**SYNOPSIS**

Mayr & Romoli (2001) point out that the felicity of sentences of the form ‘\(\sim v \leftarrow s \circ w \oplus \ominus \alpha \oplus \circ \beta \ominus \circ \gamma \)’ poses a problem for theories of redundancy, which I call the Disjunction Puzzle. They propose two solutions that make crucial use of (i) incrementality and (ii) a grammatical mechanism of exhaustionification. I propose a different solution that does not require them: The Disjunction Problem arises from the assumption that redundancy and presupposition satisfaction refer to the same notion of entailment, and it disappears under an alternative assumption that redundancy is computed with respect to a notion of entailment other than presupposition satisfaction. I will make this concrete in update semantics with situations.

**Stalnakerian Redundancy**

**Redundancy**

Pragmatics eschews redundancy. (1) me: My parents live in Tokyo. you: How often do you see them? me: Not that often. (my mother lives in Tokyo.) But I have a sister in Paris, and I see her quite often.

Stalnaker’s (1974) influential ideas:

- **A context set** is the set of possible worlds compatible with the common beliefs among the discourse participants (or more precisely, what the speaker takes to be the common beliefs).
- **Stalnaker’s Principle**: Assertion of S is felicitous with respect to context set \(\mathcal{C}\) if it is contradictory or redundant with respect to \(\mathcal{C}\):
  - Assertion of S is contradictory with respect to \(\mathcal{C}\) if \(\mathcal{C} \cap \mathsf{S} = \emptyset\).
  - Assertion of S is redundant with respect to \(\mathcal{C}\) if \(\mathcal{C} \cap \mathsf{S} = \mathcal{C}\).

This accounts for (1), but not redundancy that arises within sentences:

(2) Alice is expecting a daughter, (and she is pregnant) and she is happy.

If the truth of the first conjunct is not known, (2) would not be redundant.

**Solution**: Redundancy is computed with respect to the local context at each update.

**Stalnakerian Update Semantics**

**Definition 1.** (Update rules for propositional language \(\mathcal{L}\))

\[
\begin{align*}
\phi^c & = \{ w | w \in \mathcal{L} \land \phi \} \\
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\end{align*}
\]

This semantics is **eliminative** (\(\phi \sqsubseteq \mathcal{L}\)), **distributive** (\(\phi \sqsubseteq \mathcal{L}\)) and **monotonic** (for any \(\psi \sqsubseteq \phi \sqsubseteq \psi\)) Stalnakerian redundancy is defined in terms of entailment.

**Definition 2.** (Entailment) \(\phi\) entails \(\psi\) if \(\phi^c \subseteq \mathcal{L}\). Stalnakerian redundancy is broader than entailment: \(\phi\) is redundant with respect to \(\psi\) if there’s any redundant update in processing \(\psi\).

**Definition 3.** (Stalnakerian redundancy) \(\phi\) is redundant with respect to \(\psi\) if any of the following is the case:

\[
\begin{align*}
\phi & \iff \psi \\
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\phi & \iff \psi \\
\phi & \iff \psi \\
\phi & \iff \psi \\
\phi & \iff \psi \\
\phi & \iff \psi \\
\end{align*}
\]

**Facts (proofs omitted):**

- Entailment and redundancy are persistent: If \(\psi \rightarrow \phi\), then for any \(\psi, \ldots \psi, \psi, \psi \rightarrow \phi\) and if \(\phi \rightarrow \psi\), then for any \(\psi, \ldots \psi, \psi, \psi \rightarrow \psi\).
- If \(\phi \rightarrow \psi\), then \(\psi^c \leq \phi^c\), where \(\psi^c\) contains at least one occurrence of \(\psi\).
- If \(\phi \rightarrow \psi\), then \(\psi^c \leq \phi^c\), for any \(\phi\) and for any \(\psi\).

**The Disjunction Puzzle**

Mayr & Romoli follow previous studies (Beaver 2001, Schleken 2009, a.o.) in assuming the update rule for disjunction in Def. 1.

\[
(\phi \cup \psi)^c = \phi^c \cup \psi^c.
\]

**Puzzle:** (3) should be redundant in every context, but is not felicitous:

(3) Either Mary isn’t pregnant, or she is pregnant and expecting a daughter.

The Disjunction Puzzle is triggered by \(\phi^c \cup \psi^c \leq \phi^c \wedge \psi^c\).

