Alternative vs Polar questions: the cornering effect

The problem: The standard Hamblin/Karttunen semantics for Polar Questions (PolQ), (1a), and alternative questions composed of two polar alternatives (AltQ∨N), (1b), induces equivalent partitions: (1a-i) and (1b-i) (the canonical intonation is as indicated ([7, 5])).

(1) a. Are you making pasta$_{\text{L-H}^\%}$?  
   i. $[\text{PolQ}]$ [(final raising)] $\lambda q[q = \lambda w.make(pasta, you, w)]$
   b. Are you making pasta$_{\text{L-H}^\%}$ or not$_{\text{L-L}^\%}$?  
   i. $[\text{AltQ∨N}]$ [(final fall)] $\lambda q[q = (\lambda w.make(pasta, you, w) \lor \lambda w.make(pasta, you, w))]$

The denotations in (1a-i) and (1b-i) do not explain the differences pointed out by [2]: in requests, (2a), rhetorical questions, (2b), invitations, (2c), and conversation starters, (2d) it is only appropriate to use a PolQ (in those cases, using AltQ∨Ns, as in (2), is inappropriate).

(2) a. Will you marry me or not? (odd)  
    b. Are you crazy or not? (odd)  
    c. Do you want a beer or not? (odd)  
    d. Do you like to play golf or not? (odd)

[8] have recently provided a purely pragmatic account of PolQs vs. AltQ∨Ns according to which PolQs are special because their positive answer has a higher utility value for the questioner. However, there are problematic examples as well as new data that remains unexplained (3): the cornering effect.

(3) A: Are you making pasta$_{\text{L-H}^\%}$?  
    B: (Silence and dubitative faces)  
    A: Are you making pasta$_{\text{L-H}^\%}$ or not$_{\text{L-L}^\%}$?

The use of an AltQ∨N triggers the cornering of the addressee, (3), an effect not found if instead a PolQ is uttered again: see (4), where any effect is just the mere result of insistence.

Proposal overview: We derive the differences between AltQ∨N and PolQ with a semantics that characterizes both as involving lists of alternatives (spelled out or not): PolQs involve an open list (just one alternative is spelled out), indicated by its final raising intonation, whereas AltQ∨Ns involve closed lists (all alternatives spelled out), indicated by its final falling intonation ([10]) establishes a connection between intonation and open vs. closed lists for assertive disjunctions. Open and closed lists differ semantically with respect to the presence/absence of a Closure operator acting on the possible alternatives ([10]). We treat the information provided by the closure operator as a presupposition associated with closed-lists questions. This difference in the semantics makes a difference in the discourse. I use a hierarchical discourse model ([6], [3]) to illustrate these differences and ultimately explain the cornering effect. The claims are supported by the results of two processing experiments.

The semantics: In what follows I treat lists within Hamblin semantics ([1]): (i) the denotation of a simple proposition is the set containing the proposition; (ii) there is no or in the semantics ([10,4,1]) and disjunction only presents lists: sentences with or denote the union of the sets corresponding to the disjuncts ([1]). I slightly modify the standard question operators in Hamblin/Karttunen semantics to scope over sets of propositions via functional application.

(5) $[Q_{\text{yes/no}}] = \lambda S_{<,>,\tau,\tau,\tau} \lambda w.\lambda q. \forall r_n \in S[q = (r_1 \lor r_2 \ldots \lor r_n) \lor q = \neg(r_1 \lor r_2 \lor \ldots \lor r_n)]$

(6) $[Q_{\text{Alt}}] = \lambda S_{<,>,\tau,\tau,\tau} \lambda w.\lambda q. \forall r_n \in S = q = r_1 \lor r_2 \lor \ldots \lor r_n$

a. AltQ∨N: AltQ∨Ns are a special instance of questions with overt disjunction like Are you making pasta or fish? These questions have two possible intonational patterns, (7), with 2 readings [7, 5] (following [7] I assume ellipsis in the second disjunct (are you making fish).

(7) a. Are you making pasta$_{\text{L-H}^\%}$ or fish$_{\text{H-L}^\%}$?  
   (final fall) [Alternative reading]
b. Are you making pasta or fish? (final raise) [Yes/No reading]  
With raising intonation, (7b), the questioner doesn’t assume that making pasta or making fish are the only possible alternatives amongst which the addressee may choose, others may be (contextually) available. With final falling intonation, (7a), the questioner assumes that the only possible alternatives are either making pasta or making fish: the final fall indicates the presence of closure. I propose the operator in (8), (inspired by [10]’s) as a presupposition operator. Γ combines with a set of propositions and checks the epistemic closure of that set.  
(8) \[ \Gamma := \lambda G << s, t, t >> : (\forall x) (\forall P) [q = P(x) \& \text{EpistemicallyPossible}(q)] \rightarrow q \in G].G \]

Questions with disjunction of two polar (complementary) alternatives can only have final fall (closed list, Γ is present), (1b):  
(9) \[ J(1b)K = \lambda w.\lambda q. q = \text{make}(2\text{sg}, \text{pasta}) \lor \neg\text{make}(2\text{sg}, \text{pasta}) \]  
Presup.: the only epistemic alternatives are make(2sg,pasta) and ¬make(2sg,pasta)  

b. PolQ: Non-\textit{wh} questions without overt disjunction also have two possible intonations with 2 readings. The default/canonical intonation is as in (10) [PolQ], but (11) is also possible.  
(10) Are you making pasta? [PolQ]  
(11) Are you making pasta?  
With final raising intonation, (10), the questioner does not assume that the addressee can only make pasta: there may be other things that the addressee may want to do (the question is ultimately “what are you making? maybe pasta?”). However, with final fall, the only alternative considered by the questioner is making pasta, and s/he does not care about any other possibility: Γ is present in the semantics in (11), but not in (10), (12) (cf.(12) and (9)).  
(12) \[ J(10)K = \lambda w.\lambda q. q = \text{make}(2\text{sg}, \text{pasta}) \lor q = \neg\text{make}(2\text{sg}, \text{pasta}) \]  

\textbf{The Discourse:} Making use of a hierarchical discourse model ([6, 3]), we can make further predictions. PolQs (without Γ) have sisters (=discourse alternatives), (13), available to the addressee (A: Are you making pasta? B: I am making stew). AltQ\&Ns (with Γ) do not have sisters, (14): the questioner (and the addressee when accepting the move) (pretends to) accept (9) that no discourse alternatives other than those spelled out are available at the time of utterance. AltQ\&Ns can be used as substrategies to get an answer to PolQs, but no strategy can be used to get an answer for an AltQ\&N: AltQ\&Ns are a cul de sac, the last possible questioner’s move. \textbf{Consequences:} (i) PolQs can point to more general questions and are good conversation starters; (ii) AltQ\&Ns are the last questioner’s move and do not leave the addressee space to maneuver: they are the preferred question to close previously opened issues (bad conversation starters). The cornering effect is the result of Γ in AltQ\&Ns and its discourse impact (it makes them the last move). Experimental results support (i) and (ii), and disconfirm the predictions in [8]. The differences also explain [2]’s data in (2).

\textbf{Conclusion:} The closure of alternatives marked by intonation ([10]) has consequences for the semantics of questions. We have shown that such differences in the semantics shape discourse structure and account for pragmatic effects.