to the interaction of meanings at different levels.
- We have done so without needing FAC or two different clause types.
- We have elaborated on the differences between piled vs. concatenated meanings.
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Open issues

- How do variables at the CI Tier (here, \(p\)) get to be bound?
- What does it mean to know how tall/happy/stupid/short someone is?
- Why can only deadjectival adverbs modify the adjective in \(hw\)-clauses?
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Thank you!

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