Conversational backoff Kyle Rawlins (Johns Hopkins University)

The phenomenon   Two types of dynamic updates are well-established. Uncontroversial statements lead to monotonic updates: tractable and easy to model e.g. with ∩ (Stalnaker 1978 etc.). Disagreements, however, lead to non-monotonic updates: less tractable, and requiring belief revision to model. This paper describes and analyzes a case in the middle, neglected but for Lewis 1979. This is a species of non-monotonic update that is nonetheless perfectly tractable; I term it *conversational backoff*. It is exemplified in the following two dialogues.

(1)   A: Alfonso is going to lose.

      B: What if he plays at B2? (*What if* question)

(2)   A: Alfonso is going to lose.

      B: What about the move at B2? (*What about* question)

In both examples, A makes an assertion, and B challenges it in an indirect way. The interesting property is that A's claim is the expected non-monotonic revision does not happen – the challenges allow A's claim to stand. However, they do limit the scope of A's claim. For example, B's question in (1) accepts that Alfonso will lose if he doesn't play B2 (though A meant it unconditionally). The question is limited only to the specific case where he plays B2. The question in (2) has a similar effect; the specific case is calculated from a nominal phrase instead of an "if"-clause.

There are other means to force conversational backoff, including questions of various other types, and assertions explicitly introducing further possibilities (as in Lewis's 1979 example 6). But it is difficult to accomplish conversational backoff with outright disagreement:

(3)   A: Alfonso is going to lose.

      B: That's not true; he can play at B2 to win.

This response challenges A's claim as a whole in a very different way than the earlier B responses.

Two main questions arise: (i) What is the characterization and analysis of conversational backoff? (ii) What makes the two types of questions highlighted above especially suited to it? We might imagine, following e.g. Asher and Lascarides 2003, that discourse representations are annotated with a BACKOFF relation (along the lines of their CORRECTION relation), and that the above questions force the instantiation of this relation. What I show here is that the conditions for and behavior of conversational backoff follow from general principles about discourse, and that the two types of questions above are special not in they linguistically mark a particular discourse relation, but in that they involve a combination of semantic properties leading directly to the pragmatic conditions for conversational backoff. In particular, they act as conditional questions anaphoric to some previous question under discussion in the discourse.

Analysis   Following Lewis 1979, I propose that conversational backoff is the resolution of vagueness about what was in the common ground; this vagueness is resolved in a direction unexpected to the initial speaker (A in the above). That is, A makes a claim implicitly relativized to some construal of what is in the common ground. B makes a discourse move that forces public resolution of this vagueness in a different way, asking a question only relative to the gap between A and B's alternate precisifications of the common ground. In the end, A's claim stands relative to the initial implicit construal, but their implicit construal is no longer jointly taken to be exhaustive. This adjustment is forced (and accepted by A) in preference to rejecting A's claim entirely.

Let us represent the uncertainty about the common ground by parameterizing it with a speaker argument X (cf. Gunlogson 2001, 2008) and a world argument w, as in (4). (*cs* stands for "commitment set" in Gunlogson's sense). Each world corresponds to a way of making the common

ground precise. Relative to some *conversational domain* $D \subseteq W$ we obtain a set of commitment sets that represents the ways that the context could be. This construct is somewhat like Gunlogson's *reduction set*, but here instead of uncertainty about future discourse states we are modeling epistemic uncertainty about the present state. It is then easy to see how to reconstruct, given a conversational domain, a (speaker oriented) context set representing maximal certainty as in (5) , or a Stalnakerian joint commitment set a la Gunlogson ($cx_{\{S,H\},D}$). Assertion can then be defined as an operation that updates all versions of the alternative set, as in (6) (in the joint case, this reduces to standard dynamic update).

(4) Let $cs_{X,w} = \{p \in D_{\langle st \rangle} \mid X$ is publicly committed to p in $w\}$ (*commitment set*)

(5) Let $cx_{X,D} = \bigcap_{w \in D}(cs_{X,w})$ (*certainty context set*)

(6) $D + [\text{Assert}_X \, \phi] = \{w \mid \exists w' \in D : cs_{X,w} = (cs_{X,w'} \cup \{\llbracket \phi \rrbracket\})\}$

What can lead to conversational backoff? I illustrate the idea here by focusing on "what if" questions ("what about" questions work similarly, but their conditional nature is less direct). Said questions act like conditional questions (Isaacs and Rawlins 2008), except that the question is supplied anaphorically, instead of by a main-clause interrogative. That is, they effectively serve to "re-ask" an earlier question. Following Isaacs and Rawlins, I assume that a conditional question raises an issue only relative to a temporarily restricted context where the content of the "if"-clause is true. Crucially, the question has no impact outside of the restricted context. With conversational uncertainty, this temporary restriction and relativized questioning would be calculated relative to every possible construal of the context. (I assume but in this abstract do not represent the idea that Suppose leads to a temporarily restricted view of the context as in I&R, and that ϕ? partitions the context as in Groenendijk 1999.)

(7) Where ϕ? is the salient issue, $D + [\text{what if } \psi] = (D + \text{Suppose } \psi) + \phi$?

What does this add up to? A's assertion proposes to completely resolve some issue (e.g. whether Alfonso will win or lose). B's conditional question raises the issue again restricted only to a special case (e.g. if he plays at B2). I assume (following Beck and Kim 2006) that questioning cannot be trivial; it must involve multiple possible alternatives. But re-asking an answered question, even in a restricted way, would lead to triviality. Something must give; we could simply drop A's claim and start over, but (I propose) complete revision is a last resort. The formula in (7) leaves a substantial portion of the context untouched – it only requires ϕ? to be non-trivial in regions of the context where ψ is true. A's claim will therefore be compatible with the "what if" in exactly the untouched portions. Further, at the time of A's utterance, D was vague about whether ψ was a possibility.

The **conversational backoff adjustment** involves the speakers assuming that A's claim was interpreted relative to a precisification of the common ground where ψ is not a possibility. The result is then imported into the alternate precisification, where ψ is a possibility, but leaving the ψ-true regions untouched. This alternate precisification is forced by the contribution of the "if"-clause, which (following Stalnaker) requires that its contents be possible. The net effect is an ex post facto conditionalization of A's initial claim, in order to avoid dropping the claim altogether.

The crucial step is that in order to resolve the clash between the utterances without rejecting either one, the speakers jointly back off to the more inclusive resolution of what the context could be, but only after assuming a less inclusive version and interpreting A's utterance relative to it. Ingredients leading to backoff in (1-2) are uncertainty about the context, anaphoricity to a prior question (re-asking), and conditionalized questioning. These two constructions combine all these ingredients in one place, setting up the ideal situation for conversational backoff.