Truthmaking Even Ifs

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In this small note I would like to extend the semantics for indicative conditionals in Güngör n.d. to "even if" indicative conditionals. The measure of success for a formal semantics lies not only with its extensionally satisfactory predictions and how it leads to a satisfactory combination of inference rules, but also how this formal analysis extends to the closely related extensions of the original meaning of the linguistic entity at hand (in this case, from "if" to "even if"). Therefore, I believe it is important to test the limits of extendibility of the original analysis to other cases and it is my aim here to test the limits of the analysis in Güngör n.d. with a particular example.

"Even if" conditionals are sometimes called "scalar concessive conditionals" or "non-interference conditionals" (e.g. Yablo 2016, p. 180). I will not discuss in detail whether the effect of "even" on the meaning of "if" can be best explained via pragmatic or semantic tools, though I believe there is strong evidence that the effect must be explained by a semantic analysis (e.g. Vidal 2016).[1] I believe *a fortiori* that it is important (for reasons of uniformity and best explanation) for a formal semantic analysis to underlie "even if" conditionals within a common "if" semantics, while providing the necessary modification on the truth-conditions to accommodate "even if" conditionals as well. Keeping all this in mind, I will thus show below that the semantics in Güngör n.d. can be extended to "even if" conditionals by making a small addition to the truth conditions.

The truth-conditions for indicative conditionals in truthmaker semantics is given as follows (Güngör n.d., p. 18):

(TCI$^+$) $w \vDash \mathrm{P} \longrightarrow_c \mathrm{Q}$ iff $u \vDash \mathrm{Q}$ whenever $t \Vdash \mathrm{P}$, $c \sqcup t \in \mathcal{S}^\diamond$ and $t \rightarrow_{c,w} u$.

The basic idea is that every context-relevant (c) possible outcome (u) of the antecedent must verify the consequent.[2] Now we must supply these truth-conditions with the contribution of "even." First, let us discuss what "even if" statements intuitively say and how what they say is different from a bare "if" statement says and make an intuitive analysis with some examples. Take the following two:

(1) If he studied hard, he passed the exam.

(2) Even if he studied hard, he failed the exam.

Intuitively, (1) says that all of the contextually relevant possible outcomes of his studying are the ones where he succeeds. (1) does not say anything whether he would succeed in the scenario where he did not work hard. He might be a genius and simply would not need hard work or he might be a mediocre student who would succeed with the right amount of study. On the other hand, (2) says that no amount of work can make the relevant student go beyond the threshold of failure. So, the intuitive idea is that the consequent comes about in any possible outcome (the contribution of the "ìf" connective) and the antecedent will not prevent it from coming about, either (the contribution of "even"). In other words, the consequent holds in all

[1] A pragmatic analysis might go as follows: the semantic content of an "even if" conditional is just identical to the semantic content of its consequent. However, the assertion of the "even if" conditional carries the pragmatic effect of raising the possibility of the antecedent non-trivially bearing on the negation of the consequent *just in order to* shoot down that possibility. For instance, when I say "Even if our fate is death, we have to make our own choices," it seems that I imply one might think perhaps we may not make our own choices, if our choices lead to death; but that is not so. There are reasons to be unsatisfied with this analysis, though a full discussion would take us too far afield.

[2] For the complete explication of these notions, refer to Güngör n.d., §3

the possible outcomes, *but* all the possible outcomes are just the actual world (or any world of evaluation for the conditional for that mattter), because the antecedent brings about no change which bears on the possibility of the consequent and no change in the world of evaluation leads to the world of evaluation itself. How can we reflect this in (TCI$^+$)? One natural suggestion is to equate all the possible outcomes to the world of evaluation, since the semantic difference of "even if" conditionals from bare "if" conditionals lies in how antecedents lead to no change (as opposed to *possibly* some change) in the world of evaluation and, thus, possible outcomes of the antecedent must be identical to the world of evaluation. For a context-relative "even if" connective $\rightsquigarrow$, this idea yields:

(TCEI$^+$) $w \models \mathrm{P} \rightsquigarrow_c \mathrm{Q}$ iff $u \models \mathrm{Q}$ **and** $u = w$ whenever $t \Vdash \mathrm{P}$, $c \sqcup t \in \mathcal{S}^\diamond$ and $t \rightarrow_{c,w} u$.

