

## On negative antecedents in deontic-conditionals

**Introduction.** In setting up primary obligations, we often have a back-up plan in case of failure:

- (1) a. The baby should be in bed (when I get home). (-says the parent to the baby-sitter)  
b. If she is not in bed, she should be sitting quietly on the sofa. (-she adds)

Following [1], conditionals like (1b) are known as *Contrary-To-Duty Imperatives* (CTDs). The antecedent of a CTD singles out special circumstances in which a ‘secondary duty’ is actually the best option (e.g. *You should return the library book on time. If you return it late, you should pay a fine.*). Cases like (1b) are interesting because the negative *if*-clause does not single out circumstances that are different from those in which we would assert the primary duty: Imagine that the parent comes home and finds the baby playing in the kitchen. Would she tell the baby-sitter *The baby should be sitting quietly on the sofa*, instead of *The baby should be in bed*? The antecedent in (1b) does not single out circumstances in which (1a) is false (or infelicitous). Yet, (1b) functions as a back-up plan. This paper provides an analysis of *should* that explains (1b).

**Factual detachment.** The problem posed above could be characterized as a question about factual-detachment (the truth of *if A, should B* and *A* leads to the truth of *should B*) with negative *if*-clauses. [1] showed that within standard deontic logic, factual detachment was a valid inference pattern that lead to contradictions (*Chisholm’s Paradox*). [2] provided a situation-based account of deontic conditionals that validates factual detachment without giving rise to paradoxes. However, the case corresponding to negative *if*-clauses was not considered. Notice that we are not always willing to detach an unconditioned obligation when the negative antecedent of a CTD is true. The way in which the antecedent is made true (the circumstances) matters:

- (2) Parent: The baby is not in bed! She is playing on the kitchen floor!  
a. Baby-sitter: The bed burned down! Parent: She should be sitting on the sofa!  
b. B-s.: I didn’t realize it had gotten so late! Parent: #She should be sitting on the sofa.

Another ex.: *Miss Canada should be Canadian. If she is not Canadian, she should be French.*

- (3) Me: Miss Canada is Mexican! She should be Canadian!  
a. Judge: The Canadian contestants were disqualified. Me: She should be French  
b. Judge: We ignored the regulations. Me: #She should be French! (*plus other examples*)

Descriptive generalization: we are not willing to detach an unconditioned obligation from CTDs with negative *if*-clauses if the circumstances that make the antecedent true are causally related to the falsehood of the proposition embedded under the modal. This indicates that the semantics for *should* must be appropriately sensitive to what is going on in terms of causal relations.

**Should.** We analyze deontic *should* as a fact-sensitive modal, using Kratzer-style modal bases and ordering sources. For *should*  $\alpha$ , the modal base is  $f\text{-}\alpha$ : a totally realistic conversational background revised so as to be consistent with the embedded proposition  $\alpha$ . For all  $w \in W$ :

(4)  $f\text{-}\alpha(w)$  = the maximal set  $A \subseteq f_{\text{totally realistic}}(w)$  such that: (i)  $A$  is consistent, (ii)  $A$  is closed under lumping, logical consequence and causal relations (i.e.  $f\text{-}\alpha(w)$  includes the consequences of the laws of  $w$ ), (iii)  $\alpha \notin A$ , (iv)  $\{\alpha\} \cup A$  is consistent (Inspired by [3],  $f\text{-}\alpha(w)$  is a set including all propositions true in  $w$  compatible with  $\alpha$  and closed under lumping, logical consequence and causal relations. To simplify, we assume there is only one way of revising  $f_{\text{tot-real}}$ ). This modal base makes *should* sensitive to everything that is going on compatible with the embedded proposition. The ordering source corresponds to the contextual measure of goodness (to simplify, we assume that it is always possible to find the ‘best’ worlds):

(5) Given an ordering source  $g$ , possible worlds  $w, w'$ :  $w'$  is a  $g(w)$ -closest world iff there isn’t a world  $w''$  s.t.  $w'' <_{g(w)} w'$  (i.e. *iff there isn’t a  $g(w)$  closer world*).

