

# Decomposing cornering effects: an experimental study<sup>1</sup>

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**Abstract.** Alternative Questions with “or not” (NAQ) convey a *cornering effect*, which is not found with their polar counterparts (PQ). This effect has been claimed to consist of two parts (Biezma 2009): NAQs (i) cannot be used discourse-initially and (ii) they do not license follow-up questions/subquestions. In this paper, we ask the following: Are both parts of cornering linked to the same property of NAQs? Or do they reflect distinct linguistic phenomena? We explore the issue by comparing the behavior of NAQs to Complement Alternative Questions (CAQ), a type of question that, like NAQs, presents logically opposite alternatives but, unlike NAQs, fully spells out the second one. Results from two experiments suggest that both parts of cornering can instead be explained in terms of independent semantic and pragmatic principles, which operate beyond the domain of alternative questions.

**Keywords:** Alternative Questions, cornering, discourse, focus, information structure.

## 1. Introduction: the Cornering Effect

Questions with seemingly similar semantic content have significantly different pragmatic properties. In particular, Bolinger (1978) observed that Polar Questions (henceforth, PQs) tend to have a broader distribution than Negative Alternative Questions, that is, their alternative counterparts with “or not” (henceforth, NAQs). For example, PQs have been reported to be more felicitous than NAQs in many non-canonical uses—e.g., when used to make invites, draw inferences, or pose rhetorical questions. In addition, Biezma (2009) observes that, in information-seeking uses, NAQs induce a *cornering effect*, whereby they put the discourse in a ‘cul de sac’ (Biezma 2009), pressing the hearer to provide an answer. According to Biezma, the cornering effect can be broken down into two distributional restrictions. First, NAQs are inappropriate discourse-initially, as shown in the following example.

### (1) **Cornering, Part 1**

**Scenario:** You are in charge of coordinating the cooks for the colloquium dinner. John is one of the cooks. Dinner is tomorrow and you need to know what is happening with the pasta.

**You:** # Are you making pasta or not?

NAQ

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Second, NAQs are necessarily discourse-final, that is, they do not license followup questions/subquestions.

(2) **Cornering, Part 2**

**Scenario:** You are in charge of coordinating the cooks for the colloquium dinner. John is one of the cooks. Dinner is tomorrow and you need to know what is happening with the pasta.

**You:** Are you making pasta?

**John:** (Silence and dubitative faces)

**You:** ✓ Are you making pasta or not?

NAQ

**John:** (Silence and dubitative faces)

**You:** # Are you making pasta?

It follows from these restrictions that NAQs are only felicitous in a context in which a question has already been asked before, and no other question follows it. Note that in this exchange a PQ is used discourse initially, and is followed by another question; this shows that neither component of cornering applies to it. In this paper, we address two interrelated questions: What is the underlying source of each part of the cornering effect? And are the two components of cornering independent from one another? Relying on two experiments, we aim to tease apart the following two possibilities in particular. One possibility is that cornering is driven by certain distinctive properties of NAQs, as suggested by two separate accounts in the literature; the other possibility is that cornering is driven by more general pragmatic principles underlying information structure and discourse, which apply beyond NAQs. To cast light on the issue, we will compare the behavior of PQs and NAQs to Complement Alternative Questions (henceforth, **CAQs**), a variety of question that poses two logically opposite alternatives, but spells out the second disjunct with a complementary antonym, as opposed to via negation.

- (3) a. Is it a boy or a girl?  
 b. Is it heads or tails?

Based on the results from our studies, we will suggest that Part 1 of cornering is linked to a particular focus structure which penalizes discourse-initial uses of questions in general; and that Part 2 is driven by a broader pragmatic principle that penalizes reusing a question that didn't previously work. The emerging picture is one in which each part of cornering is derived independently, and can be derived through constraints that apply beyond the narrow domain of NAQ.

The paper is organized as follows. In Section 2 we review two current accounts of the two components of the cornering effects: Biezma's (2009) exhaustivity/exclusivity-based analysis and Biezma and Rawlins (2014, 2018)' bundling-based analysis. In Section 3 we outline a third possibility to account for cornering. In Section 4 we introduce CAQs as a case study and outline our hypotheses. In Section 5 and 6 we describe the two experiments. In Section 7 we provide a general discussion of the findings from the study. In Section 7 we conclude.

