IT'S NOT ALWAYS REDUNDANT TO ASSERT WHAT CAN BE PRESUPPOSED

Yasutada Sudo (University College London)

SUMMARY

Mayr & Romoli (2016) point out that the felicity of sentences of the form '$(\neg\phi \vee (\phi \wedge \psi))$' 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 exhaustification. 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 stronger notion of entailment 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 (1978) influential ideas:

- A **context set** c 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 infelicitous with respect to context set c if it is contradictory or redundant with respect to c.
  - Assertion of S is **contradictory** with respect to c if $c \cap [\![S]\!] = \varnothing$.
  - Assertion of S is **redundant** with respect to c if $c \cap [\![S]\!] = c$.

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 $\mathscr{L}$)

$$\begin{aligned} c[p] &:= \{\, w \in c \mid w \vDash p \,\} \\ c[\neg\phi] &:= c - c[\phi] \\ c[(\phi \wedge \psi)] &:= c[\phi][\psi] \\ c[(\phi \to \psi)] &:= c - (c[\phi] - c[\phi][\psi]) \\ c[(\phi \vee \psi)] &:= c[\phi] \cup c[\neg\phi][\psi] \end{aligned}$$

This semantics is **eliminative** ($c[\phi] \subseteq c$), **distributive** ($c[\phi] = \bigcup_{w\in c}(\{\, w \,\}[\phi])$) and **monotonic** (for any $c' \subseteq c$, $c'[\phi] \subseteq c[\phi]$).

Stalnakerian redundancy is defined in terms of entailment.

Definition 2. (Entailment) c *entails* ϕ ($c \vDash \phi$) if $c[\phi] = c$.

Stalnakerian redundancy is broader than entailment: ϕ is redundant with respect to c if there's any redundant update in processing $c[\phi]$.

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

$$\begin{array}{ll} \phi \equiv p \text{ and} & c \vDash p \\ \phi \equiv \neg\psi \text{ and} & c \blacktriangleright \psi \text{ or } c \vDash \phi \\ \phi \equiv (\psi \wedge \chi) \text{ and} & c \blacktriangleright \psi \text{ or } c[\psi] \blacktriangleright \chi \text{ or } c \vDash \phi \\ \phi \equiv (\psi \to \chi) \text{ and} & c \blacktriangleright \psi \text{ or } c[\psi] \blacktriangleright \chi \text{ or } c \vDash \phi \\ \phi \equiv (\psi \vee \chi) \text{ and} & c \blacktriangleright \psi \text{ or } c \blacktriangleright \neg\psi \text{ or } c[\neg\psi] \blacktriangleright \chi \text{ or } c \vDash \phi \end{array}$$

Facts (proofs omitted):

- Entailment and redundancy are persistent: If $c \vDash \phi$, then for any $\psi_1, \ldots, \psi_n$, $c[\psi_1]\cdots[\psi_n] \vDash \phi$, and if $c \blacktriangleright \phi$, then for any $\psi_1, \ldots, \psi_n$, $c[\psi_1]\cdots[\psi_n] \blacktriangleright \phi$.
- $c[\phi] \vDash \phi$ and $c[\phi] \blacktriangleright \phi$.
- If $c \blacktriangleright \phi$, then $c \blacktriangleright \Gamma[\phi]$, where $\Gamma[\phi] \in \mathscr{L}$ contains at least one occurrence of ϕ.

It then follows that $c \blacktriangleright (\phi \wedge \Gamma[\phi])$ for any c. Furthermore, if ϕ^+ entails ϕ (i.e. $c[\phi^+] \vDash \phi$ for any c), then $c \blacktriangleright (\phi^+ \wedge \Gamma[\phi])$, for any c, which accounts for for (2).

THE DISJUNCTION PUZZLE

Mayr & Romoli follow previous studies (Beaver 2001, Schlenker 2009, a.o.) in assuming the update rule for disjunction in Def. 1: $c[(\phi \vee \psi)] = c[\phi] \cup c[\neg\phi][\psi]$

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

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

The Disjunction Puzzle is triggered by $\neg\phi$ in $c[\neg\phi][\psi]$:

$$\begin{aligned} c[(\neg p \vee (p \wedge e))] &= c[\neg p] \cup c[\neg\neg p][(p \wedge e)] \\ &= c[\neg p] \cup c[\neg\neg p][p][e] \end{aligned}$$

For any c, $c[\neg\neg p] \blacktriangleright p$. Note that this problem wouldn't arise with $\dot\vee$: $c[(\phi \dot\vee \psi)] = c[\phi] \cup c[\psi]$.

