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A *semantic* account of the selectional restrictions of some (anti-)rogative verbs

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Some verbs take both declarative and interrogative complements:

(1)  
   a. Bill knows that Mary left.  
   b. Bill knows whether Mary left / who left.
CLAUSE-EMBEDDING VERBS

Some verbs take both declarative and interrogative complements:

(1)  
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Others take only interrogative complements:

(2)  
   a. *Bill wonders that Mary left.  
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Yet others only declarative complements:

(3) a. Bill believes that Mary left.
    b. *Bill believes whether Mary left / who left.
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   b. Bill **knows** whether Mary left / who left.

Others take **only interrogative** complements:

(2)  
   a. *Bill **wonders** that Mary left.  
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## TWO APPROACHES

<table>
<thead>
<tr>
<th>TYPE DISTINCTION</th>
<th>UNIFORMITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Declarative/interrogative complements have different semantic types</td>
<td>Declarative/interrogative complements have the same semantic type</td>
</tr>
</tbody>
</table>
## TWO APPROACHES

### TYPE DISTINCTION

- Declarative/interrogative complements have different semantic types

<table>
<thead>
<tr>
<th></th>
<th>Selectional restrictions</th>
<th>Selectional flexibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type distinction</td>
<td>✓</td>
<td>✗</td>
</tr>
<tr>
<td>Uniformity</td>
<td>✗</td>
<td>✓</td>
</tr>
</tbody>
</table>

### UNIFORMITY

- Declarative/interrogative complements have the same semantic type
Today I will:

1 discuss a challenge for type-distinction-based accounts
2 sketch a uniform treatment of clause-embedding
3 propose an account of the selectional restrictions of anti-rogatives
4 review an account of wonder*that
• **Most previous work** assumes a type distinction:
  
  Karttunen (1977); Heim (1994); Dayal (1996); Beck and Rullmann (1999); Lahiri (2002); George (2011); Spector and Egré (2015); Uegaki (2015); among others
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Standard assumption:

- Declarative complements: type \( \langle s,t \rangle \)
- Interrogative complements: type \( \langle \langle s,t \rangle,t \rangle \)
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Standard assumption:

- Declarative complements: type $\langle s, t \rangle$
- Interrogative complements: type $\langle \langle s, t \rangle, t \rangle$

Account for selectional restrictions of (anti-)rogatives:

- anti-rogatives only take complements of type $\langle s, t \rangle$
- rogatives only take complements of type $\langle \langle s, t \rangle, t \rangle$
John knows that Mary arrived \( \langle s, t \rangle \) and he knows what she brought \( \langle \langle s, t \rangle, t \rangle \).
PROBLEM: TYPE-SHIFTING

We lose the account of *wonder* that

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We lose the account of \textit{wonder}^{*}\textit{that}

John \textbf{knows} \textit{that Mary arrived} \langle s,t \rangle \quad \text{and} \quad \text{he \textbf{knows}} \textit{what she brought} \langle \langle s,t \rangle ,t \rangle

We lose the account of \textit{believe}^{*}\textit{wh}
PROBLEM: TYPE-SHIFTING

We lose the account of \textit{wonder}^\ast \textit{that}

John \textbf{knows} that Mary arrived \langle s,t \rangle  and he \textbf{knows} what she brought \langle \langle s,t \rangle,t \rangle

We lose the account of \textit{believe}^\ast \textit{wh}

A type-based account cannot directly capture the selectional restrictions of both rogatives and anti-rogatives \textbf{at once}.
PART 2

A *uniform* treatment of clausal complements
In inquisitive semantics, both declarative and interrogative sentences denote sets of propositions.
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• Sentence meanings are always downward closed.
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We refer to maximal elements in a sentence meaning as **alternatives**.
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RESPONSIVE VERBS

\[ [\text{be certain}]^w = \lambda P_{\langle s,t \rangle} . \lambda x. \text{dox}^w_x \in P \]
(4) Mary is certain that John left.

\[\leadsto \text{True in } w \text{ iff } \text{dox}_m^w \subseteq \{w \mid \text{John left in } w\}\]
RESPONSIVE VERBS

set of resolutions of the complement

doxastic state of $x$ in $w$

$[\text{be certain}]^w = \lambda P_{\langle s,t \rangle} \cdot \lambda x. \text{dox}^w_x \in P$