## 2. Cornering and NAQs: hypothesis

### 2.1. Biezma 2009

Biezma (2009) argues that both parts of cornering track a semantic difference between the denotation of NAQs and PQs. Specifically, she argues that PQs denote an open list of alternatives, which contains  $p$  and other unmentioned alternatives salient in discourse; alternative questions at large, by contrast, denote two exhaustive, mutually exclusive alternatives  $\{p, q\}$ . What makes NAQs special, among alternative questions, is that they present *logically opposite* alternatives, that is  $\{p, \neg p\}$ . By virtue of this semantic property, NAQs necessarily exhaust the possibility space in discourse, presenting the hearer with no option other than picking one of the two proposed alternatives. These properties have two consequences for the distribution of these questions. On the one hand, they are an overly strong strategy to begin a conversation, explaining their infelicity in discourse-initial position. On the other hand, they can only be resolved with an answer, ruling out follow up questions or other inquisitive strategies. This explains their necessarily discourse-final position. By contrast, PQs, by virtue of denoting an open list, do not corner the addressee. Since they leave open plenty of options other than the mentioned one, they are adequate to start a conversation and they can be followed by further questions.

### 2.2. Biezma and Rawlins 2014, 2018

In subsequent work, Biezma and Rawlins (Biezma and Rawlins 2014, 2018) integrate Biezma's (2009) analysis of cornering by introducing the notion of *bundling*. In the authors' account, bundling refers to the particular strategy that a speaker adopts for "packaging" the available alternatives when asking a question. For example, in the following exchange, the speaker changes their inquisitive strategy turning a WH-Question into a PQ, bundling an open set of alternatives—i.e., "places for lunch"—into the category of "vegetarian places".

- |     |                                                 |      |
|-----|-------------------------------------------------|------|
| (4) | Question 1: Where should we go for lunch?       | Wh-Q |
|     | ...                                             |      |
|     | Question 2: Should we go to a vegetarian place? | PQ   |

The authors, specifically, argue that every bundling choice made by a speaker is subject to a *Qualitative Constraint*: there must be some reason to group alternatives together as a strategy in a particular way, distinct from prior discourse. Combined with NAQs' semantic properties, such a constraint is precisely what explains the two components of cornering. Let us consider the following example again.

- (5) **Scenario:** You are in charge of coordinating the cooks for the colloquium dinner. John is one of the cooks. Dinner is tomorrow and you need to know what is happening with the pasta.  
**You:** Are you making pasta?

**John:** (Silence and dubitative faces)

**You:** ✓Are you making pasta or not?

Here, following the initial PQ, the use of a NAQ re-organizes the logical space around  $p$ , bundling any alternative to it under  $\neg p$ . Per the Quality Constraint, the only possible reason to re-organize the logical space of discourse in this way is the following:  $p$  must already be the prominent alternative in discourse. This requirement derives the two components of cornering. Concerning the ban in discourse-initial position, for  $p$  to be already prominent in discourse it must be the case that the interlocutors have accepted a bias for  $p$ —that is, that ? $p$  has been asked before. Crucially, this constraint is not met in discourse-initial questions, explaining Part 1 of cornering. Concerning Part 2 of cornering, NAQs cannot be subject to further bundling; that is, no bundling strategy that is more informative is available to the speaker once a NAQ has been asked, making any further inquisitive strategy irrelevant. This explains NAQs' necessarily discourse-final status.

Note that, on this account as well, PQs are correctly not predicted to give rise to cornering. Since their denotation includes further, unmentioned propositions beyond the mentioned one, the use of this strategy does not induce a situation in which the entire logical space is organized around  $p$ . Because of this, PQs do not presuppose that  $p$  is already prominent in discourse, avoiding part 1 of cornering; and they can be followed by more informative bundling strategies, such as NAQs indeed, avoiding part 2.