The update rule for $\vee$ is motivated by **presupposition projection**.

Stalnaker's (1974, 1978) idea (adopted by Heim 1983, Beaver 2001, a.o.): Presuppositions must be redundant with respect to the local context at each update.

Definition 4. (Presupposition satisfaction) The presupposition of ϕ is satisfied with respect to c ($c \triangleright \phi$) if any of the following is true:

$$\begin{array}{ll} \phi \equiv p \text{ and} & c \vDash \text{the presupposition of } p \\ \phi \equiv (\neg\psi) \text{ and} & c \triangleright \psi \\ \phi \equiv (\psi \wedge \chi) \text{ and} & c \triangleright \psi \text{ and } c[\psi] \triangleright \chi \\ \phi \equiv (\psi \to \chi) \text{ and} & c \triangleright \psi \text{ and } c[\psi] \triangleright \chi \\ \phi \equiv (\psi \vee \chi) \text{ and} & c \triangleright \psi \text{ and } c \triangleright (\neg\psi) \text{ and } c[(\neg\psi)] \triangleright \chi \end{array}$$

Data like (4) suggest that natural language disjunction is $\vee$, not $\dot\vee$.

(4) *Either Putnam was not married or Quine was married, too.*

TWO NOTIONS OF ENTAILMENT

The Disjunction Puzzle is a by-product of the assumption that redundancy and presupposition satisfaction refer to the same notion of entailment.

Proposal: Redundancy refers to a stronger notion of entailment:

- p is redundancy with respect to c if c **strictly entails** p.
- The presupposition of p is satisfied with respect to c if c **entails** it.

Suppose $c[\neg\neg p]$ entails but does not strictly entail p.

- In (3), the second disjunct is interpreted as $c[\neg\neg p][p][e]$. p is not redundant with respect to $c[\neg\neg p]$.
- In (4), the second disjunct is interpreted as $c[\neg\neg p][q]$. The presupposition of q is satisfied with respect to $c[\neg\neg p]$.

Rationale: Assertion is about foregrounded information, while presupposition can be satisfied by backgrounded information.

UPDATE SEMANTICS WITH SITUATIONS

Situation Semantics (Kratzer 1989, 2002, 2016).

- Situations are partially ordered by $\sqsubseteq$. Maximal situations are called possible worlds.
- For each situation s, there is a unique possible world $\mathsf{w}(s)$ such that $s \sqsubseteq \mathsf{w}(s)$.
- Propositions are upward-closed sets of situations: if $s \in p$ and $s \sqsubseteq s'$, then $s' \in p$.
- An **exemplifying situation** s of p is an exact witness of the truth of p (s does not contain irrelevant things for the truth of p): Either $s' \in p$ for all $s' \sqsubseteq s$ or s is a minimal situation in p.

REBUILDING UPDATE SEMANTICS WITH SITUATIONS

- A set i of situations is *homogeneous* if for each $s, s' \in i$, $\mathsf{w}(s) = \mathsf{w}(s')$.
- For any homogeneous set i, $\mathsf{w}(i)$ is the common possible world that the situations in i belong to.
- A context set c is a set of homogeneous sets of situations. We can recover the set of possible worlds via $\{\, \mathsf{w}(i) \mid i \in c \,\} =: \mathsf{W}(c)$.
- The crucial difference from Stalnakerian Update Semantics is **non-eliminativity** (it's still distributive and monotonic). The update rule for atomic sentences does both elimination and addition.

Definition 5. (Update rules)

$$\begin{aligned} c[p] &:= \{\, i \cup {\downarrow}\mathsf{E}_{\mathsf{w}(i)}(p) \mid i \in c \wedge \mathsf{E}_{\mathsf{w}(i)}(p) \neq \varnothing \,\} \\ c[\neg\phi] &:= \{\, i \in c \mid \{\, i \,\}[\phi] = \varnothing \,\} \\ c[(\phi \wedge \psi)] &:= c[\phi][\psi] \\ c[(\phi \to \psi)] &:= c[\neg(\phi \wedge \neg(\phi \wedge \psi))] \\ c[(\phi \vee \psi)] &:= c[\phi] \cup c[\neg\phi][\psi] \end{aligned}$$

$\mathsf{E}_w(p)$ is the set of exemplifying situations of p that are parts of w. ${\downarrow}S$ is the downset $\{\, s' \mid \exists s \in S[s' \sqsubseteq s] \,\}$.

