Strengthening Conditional Presuppositions

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Presuppositions of conditionals

- If Bart talks about presuppositions, *his boss* is happy.

- *his boss* $\rightsquigarrow$ Bart has a unique boss

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  $\rightsquigarrow$ Bart has a unique boss.

- How to acccount for this?

Satisfaction Theory

- $[A](C) \quad = \quad \{w \in C|\ w(A) = 1\}$, if A is atomic
- $[\neg\phi](C) \quad = \quad C - [\phi](C)$
- $[\phi \wedge \psi](C) \quad = \quad [\psi]([\phi](C))$
- $[\Diamond\phi](C) \quad = \quad C$, if $[\phi](C) \neq \emptyset$, $\quad \emptyset$ otherwise
- $[\partial P]](C) \quad = \quad C$, if $[P](C) = C$, undefined otherwise

- $\phi \leadsto P$ iff $\forall C : [\phi](C)$ is defined: $\Rightarrow [P](C) = C$

Predictions

- $(\phi_P \wedge \psi) \rightsquigarrow P$
- $\neg\phi_P \rightsquigarrow P$
- $\Diamond\phi_P \rightsquigarrow P$

- $(\phi \wedge \psi_P) \rightsquigarrow (\phi \rightarrow P)$
- $(\phi \rightarrow \psi_P) \rightsquigarrow (\phi \rightarrow P)$

- WHY not always $\neg\phi_P \rightsquigarrow P$ and $\Diamond\phi_P \rightsquigarrow P$?
  and HOW $(\phi \rightarrow \phi_P) \rightsquigarrow P$?

Denial and modal subordination

- $\neg\phi_P \rightsquigarrow$ Somebody presupposes P
  Speaker can make clear that hearer makes a false presupposition: Denial (vd Sandt, 1990)

- Actually: $\Diamond\phi_P \rightsquigarrow \exists v \in R_{pr}(w)$: in v, P is presupposed.

- Because normally $\forall v \in R_{pr}(w) : R_{pr}(v) = R_{pr}(w)$ it follows that $\forall v \in R_p(w)$: in v, P is presupposed $\Rightarrow P$ is presupposed.

- But introspection doesn't hold after assertion of $\Diamond P$.
  '$\Diamond P$. $\Diamond\phi_P$' is ok, presupposition of second sentence is satisfied.

Strengthening $(p \to r)$ to r

- Beaver: sometimes we want conditional presuppositions:
  If Spaceman Spiff ..., he will be bothered by the fact that ....

- Karttunen & Peters: Truth conditional grounds
  $(p \to r) \equiv (\neg p \vee r)$, so $\Box\neg p$ or $\Box r$
  Appropriateness condition for conditional: $\Diamond p \quad \Rightarrow \Box r$
  But: why/when TC grounds for presuppositions?

- Soames and Beaver: Plausibility
  Strengthening because most plausible context.
  But: why/what makes one context more natural than other?
  (how could r be more plausible than weaker $p \to r$?)

Standard independence

- Intuition: $p \to r$ can be strengthened to r if p and r are mutually independent.

- 1. $\Diamond(p \land r)$
  2. $\Diamond(p \land \neg r)$
  3. $\Diamond(\neg p \land r)$
  4. $\Diamond(\neg p \land \neg r)$

- But $\Box(p \to r) \equiv \Box\neg(p \land \neg r) \equiv \neg\Diamond(p \land \neg r)$
  $\Rightarrow$ p and r cannot be independent from each other.

- Different (and weaker) notion of independence?

Independence of issues

- Claude Shannon (1948): Q *orthogonal* to Q'
  iff $E(Q \sqcap Q') = E(Q) + E(Q')$
  iff $\forall q \in Q : \forall q' \in Q' : P(q \wedge q') = P(q) \times P(q')$

- David Lewis (1988): Q orthogonal to Q'
  iff $\forall u, w \in W : \exists v \in W : \langle u, v \rangle \in Q^R$ and $\langle v, w \rangle \in Q'^R$
  iff $\forall q \in Q^P : \forall q' \in Q'^P : q \cap q' \neq \emptyset$

- Proposal: p *independent* with q in context C iff $[p?]^C$ orthogonal to $[q?]^C$ (in Lewis's sense), where
  $[p?]^C = \{\{v \in C : v \models p \text{ iff } w \models p\} : w \in C\}$.

- Notice that if $C \subseteq [p]$, then $[p?]^C = \{[p]^C\}$.