The emerging picture is one in which the cornering effect can be explained via two alternative accounts: one based on exhaustivity/exclusivity, as per Biezma (2009); and one based on a combination of exhaustivity/exclusivity and bundling, as per Biezma and Rawlins (2014, 2018). Since they aim at explaining the same data, however, these proposals cannot be teased apart by merely looking at the behavior of NAQs in comparison to PQs. In the remainder of the paper, we thus aim to assess them by looking at Complement Alternative Questions, a type of question that, as we turn to explain shortly, presents itself as a suitable case study to compare the suitability of these two accounts. Before proceeding any further, however, we want to introduce a third possibility: Both Part 1 and Part 2 of cornering might be related to independent semantic/pragmatic principles, which apply besides the domain of NAQs, and just happen to coalesce in this particular construction. We now turn to discuss this hypothesis in greater detail.

### 2.3. A third hypothesis: Cornering as an effect of independent principles

Both accounts suggest that both Part 1 and Part 2 of cornering are linked to the same underlying phenomenon; that is, in both views, the two restrictions on the distribution of NAQs are seen as grounded in the properties that distinguish this type of inquisitive strategy from other ones. We suggest that, at least in principle, an alternative hypothesis ought to be entertained: each part of cornering could be the result of independent pragmatic principles, and thus explained independently from the other. In particular, we suggest that Part 1 could be grounded in the interaction between focus and information structure. Specifically, we observe that infelicity in

discourse-initial position is not found only with NAQs, but, more generally, with questions with focus on the polarity. The contrast below shows this for PQs with the focus on the auxiliary, as opposed to on the property (? , Lohnstein 2012).<sup>2</sup>

- (6) **Speaker A:** Jane had a baby!  
 a. **Speaker B:** Is it a BOY<sub>F</sub>? Focus on the property  
 b. **Speaker B:** #IS<sub>F</sub> it a boy? Focus on the polarity

Crucially, NAQs precisely present two opposite polar values as disjuncts. As such, following the generalization that all alternative questions mandatorily place main focal stress on the disjuncts (Bartels 1999, Truckenbrodt 2013), they necessarily have focus on the polarity, similar to (6b) above.

- (7) **Speaker A:** Jane had a baby!  
**Speaker B:** Is it a boy (yes<sub>F</sub>) or not<sub>F</sub>? Focus on the polarity

As such, concerning Part 1 of cornering, the additional hypothesis that should be considered besides those outlined above is the following: to the extent that focus on the polarity blocks the use of an interrogative clause at the beginning of a conversation, this factor could stand behind NAQs' infelicitous in discourse-initial position.

Similarly, Part 2 of cornering—that is, the necessarily discourse-final status of NAQs—could also be explained via an independent principle. Let us consider the crucial piece of data again.

- (8) **Cornering, Part 2**  
**Scenario:** You are in charge of coordinating the cooks for the colloquium dinner. John is one of the cooks. Dinner is tomorrow and you need to know what is happening with the pasta.  
**You:** Are you making pasta?  
**John:** (Silence and dubitative faces)  
**You:** ✓ Are you making pasta or not?  
**John:** (Silence and dubitative faces)  
**You:** # Are you making pasta?

Our hypothesis is that the infelicitous status of the final PQ might be driven not by the preceding NAQ, but by the fact that a PQ had already been asked with no success beforehand. Specifically, following a standard view of discourse moves as strategic attempts to solve a salient Question

<sup>2</sup>Focus accent on a tense verb may express, among other things, focus-marking on the polarity as in (i), verum focus as in (ii) (Höhle 1992) or so-called 'dictum' focus as in (iii) (Creswell 2000). Since (6b) with focal stress on the tense verb is infelicitous in the given context, none of these three uses is licensed discourse-initially. In this paper, the polarity focus use will be most relevant.

- (i) John arrived. Bertha DIDn't.  
 (ii) A: Rumor has it that Alan finished his dissertation.  
 B: HE Finished his dissertation.  
 (iii) A: Are we going to the party?  
 B: Right! ARE we going?

Under Discussion (Roberts 2012 among others), we suggest that speakers should not resort to strategies that already proved unsuccessful to solving the QUD in the previous turns. Doing so would result in pragmatically irrational behavior, since it would amount to adopting a strategy that, in light of what happened in the previous stages of the conversation, is very likely to fail. We summarize this idea in the *\*Repeat* principle, a conversational constraint that applies to discourse moves across the board. On this view, Part 2 of cornering would be orthogonal to the properties of NAQs, resulting instead from this more general principle.