(4) Mary is certain that John left.
    $\rightsquigarrow \text{True in } w$ iff $\text{dox}^w_m \subseteq \{w \mid \text{John left in } w\}$

(5) Mary is certain whether John left.
    $\rightsquigarrow \text{True in } w$ iff $\exists p \in \left\{ \{w \mid \text{John left in } w\}, \{w \mid \text{John didn’t leave in } w\} \right\}$ s.t. $\text{dox}^w_m \subseteq p$
Even though declarative and interrogative complements have the same type, they are of course still distinguishable: they come apart in their semantic properties.
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Declarative complement meanings contain only one alternative, which typically doesn’t cover the entire logical space.

Ann left.
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This captures the intuition that declaratives provide but don’t request information.

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Interrogative complement meanings contain several alternatives, which always cover the entire logical space.

Who left?
Even though declarative and interrogative complements have the same type, they are of course still distinguishable: they come apart in their semantic properties.

Interrogative complement meanings contain several alternatives, which always cover the entire logical space.

This captures the intuition that interrogatives request but don’t provide information.
PART 3

Selectional restrictions of *anti-rogative* verbs
1 Attitude verbs: e.g., believe, think, feel, expect, want, desire
2 Likelihood verbs: e.g., seem, be likely
3 Speech act verbs: e.g., claim, suggest
4 Truth-assessing verbs: e.g., be true, and be false
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Many of these have a property in common: they are neg-raising.

(6) John doesn’t believe that Mary left.
    \[ \therefore \] John believes that Mary didn’t leave.
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(6) John *doesn’t* believe that Mary left.
   ∴ John believes that Mary *didn’t* leave.

Zuber (1982): all neg-raising verbs are anti-rogative.
Neg-raising verbs come with an excluded middle presupposition (Bartsch, 1973; Gajewski, 2007).

(7) John believes that Mary left.  
    \[ \sim \text{John believes that Mary left or he believes that she didn’t leave.} \]
Neg-raising verbs come with an excluded middle presupposition (Bartsch, 1973; Gajewski, 2007).

(7) John believes that Mary left.  
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- Presupposed and asserted content logically independent.
- Together they imply that John believes Mary didn’t leave.
Neg-raising is **defeasible** (Bartsch, 1973):

(9) Bill doesn’t know who killed Caesar. Bill isn’t even sure whether or not Brutus and Caesar lived at the same time. So, naturally, Bill **doesn’t** believe Brutus killed Caesar.

又好又快 Bill believes Brutus **didn’t** kill Caesar.
STATUS OF THE EXCLUDED-MIDDLE PRESUPPOSITION

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• It can’t be a **semantic presupposition**.
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Bill believes Brutus didn’t kill Caesar.

It can’t be a semantic presupposition.

However, it can’t be purely pragmatic either, since there is no obvious semantic property determining if a verb is neg-raising (Horn, 1978).

✓ want / ✗ desire
✓ hope / ✗ hoffen

(Horn, 1978) (Gajewski, 2007)
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- Soft presuppositions are **lexical properties** of their triggers, but they arise via a **pragmatic default principle**.
- Thus, they are more **context-dependent** than semantic presuppositions.
A SOFT PRESUPPOSITION

Gajewski (2007): the excluded-middle presupposition is a soft presupposition in the sense of Abusch (2002).

- Soft presuppositions are lexical properties of their triggers, but they arise via a pragmatic default principle.
- Thus, they are more context-dependent than semantic presuppositions.
- Simons (2001)’s explicit ignorance contexts:

  (10) I don’t know whether Bill even participated in the singing contest, but if he won, he’s surely over the moon.

