A Solution to Soames' Problem: Presuppositions, Conditionals and Exhaustification

The contrast in (1a,b) noticed by [14] (see also [15,9]) is problematic for all major theories of presupposition projection ([1,2,3,5,6,7,8,10,11,13]).

(1a) Nixon is guilty, if Haldeman is guilty too (1b) ??If Haldeman is guilty too, Nixon is guilty

There are two issues with (1a,b): (1a), contrary to (1b), is felicitous and doesn't appear to have presuppositions (FACT 1). Furthermore all theories that, like the ones mentioned above, assume that every presupposition is also an entailment of the minimal sentence that carries it wrongly predict tautological truth-conditions for (1a); a meaning that we could paraphrase as "Nixon is guilty, if both Haldeman and Nixon are guilty" (FACT 2).

I will show that a theory that doesn't make such an assumption might solve FACT 1 and FACT 2. For instance, a DRT approach plus the semantics for *too* by [17,18] can account for the felicity of (1a), but I will show that it overgenerates. In particular, it does not predict the infelicity of (1c), which can be straightforwardly accounted for in theories that do assume that presuppositions are always entailed by the minimal sentence containing the trigger. In fact, given this assumption the sentence is predicted to have a meaning that we can paraphrase as "If Nixon and Haldeman are guilty, Nixon isn't guilty", which can't be true, but in a trivial way (e.g. the falsity of the antecedent). More in general, the pair (1a,1c) constitutes a challenge for accounts of (1a) that weaken the presupposition of *too*, thereby maybe solving FACT 1 and FACT 2, but not blocking (1c) anymore.

(1c) ??Nixon is not guilty, if Haldeman is guilty too

Here I explore a different strategy: I propose a solution for both FACT 1 and FACT 2, which involves local accommodation (or equivalent operations) on the presupposition in the antecedent and exhaustification of sentence-final conditionals like (1a). This will allow a unified account of (1a) and (2), whose presuppositionless status is by the way problematic for many of the theories above and needs to be accounted for anyway. Finally, I will argue that the degraded status of (1b) is an independent fact rooted in the topic-focus structure of sentence-final conditionals.

(2) Nixon is guilty, only if Haldeman is guilty too

The problem more in details: Let's first show why (1a) is problematic for all theories mentioned above. For illustration, let's look at the prediction of a trivalent theory of presupposition projection ([2,6,5]). The basis is a strong kleene logic plus the A(-ssertion) operator in (3) and a pragmatic bridge to connect semantic undefinedness to pragmatic presuppositions ([16], see also [21, 12]).

(3) A OPERATOR: for some world w, $A(p(w)) = 1$ if $p(w) = 1$, if $p(w) \in \{0, \#\}$ then $A(p(w)) = 0$

(4) STALNAKER'S BRIDGE: p can update a context c only if $\forall w \in c(p(w) \in \{0, 1\})$

This set-up predicts symmetric filtering of presuppositions. Let's consider then two types of approaches for making the system asymmetric, one based on linear order ([8,9,4,5,6,11]) and another based on hierarchical order ([3], see also [6] and [10]). It is important to consider both here because sentence-final conditionals are precisely those cases in which the two approaches diverge (see [3,10]). I adopt [22]'s formulation of the first approach in (5) and model on it one for the second approach in (6).

(5) APPROACH A: MIDDLE-KLEENE/LINEAR ORDER: Go from left to right through the sentence. For each argument X that takes a non-classical value, check whether on the basis of material on its left, assigning an arbitrary classical value to X could conceivably have an effect on the overall value. If so, the sentence as a whole lacks a classical truth value. If not, just assign X an arbitrary value, and carry on. If this procedure allows all non-classical values to be filled in classically, then the sentence can be assigned a classical value.

(6) APPROACH B: MIDDLE-KLEENE/HIERARCHICAL ORDER: Proceed bottom up, following the semantic composition. For each function f and argument X that takes a non-classical value, check whether on the basis of any co-argument Y of f c-commanded by X, assigning a an arbitrary classical value to X could conceivably have an effect on the value of $f(Y)(X)$. *[From here same as Approach A]*

Back to Soames cases: We can now see that (1a) is problematic for both approaches. It is problematic for Approach B as the antecedent doesn't c-command the consequent, so the latter cannot filter presuppositions in the former. The case of *only if* is also problematic because, wherever *only* is merged, there is no apparent reason why it should change the relevant structural relation between antecedent and consequent. Although at first sight the contrast in (1a,b) seems to speak in favor of the linear-order based Approach A, this does not predict the presuppositionless status of (1a) either, because the filtering predicted for a sentence-final conditional $[q\ \textit{if}\ p_s]$ (analyzed as material implication) is $(\neg q \rightarrow s)$ and not $(q \rightarrow s)$, as it would be needed here to account for FACT 1. Notice that this is not an idiosyncratic prediction of the trivalent logic assumed here, but rather it is also predicted by other linear-order based theories like [10].