$c[p]$ eliminates $i \in c$ if p is false in $\mathsf{w}(i)$, i.e. $\mathsf{w}(i)$ contains no exemplifying situation of p; if p is true in $\mathsf{w}(i)$, it adds exemplifying situations in $\mathsf{w}(i)$ and their sub-parts.

SOLVING THE DISJUNCTION PUZZLE

Definition 6. (Two notions of entailment)

- c *entails* ϕ ($c \vDash \phi$) if $\mathsf{W}(c[\phi]) = \mathsf{W}(c)$.
- c *strictly entails* ϕ ($c \Vdash \phi$) if $c[\phi] = c$.

Whenever $c \Vdash \phi$, then $c \vDash \phi$ but not vice versa.

Redundancy is redefined in terms of $\Vdash$.

- p is not always redundant with respect to $c[\neg\neg p]$, because p might be able to add exemplifying situations.
- If q presupposes p, its presupposition is satisfied in $c[\neg\neg p][q]$.

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

NEGATION AND BI-DIMENSIONAL SEMANTICS

If negation translates into $\neg\phi$, (5) is problematic.

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

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

- Each proposition is associated with two sets of situations: p^+ and p^-.
- s **exemplifies** p if either $s' \in p^+$ for all $s' \sqsubseteq s$ or s is a minimal situation in p^+.
- s **anti-exemplifies** p if either $s' \in p^-$ for all $s' \sqsubseteq s$ or s is a minimal situation in p^-.
- $\mathsf{A}_w(p)$ is the set of anti-exemplifying situations of p in w.

Definition 7.

$$\begin{aligned} c[p]^+ &:= \{\, i \cup {\downarrow}\mathsf{E}_{\mathsf{w}(i)}(p) \mid i \in c \wedge \mathsf{E}_{\mathsf{w}(i)}(p) \neq \varnothing \,\} \\ c[p]^- &:= \{\, i \cup {\downarrow}\mathsf{A}_{\mathsf{w}(i)}(p) \mid i \in c \wedge \mathsf{A}_{\mathsf{w}(i)}(p) \neq \varnothing \,\} \end{aligned}$$

$$\begin{aligned} c[{\sim}\phi]^+ &:= c[\phi]^- \\ c[{\sim}\phi]^- &:= c[\phi]^+ \end{aligned}$$

$$\begin{aligned} c[\neg\phi]^+ &:= \{\, i \in c \mid \{\, i \,\}[\phi]^+ = \varnothing \,\} \\ c[\neg\phi]^- &:= \{\, i \in c \mid \{\, i \,\}[\phi]^- = \varnothing \,\} \end{aligned}$$

$$\begin{aligned} c[(\phi \wedge \psi)]^+ &:= c[\phi]^+[\psi]^+ \\ c[(\phi \wedge \psi)]^- &:= c[\phi]^- \cup c[\phi]^+[\psi]^- \end{aligned}$$

$$\begin{aligned} c[(\phi \to \psi)]^+ &:= c[\neg(\phi \wedge \neg(\phi \wedge \psi))]^+ \\ c[(\phi \to \psi)]^- &:= c[\neg(\phi \wedge \neg(\phi \wedge \psi))]^- \end{aligned}$$

$$\begin{aligned} c[(\phi \vee \psi)]^+ &:= c[\phi]^+ \cup c[\neg\phi]^+[\psi]^+ \\ c[(\phi \vee \psi)]^- &:= c[\phi]^-[\psi]^- \end{aligned}$$

${\sim}p$ is not always redundant with respect to $c[\neg p]$, because it might be able to add anti-exemplifying situations of p.

References: [1] Mayr & Romoli (2016) A puzzle for theories of redundancy. *Sem. & Prag.* [2] Stalnaker (1978) Assertion. In *Syntax and Semantics 9.* [3] Beaver (2001) *Presupposition and Assertion in Dynamic Semantics.* [4] Schlenker (2009) Local contexts. *Sem. & Prag.* [5] Stalnaker (1974) Pragmatic presuppositions. In *Semantics and Philosophy.* [6] Heim (1983) On the projection problem for presuppositions. *WCCFL 2.* [7] Kratzer (1989) An investigation of the lumps of thought. *Ling. & Phil.* [8] Kratzer (2002) Facts: particulars or information units? *Ling. & Phi.* [9] Kratzer (2016) Situations in Natural Language Semantics. In *Stanford Encyclopedia of Phil.*