  (11) I don’t know whether anyone watered the plants, but if it is Mary who did it, she probably gave them too much water.
\[ \text{[believe]}^w = \lambda P_{(st,t)} \cdot \lambda x : \text{DOX}_x^w \in P \lor \text{DOX}_x^w \in \neg P . \text{DOX}_x^w \in P \]
\[
[\text{believe}]^w = \lambda P_{(st,t)} \cdot \lambda x : \begin{array}{c}
\text{DOX}_x^w \in P \\
\text{DOX}_x^w \in -P
\end{array} . \begin{array}{c}
\text{DOX}_x^w \in P
\end{array}
\]

same as \([be\ certain]\)
NEG-RAISING \textit{BELIEVE}

\[
[b\text{elieve}]^w = \lambda P_{(st,t)} \cdot \lambda x : \begin{array}{c}
\text{DOX}_x^w \in P \\
\lor \\
\text{DOX}_x^w \in \neg P
\end{array} . \text{ DOX}_x^w \in P
\]

The negation is \textit{inquisitive negation}:

\[
\neg P := \{ p \mid \forall q \in P : p \cap q = \emptyset \}
\]

For example:

\[
P = \begin{array}{c}
\bullet \\
\circ \\
\circ
\end{array} \quad \neg P = \begin{array}{c}
\circ \\
\bullet
\end{array}
\]
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\bullet \\
\bigcirc \\
\bullet \\
\end{array} \quad \neg P = \begin{array}{c}
\bigcirc \\
\bullet \\
\end{array} \]

The effect of this presupposition depends on whether \( P \) is a declarative or an interrogative complement.
If $P$ is the meaning of a declarative complement, it contains only one alternative $q$. 
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\[ P = \text{ } \]
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$$P = \begin{array}{c}
\circ \\
\circ \\
\circ 
\end{array} \quad -P = \begin{array}{c}
\circ \\
\circ 
\end{array}$$
If $P$ is the meaning of a declarative complement, it contains only one alternative $q$.

$P = \begin{array}{c}
\circ \\
\circ \\
\circ 
\end{array}$

$\neg P = \begin{array}{c}
\circ \\
\circ \\
\circ 
\end{array}$

$\text{[believe}(P)(x)]^w = 1 \text{ iff } \text{dox}_x^w \in P$

$\text{ iff } \text{dox}_x^w \subseteq q$
If $P$ is the meaning of a **declarative complement**, it contains only one alternative $q$.

$$P = \begin{array}{cc} \circ & \circ \\ \circ & \circ & \circ \end{array} \hspace{1cm} -P = \begin{array}{cc} \circ & \circ \\ \circ & \circ & \circ \end{array}$$

$$[[\text{believe}(P)(x)]^w = 1 \iff \text{dox}^w_x \in P$$

$$\quad \quad \quad \iff \text{dox}^w_x \subseteq q$$

**Soft presupposition:** $\text{dox}^w_x \in P \lor \text{dox}^w_x \in \neg P$
If $P$ is the meaning of a declarative complement, it contains only one alternative $q$.

$P = \begin{array}{c}
\circ \\
\circ \\
\circ 
\end{array}$

$\neg P = \begin{array}{c}
\circ \\
\circ \\
\circ 
\end{array}$

$\langle \text{believe}(P)(x) \rangle^w = 1 \text{ iff } \text{DOX}_x^w \in P$

$\text{iff } \text{DOX}_x^w \subseteq q$

Soft presupposition: $\text{DOX}_x^w \subseteq q \lor \text{DOX}_x^w \in \neg P$

$x$ is certain that $q$ is true
If $P$ is the meaning of a declarative complement, it contains only one alternative $q$.

\[ P = \begin{bmatrix} \circ & \circ \\ \circ & \circ \end{bmatrix} \quad \neg P = \begin{bmatrix} \circ & \circ \\ \circ & \circ \end{bmatrix} \]

\[
\begin{bmatrix} \text{believe}(P)(x) \end{bmatrix}^w = 1 \iff \text{DOX}_x^w \subseteq P \\
\iff \text{DOX}_x^w \subseteq q
\]

**Soft presupposition:** 
\[ \text{DOX}_x^w \subseteq q \lor \text{DOX}_x^w \cap q = \emptyset \]

- $x$ is certain that $q$ is true
- $x$ is certain that $q$ is false
If $P$ is the meaning of an **interrogative complement**, it covers the entire logical space.
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\circ \\
\circ \\
\circ 
\end{array}$$
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$$\begin{array}{c}
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\circ \circ \\
\circ \circ 
\end{array} \\
\end{array}$$

$$\neg P = \{\emptyset\}$$
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\[
P = \begin{array}{c}
\circ \\
\circ \\
\circ 
\end{array}
\quad
\neg P = \{\emptyset\}
\]

\[
[\text{believe}(P)(x)]^w = \text{dox}_x^w \in P
\]