For any \(\phi, \psi \rightarrow \phi^c \wedge \psi^c\). Note that this problem wouldn’t arise with \(\phi \vee \psi^c \leq \phi^c \wedge \psi^c\).

The update rule for \(\leq\) is motivated by presupposition projection.


**Definition 4.** (Presupposition satisfaction) The presupposition of \(\phi\) is satisfied with respect to \(\mathcal{C} \rightarrow \phi\) if any of the following is true:

\[
\begin{align*}
\phi & \equiv \mathcal{C} \\
\phi & \equiv \mathcal{C} \\
\phi & \equiv \mathcal{C} \\
\phi & \equiv \mathcal{C} \\
\phi & \equiv \mathcal{C} \\
\phi & \equiv \mathcal{C} \\
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\phi & \equiv \mathcal{C} \\
\phi & \equiv \mathcal{C} \\
\phi & \equiv \mathcal{C} \\
\end{align*}
\]

\(\phi\) entails \(\psi\) if \(\phi\) is false in \(\psi\), i.e., \(\psi\) contains no presupposition of \(\phi\); if \(\phi\) is true in \(\psi\), it adds presuppositions in \(\psi\) and their sub-parts.

**Solving the Disjunction Puzzle**

**Definition 5.** (Two notions of entailment)

- \(\psi\) strictly entails \(\phi\) if \(\phi^c \subseteq \mathcal{C} \rightarrow \psi^c\).

Whenever \(\phi \rightarrow \psi\), then \(\phi \rightarrow \psi\) but not vice versa. Redundancy is redefined in terms of \(\rightarrow\).

- \(\phi\) is not always redundant with respect to \(\rightarrow\), because \(\phi\) might be able to add presupposing situations.

If \(\phi\) presupposes \(\psi\), its presupposition is satisfied in \(\phi^c \rightarrow \psi^c\).

Because we add sub-situations of the presupposing situations, (2) is accounted for on the assumption that an presupposing situation of ‘Alice is expecting a daughter’ contains a situation where Alice is pregnant.

**Negation and Bi-Dimensional Semantics**

If negation translates into \(\sim\), (5) is problematic.

(5) Either Alice is pregnant, or she is not pregnant and she is happy.

To solve this, we define \(\sim\) as the translation of not, and let it trigger a non-eliminative update.

- Each proposition is associated with two sets of situations: \(\mathcal{L}^+\) and \(\mathcal{L}^-\).
  - \(\mathcal{L}^+\) epiphrases \(\phi\) if either \(\phi \sqsubseteq \mathcal{L}^+\) for all \(\alpha \sqsubseteq \mathcal{L}^+\) is a minimal situation in \(\mathcal{L}^+\).
  - \(\mathcal{L}^-\) anti-epiphrases \(\phi\) if either \(\phi \sqsubseteq \mathcal{L}^-\) for all \(\alpha \sqsubseteq \mathcal{L}^-\) is a minimal situation in \(\mathcal{L}^-\).

\(\mathcal{L}^+\) is the set of presupposing situations of \(\phi\) in \(\mathcal{L}^+\).

\(\mathcal{L}^-\) is the set of epiphrases of \(\phi\) that are parts of \(\mathcal{L}^-\).

\(\phi^c\) eliminates \(\phi\) if \(\phi\) is false in \(\psi\), i.e., \(\psi\) contains no presupposition of \(\phi\); if \(\phi\) is true in \(\psi\), it adds epiphrases in \(\psi\) and their sub-parts.

**Update Semantics with Situations**


- Situations are partially ordered by \(\leq\). Maximal situations are called possible worlds.
- For each situation \(\omega\), there is a unique possible world \(\Psi(\omega)\) such that \(\omega \in \Psi(\omega)\).
- Propositions are upward-closed sets of situations: if \(\phi \leq \psi\), then \(\phi \leq \psi\).
- An epiphrase \(\phi\) is an exact witness of the truth of \(\phi\) if \(\phi\) contains irrelevant things for the truth of the \(\phi\) only.
- Either \(\phi\) is true for all \(\mathcal{L} \sqsubseteq \mathcal{L}^+\) or \(\mathcal{L}^+\) is a minimal situation in \(\mathcal{L}^+\).

\(\phi^c\) is not always redundant with respect to \(\psi^c\), because it might be able to add anti-epiphrases of \(\phi\).