Is weaker notion of independence

- p independent with r in context C iff $[p?]^C$ orthogonal with $[r?]^C$ (in Lewis's sense)

- Is equivalent with notion proposed by Michael Franke to account for relevance conditionals
  1. $(\Diamond p \wedge \Diamond r) \rightarrow \Diamond(p \wedge r)$
  2. $(\Diamond p \wedge \Diamond \neg r) \rightarrow \Diamond(p \wedge \neg r)$
  3. $(\Diamond \neg p \wedge \Diamond r) \rightarrow \Diamond(\neg p \wedge r)$
  4. $(\Diamond \neg p \wedge \Diamond \neg r) \rightarrow \Diamond(\neg p \wedge \neg r)$

- This is a *weakening* of standard notion of independence.

Strengthening $(p \to r)$ to r

- Assertion: $p \to q_r$

- Presupposition $p \to r \quad \Rightarrow \quad \Box(p \to r) \equiv \neg\Diamond(p \wedge \neg r)$

- Assume independence: $\neg\Diamond(p \wedge \neg r) \Rightarrow (\neg\Diamond p$ or $\neg\Diamond\neg r)$
  $\Rightarrow \neg\Diamond p$ or $\neg\Diamond\neg r$

- Appropriateness condition: $\Diamond p$

$\Rightarrow \neg\Diamond\neg r \quad \equiv \quad \Box r$

Other Independence

- p independent with q iff $P(p \wedge q) = P(p) \times P(q)$

- This is equivalent with $P(q/p) = P(q)$ (iff $P(p/q) = P(q)$)

- Assume $p \rightarrow r$ is presupposed, i.e. $P(p \rightarrow r) = 1$

- Jackson (1987): Robustness. This should even be true if p turns out to be true: $P(p \rightarrow r/p) = 1$

- Notice $P(p \rightarrow r/p) = \frac{P(p \wedge (\neg p \vee r))}{P(p)} = \frac{P(p \wedge r)}{P(p)} = P(r/p)$

- By independence: $P(r/p) = P(r) \Rightarrow P(r) = 1$

First imaginable objection

- If the problem was *difficult*, then Morton isn't *the one who* solved it. $\rightsquigarrow$ Somebody solved the problem.

- If the problem was difficult, then somebody solved the problem.

- Problem: if problem was easy, it is more likely that somebody solved the problem $\rightarrow$ not independence, still presupposition.

- If the problem was *easy*, then .....

- Solution(?): clefts presupposes a question *Who solved the problem?*, or give rise to a uniqueness presupposition.

Second imaginable objection

- What if the speaker believes the antecedent to be false?
  Because $\neg\Diamond p$, $\Rightarrow$ ($\neg\Diamond p$ or $\Box r$) satisfied,
  $\Rightarrow$ strengthening to $\Box r$ not predicted.
  But the unconditional presupposition should still come out:

- If that is John, John *stopped* smoking.
  But as a matter of fact that is not John.

- Reply: confusion between belief/knowledge and presupposition
  Speaker believes $\neg p \neq$ it is presupposed (by speaker) that $\neg p$.
  In fact, if this were so, the rider would be uninformative.
  So, $\neg p$ *has* to be compatible with what is presupposed.
  This is enough to ensure strengthening.

Third imaginable objection

- What if it is *presupposed* that the antecedent is false? Because $\neg\Diamond_{presup}p$, predict that presup not strengthened. But the unconditional presupposition should still come out:

- If that were John, John would have *stopped* smoking.

- Reply: p has to be compatible with the context in which the antecedent of the counterfactual is evalutated. This context is something like $C' = C \cup C_p^*$. p and r independent in this context. We conclude $\Box_{C'}r$. Because $C \subseteq C \cup C_p^*$, it follows that $C \models \Box r$, and thus that r is presupposed.

Final imaginable objection

- $Know(j, p) \rightsquigarrow p$

- John knows that if the problem was difficult, then somebody solved it.

- Satisfaction theory predicts:
  If the problem was difficult, then somebody solved it.

- Problem: why shouldn't we strengthen it to 'somebody solved the problem'?

- Reply: independence + Grice helps!

Explaining reply

- Don't *assert* $p \rightarrow q$ if p and q are taken to be independent. If we would, it followed that $\neg\Diamond p$ or $\Box q$.

- Either appropriateness condition $\Diamond p$ is false, or (with Grice) we should have claimed shorter q.

- For similar reasons, don't assert $Know(j, p \rightarrow q)$ if John is presupposed to take p and q to be independent.

- If $Know(j, p \rightarrow q)$ asserted $\Rightarrow$ John is *not* presupposed to take p and q to be independent. Probably, because *we* don't presuppose this. But then strengthening cannot go through.

Conclusion

- I finally understand why and when vdSandt's unconditional presuppositions result.

- It is because p and r are taken to be independent.

- K&P's and S&B's proposals can be understood in terms of it,

- and the imaginable objections disappear.

- I am sure Rob agrees.