(9) **\*Repeat:** Do not resort to a discourse move that already proved unsuccessful

#### 2.4. Interim summary

In this section, we have entertained three different hypothesis concerning the source of the two parts of the Cornering Effect: two of them are drawn from the previous literature; the third one has been formulated as part of the current investigation.

- **Hypothesis 1:** Both parts of cornering derive from logical exhaustivity/exclusivity (Biezma 2009);
- **Hypothesis 2:** Both parts of cornering derive from bundling around  $p$  plus logical exhaustivity/exclusivity (Biezma and Rawlins 2014, 2018);
- **Hypothesis 3:** Each part of cornering derives from an independent pragmatic principle (additional hypothesis)

### 3. CAQs: a testbed to test the hypothesis

We suggest that a viable case study to adjudicate these possibilities is represented by Complement Alternative Questions (CAQ), a type of alternative question that, similarly to NAQs, pronounces two logically opposite alternatives; but, contrary to NAQs, spells out the second alternative in full, as opposed to with "or not". (10) reports two examples.

- (10) a. Is it a boy or a girl?  
 b. Is it heads or tails?

Crucially, each of the hypotheses outlined above makes different predictions concerning the behavior of CAQs with respect to the two components of the Cornering Effect.

If, as Hypothesis 1 suggests, cornering is linked to the fact that the disjuncts exhaust the epistemic space of in discourse, CAQs should also feature both parts of the effect, since they likewise pose logically opposite alternatives. On this view, we predict that CAQs should behave exactly like NAQs with respect to both restrictions outlined above.

If, as Hypothesis 2 suggests, cornering is driven by the strategy to bundle the alternatives around

$p$ , then CAQs should feature neither part of the effects. Since they spell out the second disjunct with a full proposition, they do not presuppose that the speakers already accepted a bias for  $p$  in discourse; and they can be followed by more informative bundling strategies in the continuation of the conversation. On this view, we predict that CAQs should diverge from NAQs with respect to both restrictions.

Finally, concerning Hypothesis 3, we predict that CAQs and NAQs should behave differently from NAQs with respect to Part 1, and that neither CAQs nor NAQs should be necessarily discourse-final, as long as the question that follows them has not been used yet in the previous discourse. Let us unpack both predictions made by this account before proceeding any further. Concerning Part 1, this hypothesis suggests that the ban of NAQs in discourse-initial position is linked to that fact that they necessarily have focus on the polarity, a constraint that typically makes interrogative clauses infelicitous in the beginning of a conversation. But CAQs, contrary to NAQs, spell out two fully distinct propositions, as opposed to a proposition and its negated counterpart. As such, following the generalizations that all alternative questions necessarily have focus on the disjuncts, they have focus on such two propositions, and not on polarity, as illustrated below. If focus on the polarity is what determines Part 1 of cornering, it follows that NAQs should not be felicitous discourse-initial, while CAQs should be immune to this restriction.

- |      |    |                                                       |                       |
|------|----|-------------------------------------------------------|-----------------------|
| (11) | a. | Is it a boy <sub>F</sub> or a girl <sub>F</sub> ?     | Focus on the property |
|      | b. | Is it a boy (yes <sub>F</sub> ) or not <sub>F</sub> ? | Focus on the polarity |

Concerning Part 2, Hypothesis 3 suggests that the infelicity of PQs as a follow up to a NAQs is not due to the preceding NAQ per se; rather, it stems from the infelicity of repeating the PQ again, after it had been used in the beginning of the exchange. On this view, we expect that, *independently* of what we see for Part 1, both NAQs and CAQs should fail to license a follow-up question that was previously unsuccessful; and they should both be able to be followed by follow-up questions that hadn't been used yet.

We now turn to test these hypotheses in two experiments. Experiment 1 compares these three hypotheses with respect to Part 1 of cornering; Experiment 2 is concerned with comparing these possibilities with respect to Part 2.