Provided that (TCI$^+$) is extensionally adequate, I believe this extension provides an extensionally adequate semantics for "even if" statements. But how to tell? What do we have besides our assertion of adequacy? A good way to test a semantic theory for natural language is to test whether the semantics predicts the infelicities. So let's test how our proposal fares here. First, (TCEI$^+$) predicts that the consequent will be true in the world of evaluation (w). Therefore, any assertion of an "even if" conditional" with the assertion of the negation of the consequent must produce infelicities according to our analysis. For instance:

(3) He passed the exam, # but even if he studied hard, he failed the exam.

Our analysis predicts that a contradiction ensues in (3), because assuming the first assertion is true, i.e. $w \models$ "He passed the exam," then it must be the case that $w \not\models$ "He failed the exam," because if the conditional in (3) is true, then for all possible outcomes u, $u \models$ "He failed the exam" and, since $u = w$ from (TCEI$^+$), $w \models$ "He failed the exam." So, both $w \not\models$ "He failed the exam" and $w \models$ "He failed the exam," which is a contradiction. Therefore, (TCEI$^+$) predicts the infelicity by letting us derive a contradiction.

However, this prediction might be considered trivial, because bare "if" conditionals of the same sort also sound infelicitous:

(4) He passed the exam, # but if he studied hard, he failed the exam.

Supposedly successful assertion of his passing the exam voids any other possibility to the contrary and (4) becomes infelicitous. However, if we relax our discourse to the belief contexts, then we can cook up diverging examples for "if" and "even if" conditionals. Consider the following:

(5) I believe he failed the exam, but if he studied hard, he passed it.

As far as I see, there is no infelicity in this utterance, because it is only at the level of belief that he failed the exam, but the possibility of his studying hard and passing it is still open. In other words, he might be a lazy fellow, who is pretty unlikely to work hard. This prompts me to the belief that he failed. However, when he does work, it is certain he passes, which makes me also believe that he passed it on the condition that he worked hard. There is no incoherence between these two beliefs.[3] So, we have seen there is no infelicity ensuing in (5). However, take the "even if" analogue of this example:

(6) I believe he passed the exam, # but even if he studied hard, he failed it.

(6) sounds unacceptable to me, because it sounds tantamount to asserting that I believe he passed the exam and I believe that he failed it, which is a contradiction even at the level of belief. We can reflect this infelicity with (TCEI$^+$), but instead of working with world states, let

[3] Just as there is no infelicity in what Gillies calls "belief-contravening indicative conditionals" (Gillies 2004, p. 585). For instance, the following utterance is perfectly fine:

(a) I believe Oswald shot Kennedy, but if he didn't, someone else did.

us work with belief states. Let s be a belief state. Then we have as a supposition in (6), $s \vDash$ "He passed the exam." Now let us remember what (TCEI$^+$) says:

(BTCEI$^+$) $w \vDash \mathrm{P} \rightsquigarrow_c \mathrm{Q}$ iff $u \vDash \mathrm{Q}$ **and** $u = w$ whenever $t \Vdash \mathrm{P}$, $c \sqcup t \in \mathcal{S}^\diamond$ and $t \rightarrow_{c,w} u$.

What (TCEI$^+$) implies is $u \vDash \mathrm{Q}$ **and** $u = w$ and in particular for (6), $w \vDash$ "He failed the exam." Now what we have is a Moore-paradoxical conjunction "I believe that he passed the exam, but he failed it." This time we can apply the same argument above to obtain the contradiction for (6) at the level of belief, i.e. $s \vDash$ "He passed the exam" and $s \nvDash$ "He passed the exam," whereas leaving (5) felicitous, because the possible outcomes need not be identical to the belief states we started with. Therefore, our truth/acceptance-conditions in the form of (TCEI$^+$) and (BTCEI$^+$) correctly predict the felicity/infelicity of (5)/(6).

There are a lot of other things to say about this extension, but I believe this much is enough to illustrate that a simple modification of our original truth-conditions satisfactorily extend to "even if" conditionals as well. We did not re-write the semantics for this extension, satisfying our proviso given at the start of this note.

References

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