The solution: I propose that (1a) is a case of an exhaustified conditional, analogous to overt *only if* conditionals. Assume a standard semantics for *only* in (7a) and for a silent-only/exhaustivity operator in (7b) (see [24]).

(7a) $[\![\textbf{Only}]\!](C)(p) = \lambda w : p(w).\forall q \in C[p \nsubseteq q \rightarrow \neg q(w)]$

(7b) $[\![\textbf{EXH}]\!](Alt)(p) = \lambda w.p(w) \wedge \forall q \in Alt[p \nsubseteq q \rightarrow \neg q(w)]$

Also assume the strict conditional semantics for conditionals by [20], in which an operator GEN, indicated below as $\Box$, takes a selection function $f \in D_{s,st}$ and two propositions. This semantics in general validates contraposition and comes with an homogeneity presupposition that validates conditional excluded middle.

(8) $\Box(f)(p)(q)(w)$ defined if $\forall w' \in f(w)[p(w') \rightarrow q(w')] \vee \forall w' \in f(w)[p(w') \rightarrow \neg q(w')]$
when defined it is true in w iff $\forall w' \in f(w)[p(w') \rightarrow q(w')]$

To keep things simple consider the case in which wide focus makes it so that the alternatives in C or Alt are in (9) (the case of narrow focus can be accounted for too, see [20])

(9) $C/Alt = \left\{ \begin{array}{l} \Box(p \rightarrow q) \\ \Box(\neg p \rightarrow q) \end{array} \right\}$

(1a) and (2) are analyzed as EXH_{Alt}[q [GEN if Ap]] and Only_C[q [GEN if Ap]] respectively. The computation for the case of EXH is in (10); the case of *only if* is completely analogous, except that the tautological direction is presupposed rather than asserted.

(10) $\text{EXH}[\Box(Ap_q \rightarrow q)] = \Box(Ap_q \rightarrow q) \wedge \forall r \in Alt[\Box(Ap_q \rightarrow q) \nsubseteq r \rightarrow \neg r(w)]$

$\Box(Ap_q \rightarrow q) \wedge \neg\Box(\neg Ap_q \rightarrow q) =$	*meaning of* EXH
$\Box((p \wedge q) \rightarrow q) \wedge \neg\Box(\neg(p \wedge q) \rightarrow q) =$	*meaning of* A
$\top \wedge \Box(\neg(p \wedge q) \rightarrow \neg q) =$	*cond excl middle*
$\Box(q \rightarrow (p \wedge q))$	*contraposition*

Hence the resulting meaning for the exhaustified conditional and the *only if* is "if Nixon is guilty, both Haldeman and Nixon are guilty". In other words, it would be judged false if Nixon is guilty but Haldeman isn't. I submit that this is the correct meaning. Furthermore, the degraded status of (1b) can be derived by assuming that exhaustification needs the antecedent to be in focus and focused antecedents don't like to be in sentence-initial position ([23,19]). This seems a matter of preference, not an absolute constraint, but so appears to be the infelicity of (1b).

(11) Under what conditions will you buy this house?

(a) I'll buy this house if you give me the money (b) #If you give me the money I'll buy this house

Finally, other triggers appear to be non felicitous in these configurations, which might suggest that this is a specific phenomenon linked to additives. Notice, though, that in those cases the correspondent overt *only if* conditionals are also infelicitous. So I will argue that to the extent that one can create a context in which the sentence with *only if* is felicitous, so will be the sentence final conditional without *only*.

(13a) ?Mary used to smoke, if she stopped (13b) ?Mary used to smoke, only if she stopped

(13c) (?)Somebody killed Mary, if it was the butler (13d) (?)Somebody killed Mary, only if it was the butler

I will also discuss analogous problems in quantified sentences, like (11) or (12) and demonstrate that the present account can be straightforwardly extended to those cases.

(11) I like those books that my wife likes too (12) Yesterday, I met every student that you also met

Selected References: •[1]Beaver,D.(2001) •[2]Beaver,D.&Krahmer,E(2001) •[3]Chierchia,G.(2010) •[4]Chemla,E.(2009) •[5]Fox,D.(2008) •[6]George,B.(2008) •[7]Gazdar, G.(1979) •[8]Heim,I.(1983) •[9]Kripke,S.(2009) •[10]Schlenker,P.(2007) •[11]Schlenker,P.(2009) •[12]Chemla, E.& Schlenker,P.(2011) •[13]Rothschild,D.(2011) •[14]Soames,S.(1982) •[15]Soames,S.(2009) •[16]Stalnaker,R.(1978) •[17]Van der Sandt,R.&Geurts,B.(2001) •[18]Geurts,B.&Van der Sandt,R.(2004) •[19]Von Fintel, K.(1994) •[20]Von Fintel, K.(1998) •[21]Von Fintel, K.(2008) •[22]Beaver, D.&Geurts, B.(2011) •[23]Givón, T.(1982) •[24]Chierchia, G.,Fox,D.,Spector,B. (2008)