#### 4. Experiment 1: CAQs and NAQs in discourse-initial position

In this study, we compared the distribution of NAQs, CAQs and PQs in discourse-initial position. Our goal is to assess the predictions of our three hypothesis concerning the source of Part 1 of the Cornering Effect, that is, the infelicitous status of NAQs at the beginning of a conversation. As can be recalled, the three possibilities outlined above make the following prediction with respect to this restriction: Hypothesis 1 predicts that both NAQs and CAQs, by virtue of exhausting the possibility space, should be infelicitous discourse-initially; Hypothesis 2 and 3 predict that only NAQs should be infelicitous in this context, while CAQs should sound natural.

## 4.1. Methods

### 4.1.1. Design

Two factors were crossed in a 2x3 design. Each trial consisted of a dialogue, at the end of which one participant would ask a question. The first factor manipulated the moment of the dialogue in which the question is asked, with two levels: ask for the first time, in which the question is asked discourse-initially; and ask-again, in which the question is asked for the third time, after the first two attempts failed to elicit a response. The second factor manipulated the type of question and came in three levels: PQ, NAQ, and CAQ.

(12) a. **Ask first-time**

Context: Mary runs into Greg on the street. It's been one year since they last saw each other, so they want to catch up:

Greg: Hey, what's new?

Mary: I just got a puppy!

Greg:

Oh, is it a male? PQ

Oh, is it a male or not? NAQ

Oh, is it a male or a female? CAQ

b. **Ask-again**

Context: Mark checks in at a hotel. After the receptionist hands him the keys, the following exchange ensues:

Receptionist: Sir, would you like to have breakfast directly served in your room?

Mark: Is there a charge for it?

Receptionist: It's a great service. Our customers love it.

Mark: Ok, but is there a charge for it?

Receptionist: You can also order food from the special menu.

Mark:

Is there a charge for it? PQ

Is there a charge for it or not? NAQ

Is there a charge for it or is it free? CAQ

### 4.1.2. Procedure and Statistical analysis

Each subject saw 24 experimental items, 12 for the ask-first-time context and 12 for the ask-again context, plus 24 fillers. The conditions were crossed in a Latin Square Design. 48 participants were recruited on Mechanical Turk and paid \$1.50 for participation. 2 participants were excluded as they failed to complete the task. At the end of each trial, participants were asked to answer the following question with a value between 1 and 7: "How natural does the question sound in light of the goal of the speaker? "1" indicated a completely unnatural



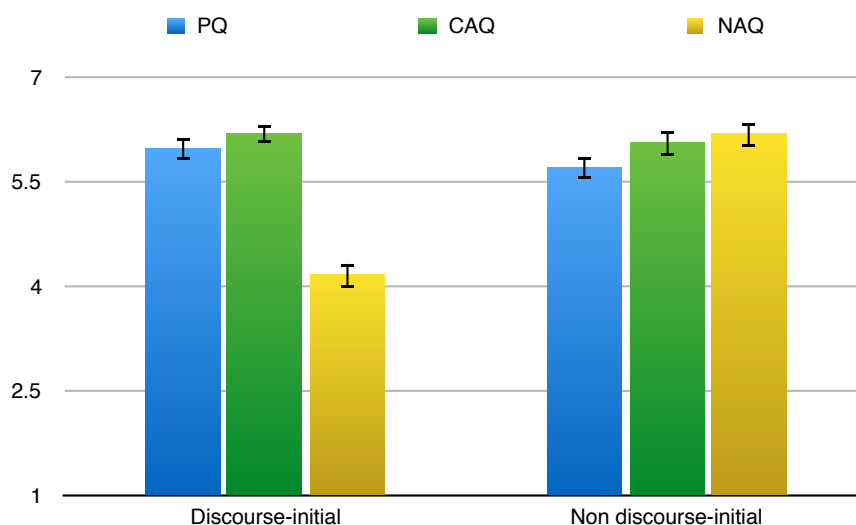


Figure 1: Average naturalness ratings for Experiment 2.

question; “7” indicated a perfectly natural question. All items were presented in written form on a screen. As in the first experiment, we ran separate mixed-effects models on the ratings of questions asked for the first time and asked again, with Question Type as the fixed effect and random intercepts for Subjects and Items. Again, the models were ran with the *lmerTest* package. Given the theoretical motivation of the study, we are especially interested in the comparison between NAQ and CAQ for each moment of the dialogue in which the question was asked. In light of this, we opted to establish NAQs as the reference level.