**Soft presupposition:** \( \text{dox}_x^w \in P \lor \text{dox}_x^w \in \neg P \)
If \( P \) is the meaning of an **interrogative complement**, it covers the entire logical space.

\[
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\circ \\
\circ \\
\circ
\end{array}
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\emptyset \\
\emptyset \\
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**Soft presupposition:** $\text{dox}^w_x \in P \lor \text{dox}^w_x \in \{\emptyset\}$

vacuous
If $P$ is the meaning of an interrogative complement, it covers the entire logical space.

$$P = \begin{bmatrix} \emptyset \\ \emptyset \\ \emptyset \end{bmatrix} \quad \neg P = \{\emptyset\}$$

$$[\text{believe}(P)(x)]^w = \text{DOX}_x^w \in P$$

**Soft presupposition:**

- $\text{DOX}_x^w \in P$ (identical!)
- $\text{DOX}_x^w \in \{\emptyset\}$ (vacuous)

16 / 27
If $P$ is the meaning of an interrogative complement, it covers the entire logical space.

$$P = \begin{array}{c}
\circ \\
\circ \\
\circ 
\end{array}$$

$$\neg P = \{\emptyset\}$$

$$\llbracket\text{believe}(P)(x)\rrbracket^w = \text{dox}_x^w \in P$$

Soft presupposition: $$\text{dox}_x^w \in P \lor \text{dox}_x^w \in \{\emptyset\}$$

identical! vacuous

Whenever $\llbracket\text{believe}\rrbracket^w(P)(x)$ is defined, it is true. In other words, its assertive content is trivial relative to its presupposition.
The triviality is systematic: it arises independently of the specific verb meaning and the specific complement meaning—as long as the verb is neg-raising and the complement interrogative.
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- In contrast, there are also non-systematic trivialities:

  (12) Every table is a table.
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• Gajewski (2002, 2008) proposes a notion to delineate systematic from non-systematic triviality: L-analyticity.
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• Gajewski (2002, 2008) proposes a notion to delineate systematic from non-systematic triviality: L-analyticity.

• L-analyticity, he argues, manifests as ungrammaticality:

  (13) There is a/*every wooden table.
We need to distinguish between **logical vocabulary** and **non-logical vocabulary** (approximation: invariance conditions).

**logical**: every, if, is  
**non-logical**: table, brother
We need to distinguish between logical vocabulary and non-logical vocabulary (approximation: invariance conditions).

**logical:** *every, if, is*  
**non-logical:** *table, brother*

Given a sentence with LF $\alpha$, we construct a logical skeleton from $\alpha$:

1. Identify the maximal constituents of $\alpha$ containing no logical items
2. Replace each such constituent with a fresh constant of the same type
We need to distinguish between logical vocabulary and non-logical vocabulary (approximation: invariance conditions).

**logical**: every, if, is  \hspace{2cm} **non-logical**: table, brother

Given a sentence with LF $\alpha$, we construct a **logical skeleton** from $\alpha$:

1. Identify the **maximal constituents** of $\alpha$ containing **no logical items**
2. Replace each such constituent with a **fresh constant** of the same type

```
     every  table  is  a  table
  ~~~~
```