Given (4) and (5), a statement of the form *should*  $\alpha$  will be given the truth-conditions in (6):

(6)  $[[\text{should } \alpha]]^{f-\alpha, g}$  is true in  $w$  iff  $\forall w' \in \cap f-\alpha(w)$ : if  $w'$  is a  $g(w)$ -closest world, then  $w' \in \alpha$ . The modal base will select all the propositions true in  $w$  suitably compatible with the embedded clause, and the ordering source will select the best worlds in which those propositions are true. The *should*-statement will be true iff the embedded proposition is true in the best worlds.

**Primary vs. secondary duties.** Given (6), primary and secondary duties are compatible (see [4]):

(7)  $[[\text{should (the baby is in bed)}]]^{f-\text{the baby is in bed}, g}$  is true in  $w$  iff

$\forall w' \in \cap f-\text{the baby is in bed}(w)$ : if  $w'$  is a  $g(w)$ -closest world, then  $w' \in$  'the baby is in bed'.

(8)  $[[\text{should (the baby is on the sofa)}]]^{f-\text{the baby is on the sofa}, g}$  is true in  $w$  iff

$\forall w' \in \cap f-\text{the baby is on sofa}(w)$ : if  $w'$  is a  $g(w)$ -closest world, then  $w' \in$  'the baby is on sofa'.

(7)/(8) are compatible because the modal bases differ, so different worlds may be quantified over. Semantics predicts that (7) and (8) can both be true. If so, a speaker can choose either claim.

**Predictions for negative *if*-clauses.** (6) can correctly differentiate the scenarios in (2a) and (2b):

(9) *Scenario (2a)*: The bed burned down and the baby-sitter let the baby play in the kitchen. The modal base  $f-\text{the baby is in bed}(w_{@})$  will exclude the proposition that the baby is in the kitchen and include the proposition that there is no bed (causally related to the proposition that the baby is not in bed). The best worlds will be worlds in which the baby is on the sofa: (8) is true.

(10) *Scenario (2b)*: The baby-sitter thought it was still early and let the baby play in the kitchen. The modal base  $f-\text{the baby is in bed}(w_{@})$  will exclude the proposition that the baby is in the kitchen and will also exclude the proposition that the baby sitter thought that it was early (causally responsible for the baby being in the kitchen). The best worlds in the modal base will be worlds in which the baby sitter did not think it was early and the baby is in bed: (8) is false.

(6) makes correct predictions for (2) because different propositions are excluded from  $f_{\text{totally realistic}}$  in each case. (6) allows circumstances to determine whether the secondary duty is actually true.

**Conditionals and factual detachment.** There are two different types of *should*-conditionals: (i) epistemically sensitive *should* conditionals, in which tense in the antecedent clause is interpreted deictically (or with future orientation), (11); (ii) epistemically insensitive *should* conditionals, with past morphology in the antecedent and a 'shifted' interpretation, (12) [we'll focus on (11)].

(11) If the baby is not in bed (when I get home), she should be on the sofa.

(12) If the baby were not in bed/ had not been in bed, she should be /have been on the sofa.

I propose that in the case of (11), the antecedent-clause is attached to a (silent) epistemic modal that embeds *should* in the consequent (see also [5]), whereas in (12) the antecedent clause is attached lower, in the scope of *should* (triggering past agreement morphology in the antecedent).

(11') modal<sub>epistemic</sub> (*if the baby is awake when I get home*) (should (the baby be on the sofa))

We can interpret (11') as stating that in all the worlds compatible with what is known in which the baby is awake, she should be on the sofa. If (11') is true and the baby actually is awake, the fact-sensitive semantics in (6) predicts that the unconditioned *should* statement will also be true. Factual detachment will be valid. [However, we may interpret epistemic modals with *an ordering source* that prefers the worlds that we consider most likely. If (11') is interpreted with such an ordering source, the actual truth of the antecedent will not guarantee the consequent. This will be the case if the antecedent is true but the actual world is unexpected/unlikely.]

**Conclusion.** The semantics of CTDs is an important part of understanding deontic modals and conditionals [6, 7]. By examining CTDs with negative *if*-clauses, we have provided evidence in favor of a fact-sensitive semantics for deontics that treats causal relations as information about the world that must be taken into account when evaluating deontic claims.

**References.** [1] Chisholm (1963), [2] Arregui (forthcoming SALT 18), [3] Kratzer (1989), [5] Frank (1997), [4] Prakken and Sergot (1996), [6] Åqvist (2002), [7] Carmó and Jones (2002)