#### 4.2. Results

The results are plotted in Figure 1 below.

As predicted, the control condition turned out to be highly infelicitous across the board. We therefore removed it from the analysis. Remarkably, CAQs and NAQs patterned differently across these two contexts. When the question was asked for the first time, CAQs were rated higher than NAQs ( $\beta=2.01$ ,  $SE=0.28$ ,  $p<.0001$ ); when the question was asked again, instead, no difference emerged between NAQs and CAQs ( $\beta=-.18$ ,  $SE=0.14$ ,  $p=.2$ ). Concerning the contrast between PQs and NAQs, we observe that PQs were significantly better than NAQs when the question was asked for the first time ( $\beta=1.78$ ,  $SE=0.32$ ,  $p<.0001$ ); by contrast, NAQs were better than PQs when the question was being asked again ( $\beta=.48$ ,  $SE=0.17$ ,  $p<.01$ ).

#### 4.3. Discussion

In Experiment 1, we compared the distribution PQs, NAQs and CAQs discourse-initially. Replicating Biezma’s observations, NAQs appear to be felicitous only when used to ask a question again, while they are infelicitous discourse-initially. By contrast, CAQs show remarkable

flexibility across discourse-initial and non-discourse-initial uses, featuring equal naturalness in both contexts. Crucially, these findings do not support the predictions of Hypothesis 1—that is, that CAQs, by virtue of posing logically opposite alternatives, should also induce cornering. However, the questions remain open as to whether the observed restrictions on NAQs are tied to their distinctive bundling effects, as per Hypothesis 2; or by the combined effect of information structure in interrogative clauses and the \*Repeat pragmatic principle, as per Hypothesis 3. To tease apart these two possibilities, we now proceed to compare NAQs and CAQs in discourse-final contexts.

## 5. Experiment 2

Hypothesis 2 predicted that NAQs, by bundling all discourse options around *p* or the negation thereof, should feature both parts of cornering, and thus have necessarily discourse-final status; CAQs, by adopting a completely different bundling strategy, should feature neither part of cornering, and thus be able to license follow up moves. By contrast, Hypothesis 3 predicted that the seemingly necessary discourse-final status of NAQs is an epiphenomenon of a pragmatic constraint penalizing repeated uses of a discourse strategy that didn't work. As such, NAQs and CAQs should pattern together with respect to Part 2 of cornering: both should be able to license follow up questions when the subsequent move has not been used before; but neither should be able to license follow up questions when the subsequent move has already been used in previous discourse. Experiment 2 aims to cast light on these two alternative possibilities.

### 5.1. Methods

#### 5.1.1. Design

Two factors were crossed in a 2x2 design. Each trial consisted of a dialogue in which one of the speakers would ask three questions, the first of which was always Polar Question. Factor 1 manipulated the type of second question, with NAQ and CAQ as levels; Factor 2 manipulated the type of the third question, with two levels: a question identical to the first PQ (i.e., “match”, abbreviated “M”); and a question different from the first PQ (i.e., “non-match”, abbreviated “NM”). Specifically, we ran two different sub-experiments, which were identical, except for the way in which the non-matching question was constructed. In Expt2A the non-matching question was a PQ asked with emphatic tone (i.e., all caps); in Expt 2B the non-matching question was a Wh-Question. The item below illustrates the whole paradigm across the two sub-experiments. Moreover, in each sub-experiment we had a control sequence with a Wh-Question as the first question, a PQ as the second, and a NAQ as the third question. This sequence was predicted to be felicitous (see Biezma 2009).

#### (13) Expt2A

**Herb and Kelly are about to play chess. There are only two possible colors: black or white.** Herb: “I’m so excited!”

Kelly: “Do you want black?”