```
     every  P  is  a  Q
```

```
     there  is
     ~~~~
```

```
     there  is  every  P
```

```
     every  wooden  table
```

A sentence $S$ is **L-analytical** iff $S$’s logical skeleton receives the truth value 1 (or 0) in all interpretations in which it is defined.
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- Every table is a table.
  \[ \llbracket \text{every} \rrbracket (I(P))(I(Q)) \leadsto \text{not L-analytical} \]

- There is every wooden table.
  \[ \llbracket \text{every} \rrbracket (I(P))(\llbracket \text{there} \rrbracket) = \llbracket \text{every} \rrbracket (I(P))(D_e) \leadsto \text{L-analytical} \]
A sentence $S$ is **L-analytical** iff $S$’s logical skeleton receives the truth value 1 (or 0) in all interpretations in which it is defined.

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  $\llbracket \text{every} \rrbracket (I(P))(I(Q)) \not\rightarrow \text{not L-analytical}$

- There is every wooden table.
  
  $\llbracket \text{every} \rrbracket (I(P))(\llbracket \text{there} \rrbracket) = \llbracket \text{every} \rrbracket (I(P))(D_e) \rightarrow \text{L-analytical}$

$S$ is **ungrammatical** if its LF contains an L-analytical constituent.
To show that the systematic triviality of \textit{believe}^*\textit{wh} is a case of L-analyticity, we assume that:

1. Interrogative complements are headed by the \textbf{interrogative marker} \( ? \):

\[
[?]^w := \lambda P_{(st,t)}.P \cup \neg P
\]

\text{e.g. } [?]^w \left( \begin{array}{c}
\circ \\
\circ \\
\circ \\
\end{array} \right) = \begin{array}{c}
\circ \\
\circ \\
\end{array}
\]
To show that the systematic triviality of $\text{believe}^*wh$ is a case of L-analyticity, we assume that:

1. Interrogative complements are headed by the interrogative marker $\,^?\,$:
   \[
   [?]^w := \lambda P_{\langle st,t \rangle}. P \cup \neg P
   \]
   e.g. $[?]^w \left( \begin{array}{c} 0 \cr 0 \cr 0 \end{array} \right) = \begin{array}{c} 0 \cr 0 \cr 0 \end{array}$

2. Neg-raising attitude verbs are \textit{decomposed} at LF into two predicates: $R_{EM}$, which is common to all neg-raising attitude verbs, and $M_V$, which is specific to the respective verb:

\[
\xymatrix{ & & \sim \sim \rightarrow & & \\
John \ar[dr] & & & & John \ar[dr] \\
& \text{believes} \ar[dr] & & & \text{believes} \ar[dr] \\
& & ? \ar[dr] & & ? \ar[dr] \\
& & \text{whether Mary left} & & \text{whether Mary left} \\
& & R_{EM} \ar[ur] & & M_{\text{believe}} \ar[ur] \\
}
\]
$\mathcal{M}_V$ is a function mapping an individual $x$ to a modal base.

**e.g.**

\[
\begin{align*}
[\mathcal{M}_{\text{believe}}(j)]^w &= \text{DOX}_j^w \\
[\mathcal{M}_{\text{want}}(j)]^w &= \text{BOUL}_j^w
\end{align*}
\]
\( M_V \) is a function mapping an individual \( x \) to a **modal base**.

\[
\begin{align*}
&M_{\text{believe}}(j)^w = \text{DOX}_j^w \\
&M_{\text{want}}(j)^w = \text{BOUL}_j^w
\end{align*}
\]

\( R_{\text{EM}} \) **triggers** the EM presupposition and **connects** \( M_V \) to the subject and the complement meaning:

\[
\llbracket R_{\text{EM}} \rrbracket := \lambda M_{\langle e, st \rangle} . \lambda P_{\langle st, t \rangle} . \lambda x : M(x) \in P \lor \underline{M(x)} \in \neg P . \underline{M(x)} \in P
\]
$M_V$ is a function mapping an individual $x$ to a **modal base**.

**E.g.**

\[
\left[ M_{\text{believe}}(j) \right]^w = \text{DOX}_j^w \\
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$R_{EM}$ **triggers** the EM presupposition and **connects** $M_V$ to the subject and the complement meaning:

\[
\left[ R_{EM} \right] := \lambda M_{<e,st>}. \lambda P_{<st,t>}. \lambda x : M(x) \in P \lor M(x) \in \neg P. M(x) \in P
\]

$M_V$ is “contentful”, hence **non-logical**. $R_{EM}$ is **logical**.
1. Construct logical skeleton:

\[
\text{John} \rightarrow R_{EM} \rightarrow M_{\text{believe}} \leftarrow ? \rightarrow \text{whether Mary left}
\]
BELIEVE*WH AS L-ANALYTICITY

1. Construct logical skeleton:

```
          John
         /   \
  R_EM   M_belong
     /     \
  ?       whether Mary left
```

```
          a
         /   \       
R_EM   M_V     ?
     /     \\    
   P     
```
BELIEVE*WH AS L-ANALYTICITY

1 Construct logical skeleton:

John
\[ R_{EM} \]
\[ M_{\text{believe}} \]
\[ ? \]
\[ \text{whether Mary left} \]
\[ \sim \rightarrow \]

2 Soft presupposition: 
\[ [R(M_V)(?P)(a)] \lor [R(M_V)(\neg ?P)(a)] \]
1. Construct logical skeleton:

```
   John
     /\       ~~~
    R_{EM}   M_{believe}       a
      \   /_  R_{EM} M_{V} ? P
        /\         whether Mary left
       ?
```

2. Soft presupposition: \([R(M_V)(?P)(a)] \lor [R(M_V)(\neg ?P)(a)]\)

3. Asserted content: \([R(M_V)(?P)(a)]\)
Construct logical skeleton:

1. **Believe**

2. **Soft presupposition:** \( [R(M_V)(?P)(a)] \lor [R(M_V)(\neg ?P)(a)] \)

3. **Asserted content:** \( [R(M_V)(?P)(a)] \)
BELIEVE*WH AS L-ANALYTICITY

1. Construct logical skeleton:

```
       John
       /   \
  REM   Mbelieve ?
       /     /
whether Mary left
```

2. Soft presupposition: \[ \lnot [R(\mathcal{M}_V)(?P)(a)] \lor [R(\mathcal{M}_V)(\neg ?P)(a)] \]

3. Asserted content: \[ R(\mathcal{M}_V)(?P)(a) \]

True whenever defined = L-analytical. Hence, ungrammatical.
Attitude verbs: e.g., *believe, think, feel, expect, want, desire*

Likelihood verbs: e.g., *seem, be likely*

Speech act verbs: e.g., *claim, suggest*

Truth-assessing verbs: e.g., *be true, and be false*
OTHER ANTI-ROGATIVES

1. Attitude verbs: e.g., believe, think, feel, expect, want, desire
2. Likelihood verbs: e.g., seem, be likely
3. Speech act verbs: e.g., claim, suggest
4. Truth-assessing verbs: e.g., be true, and be false

Intuition: truth-assessing verbs operate purely on the informative content of their complement.

\[
\begin{align*}
\[\text{be true}]^w & := \lambda P. \{w\} \in P \\
\[\text{be false}]^w & := \lambda P. \{w\} \not\in P
\end{align*}
\]
1. Attitude verbs: e.g., believe, think, feel, expect, want, desire
2. Likelihood verbs: e.g., seem, be likely
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**Intuition:** Truth-assessing verbs operate purely on the informative content of their complement.

\[
\llbracket \text{be true} \rrbracket^w := \lambda P. \{w\} \in P \\
\llbracket \text{be false} \rrbracket^w := \lambda P. \{w\} \notin P
\]

So, if truth-assessing verbs take a complement which covers the entire logical space, this results in systematic triviality, too.
PART 4

Accounting for wonder*that
At least three subclasses within the class of rogative verbs (cf., Karttunen, 1977):

1. **Attitude verbs**: e.g., *wonder, be curious, investigate*

2. **Speech act verbs**: e.g., *ask, inquire*

3. **Verbs of dependency**: e.g., *depend on, be determined by*
Our treatment of \textit{wonder} is based on that of the \textit{wonder}-modality in IDEL (Ciardelli and Roelofsen, 2015).

Essentially, \textit{wonder} = \textbf{not certain} + \textbf{want to find out}.
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- To capture this, we need a representation of the things that an individual would like to know: her inquisitive state $\Sigma$. 
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Essentially, \( \text{wonder} = \text{not certain} + \text{want to find out}. \)

- To capture this, we need a representation of the things that an individual would like to know: her inquisitive state \( \Sigma \).
- \( \Sigma^w_x \), is a downward closed set of consistent information states which together cover \( \text{dox}^w_x \).

\[
\bigcup \Sigma^w_x = \text{dox}^w_x
\]
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- To capture this, we need a representation of the things that an individual would like to know: her inquisitive state $\Sigma$.
- $\Sigma^w_x$, is a downward closed set of consistent information states which together cover $\text{dox}^w_x$.

$$\bigcup \Sigma^w_x = \text{dox}^w_x$$

- For example:

$$\text{dox}^w_x = \begin{array}{c}
\text{Box 1}
\end{array} \quad \Sigma^w_x = \begin{array}{c}
\text{Box 1}
\end{array}$$
\[
[wonder]^w := \lambda P. \lambda x. \begin{cases} 
\text{DOX}_x^w \notin P \land \\
 x \text{ isn't certain} \\
\forall q \in \Sigma_x^w : q \in P \land \\
 \text{but wants to find out}
\end{cases}
\]
\[ \text{[wonder]}^w := \lambda P. \lambda x. \begin{align*} & \text{\textbf{DOX}}_x^w \notin P \quad \land \quad \forall q \in \Sigma_x^w : q \in P \\
& \text{x isn't certain} \quad \text{but wants to find out} \end{align*} \]

What happens when \textit{wonder} takes a \textbf{declarative complement} \( P \)?
\[
[wonder]^w := \lambda P. \lambda x. \begin{align*}
&\text{DOX}_x^w \not\subseteq p \\
&\text{x isn’t certain} \\
\end{align*} \land \\
\begin{align*}
&\forall q \in \Sigma_x^w : q \in P \\
&\text{but wants to find out}
\end{align*}
\]

What happens when \textit{wonder} takes a \textbf{declarative complement} \(P\)?
What happens when *wonder* takes a declarative complement $P$?

$\text{[wonder]}^w := \lambda P. \lambda x. \begin{array}{c} \text{DOX}^w_x \not\subseteq p \\
\text{x isn't certain} \end{array} \wedge \begin{array}{c} \forall q \in \Sigma^w_x : q \subseteq p \\
\text{but wants to find out} \end{array}$
What happens when \textit{wonder} takes a declarative complement \( P \)?

Intuitively:

- First conjunct: \( x \) isn’t certain that \( p \),
[wonder]_w := \lambda P. \lambda x. \text{DOX}_x^w \not\subseteq p \land \forall q \in \Sigma_x^w : q \subseteq p

What happens when wonder takes a declarative complement P?

Intuitively:

- **First conjunct:** x isn’t certain that \( p \),
- **Second conjunct:** p is entailed by all propositions that resolve the issues entertained by x—that is, x has excluded \( \neg p \).
\[ [\text{wonder}]^w := \lambda P. \lambda x. \quad \text{DOX}^w_x \not\subseteq p \quad \land \quad \forall q \in \Sigma^w_x : q \subseteq p \]

What happens when \textit{wonder} takes a \textbf{declarative complement} \(P\)?

Intuitively:

- \textbf{First conjunct:} \(x\) \textit{isn't certain that} \(p\),
- \textbf{Second conjunct:} \(p\) is entailed by all propositions that resolve the issues entertained by \(x\)—that is, \(x\) \textit{has excluded} \(\neg p\).

If \textit{wonder} takes a declarative complement, the two conjuncts in the entry for the verb always become \textbf{contradictory}.