Herb: “Well, I can’t wait to play”

**Q1: PQ**

- Kelly: “Ok, but do you want black {or not? / or white?}                    **Q2: {NAQ/CAQ}**  
Henry: “I want to win!”  
Kelly: “{Do you want black?/DO YOU WANT BLACK?}”                    **Q3: {M/NM}**
- (14)    **Expt2A**  
**Herb and Kelly are about to play chess. There are only two possible colors: black or white.** Herb: “I’m so excited!”  
Kelly: “Do you want black?”                    **Q1: PQ**  
Herb: “Well, il can’t wait to play”  
Kelly: “Ok, but do you want black {or not? / or white?}                    **Q2: {NAQ/CAQ}**  
Henry: “I want to win!”  
Kelly: “{Do you want black?/What color do you want?}”                    **Q3: {M/NM}**
- (15)    **Control: same across Expt 2A and 2B**  
**Herb and Kelly are about to play chess. There are only two possible colors: black or white.** Herb: “I’m so excited!”  
Kelly: “What color do you want?”                    **Q1: WhQ**  
Herb: “Well, il can’t wait to play”  
Kelly: “Ok, but do you want black?”                    **Q2: {PQ}**  
Henry: “I want to win!”  
Kelly: “Do you want black or not?”                    **Q3: {NAQ}**

### 5.1.2. Procedure and Statistical analysis

Each subject saw 12 experimental items, 3 for each condition, plus 10 control items. The conditions were crossed in a Latin Square Design. 48 native speakers of English were recruited in each sub-experiment via Mechanical Turk and paid \$1.50 for participation. At the end of each trial, participants were asked to answer the following question with a value between 1 and 7: ”How natural does the last question of the conversation sound in light of the goal of the speaker? “1” indicated a completely unnatural question; “7” indicated a perfectly natural question. All items were presented in written form on a screen. As in the first experiment, we ran separate mixed-effects models on the ratings of questions, with Q2 type and Match as the main effects, and random slopes for Subjects and Items. Again, the models were ran with the *lmer*test package. To better understand the effects, we then followed up with posthoc comparisons, performing t-tests with a Bonferroni correction for multiple comparisons.

### 5.2. Results

The results for Expt2A and Expt2B are plotted in Figure 2 and 3 below.

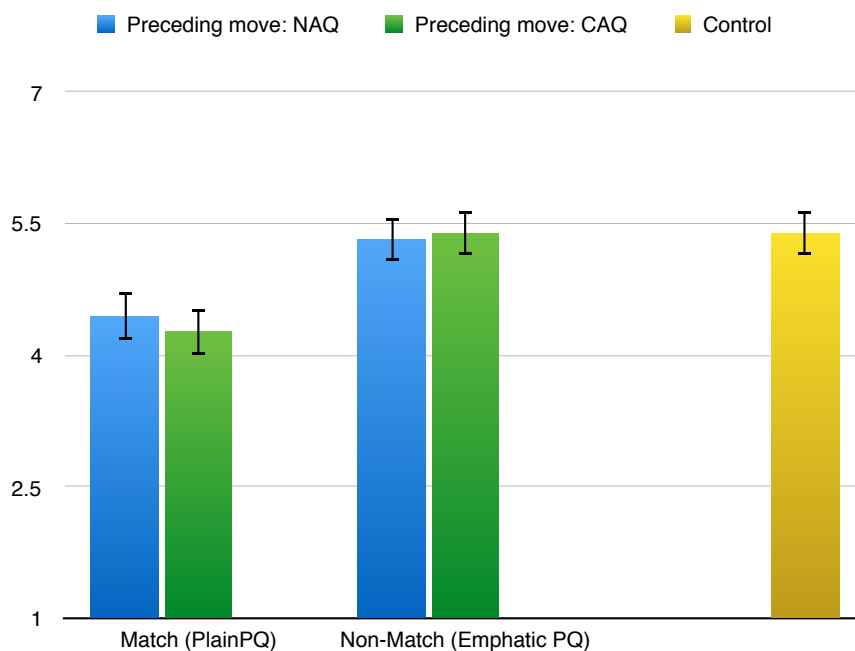


Figure 2: Average naturalness ratings for Experiment 2A.