What happens when wonder takes a declarative complement \( P \)?

Intuitively:

- **First conjunct**: \( x \) isn’t certain that \( p \),
- **Second conjunct**: \( p \) is entailed by all propositions that resolve the issues entertained by \( x \)—that is, \( x \) has excluded \( \neg p \).

If wonder takes a declarative complement, the two conjuncts in the entry for the verb always become **contradictory**.

This contradiction is **systematic** too, but is it also **L-analytical**?
• Assuming a **type distinction** between declarative and interrogative complements is **not necessary** for capturing the selectional restrictions of clause-embedding verbs.

• We have seen several examples of how these restrictions can instead be **derived** from the interplay between:
  
  • the semantic properties of the respective **complements** and
  • independently motivated features of the **embedding verbs**.
THANK YOU!


• Romoli suggests the EM inference is a **scalar implicature**.
• If we adopt this view, we can’t explain the anti-rogativity of neg-raisers in terms of “if defined, then always true.”
• We then need a modified definition of L-analyticity, appealing to **local redundancy** rather than triviality.
• Gajewski himself actually suggests such a definition:

A sentence $S$ is ungrammatical if its Logical Skeleton contains a nonlogical terminal element that is **irrelevant** to determining the semantic value of $S$. 
Why doesn’t suspending the EM presupposition fix the ungrammaticality of believe*whs?

- Because grammar, Gajewski assumes, is **blind** to the non-logical aspects of sentence meaning.
- Following Abusch, the EM presupposition arises from a **pragmatic default principle**, which can be suspended by the context.
- This **contextual information** falls into exactly the category of non-logical meaning aspects, to which grammar is blind.
- Hence, suspending the EM presupposition **doesn’t have an influence on grammaticality**.
Why don’t we treat all anti-rogative verbs like *be true*, i.e., assume that they operate purely on the informative content of their complements?

• Because to assume this for all verbs would be a stipulation.
• Which motivation do we have to assume that *believe* only operates on informative content, while *be certain* operates on inquisitive content?
• It is clear what (14) *would* mean if grammatical.

(14) *John believes whether Mary left.*

• It isn’t clear what (15) *would* mean if grammatical.

(15) *It is true whether Mary left.*
(16) John believes that Mary lives in NYC and when she moved there.

• We currently predict that (16) is grammatical.
• The reason is that the complement in (16) is a hybrid: it both conveys information and requests information.
• Our treatment of believe*wh relies on questions being uninformative though.
• This is a real problem for our account.
• One possible solution: treat conjunction of complements in terms of ellipsis.
YOU WON’T BELIEVE WH

(17) You won’t believe who won!

This is not a very productive construction.

- It is limited to believe:

  (18) *You won’t think who won!

- It is limited to wh-interrogatives:

  (19) *You won’t believe if/whether Mary won!

- Moreover, believe in this construction becomes factive.
Inquisitive negation

There is both empirical and conceptual independent support for the inquisitive negation operator:

- Conceptually, the operator is determined by exactly the same algebraic properties as the standard truth-conditional negation operator (Roelofsen, 2013).

- Empirical support comes, for instance, from the behavior of negation in sluicing constructions (AnderBois, 2014).
(20)  \( x \) asked \( \varphi \).

• It’s natural to assume that part of what (20) conveys is: \( x \) uttered a sentence \( \varphi \) which was inquisitive w.r.t. the CG in the context of utterance

• (This is something that seems to be an inherent aspect of the speech act of asking)

• This is impossible if \( \varphi \) is a declarative, because then it is bound to be non-inquisitive.
Abusch (2002, 2010) assumes that soft triggers don’t carry semantic presuppositions, but introduce sets of alternatives:

\[ \text{alt} (\text{win}) = \{ \text{win}, \text{lose} \} \]

Via pointwise composition, these alternatives manifest at the sentential level:

\[ \text{alt} (\text{Mary won}) = \{ \text{won}(m), \text{lost}(m) \} \]

A pragmatic default principle then requires the disjunction of the sentential alternatives to hold in the context of evaluation:

\[ \bigvee_{\text{alt} (\text{Mary won})} = \text{won}(m) \lor \text{lost}(m) \]

This disjunction entails the soft presupposition:

\[ (\text{won}(m) \lor \text{lost}(m)) \Rightarrow \text{participated}(m) \]
Gajewski (2007): neg-raising verbs are soft triggers.

\[
\text{\textsc{alt}(believe}(p)) = \begin{cases} 
\text{believe}(p), \\
\text{believe}(\neg p) 
\end{cases}
\]

- Then the \textbf{disjunctive closure} gives us exactly the excluded middle presupposition:

\[
\lor \text{\textsc{alt}(believe}(p)(j)) = \text{believe}(p)(j) \lor \text{believe}(\neg p)(j)
\]

- The \textbf{defeasibility} of neg-raising inferences is explained by the \textbf{default-nature} of the pragmatic principle.

- This treatment of neg-raising strikes a \textbf{balance} between context-dependence and lexical idiosyncrasy.