As predicted, the control condition turned out to be felicitous in both studies, and was therefore removed from the analysis. Concerning the test conditions, we entered NAQs and Match as reference levels. The models showed a main effect of Match in both experiments (Expt 2A, Match:  $\beta=.90$ ,  $SE= 0.23$ ,  $p <.001$ ; Expt 2B, Match:  $\beta=1.20$ ,  $SE= 0.13$ ,  $p <.001$ ); no effect of Q2 Type in either experiment (Expt 2A, Q2 Type:  $\beta=-.15$ ,  $SE= 0.09$ ,  $p =.09$ ; Expt 2B, Q2 Type:  $\beta=-.12$ ,  $SE= 0.16$ ,  $p =.33$ ), and no interaction effect between Q2 Type and Match (Expt 2A, Q2 Type\*Match:  $\beta=.22$ ,  $SE= 0.13$ ,  $p=.09$ ; Expt 2B, Q2 Type\*Match:  $\beta=-.30$ ,  $SE= 0.12$ ,  $p =.12$ ). In particular, within each type of Q2, the last question was rated as more felicitous when it did not match the PQ asked in the beginning of the conversation than when it did (Expt 2A, Q2-NAQ:  $p <.001$ ; Expt 2A, Q2-CAQ:  $p <.001$ ; Expt 2B, Q2-NAQ:  $p <.01$ ; Expt 2B, Q2-CAQ:  $p <.001$ ). In addition, in both experiments, no difference between CAQ and NAQ was found within Match. (Expt 2A, Match:  $p >.5$ ; Expt 2A, Non-Match:  $p >.5$ ; Expt 2B, Match:  $p >.5$ ; Expt 2B, Non-Match:  $p >.5$ ).

### 5.3. Discussion

These findings suggest that what determines the status of the final question in a conversation is not whether the preceding move is a NAQ or a CAQ, but rather whether the same question had been asked before. We take this results as evidence supporting Hypothesis 3: the observed necessarily discourse-final status of NAQs is not driven by their features per se, but rather by the fact that follow-up PQs are not felicitous when they had already been used and did not accomplish the intended goal. If the follow-up question differs from the first question, either in terms of syntactic structure or intonation, neither NAQs nor CAQs need to be discourse final. The emerging picture is one in which also Part 2 of Cornering can be explained by appealing to general pragmatic principles that apply beyond the domain of alternative questions.

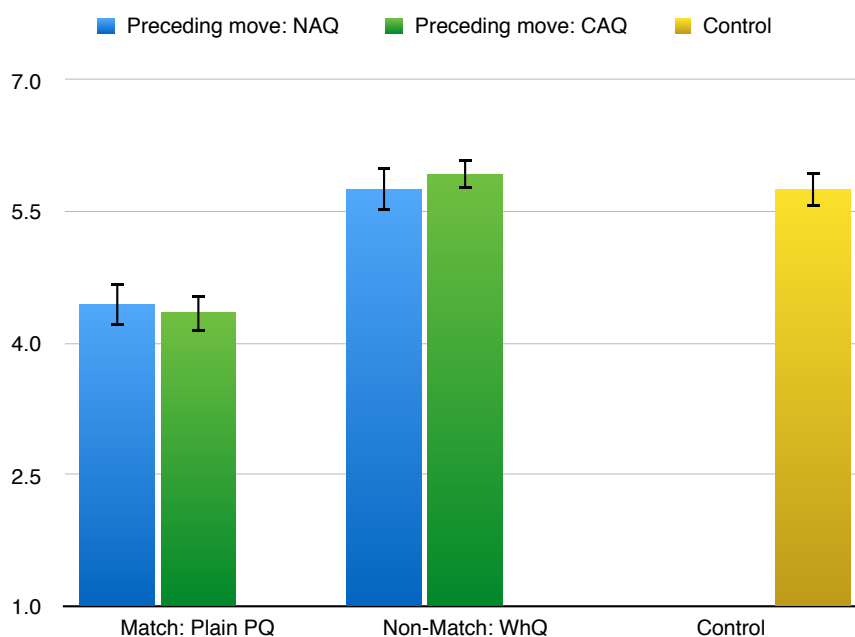


Figure 3: Average naturalness ratings for Experiment 2B.

## 6. General Discussion

We now turn to discuss in greater detail how these principles can be modeled for both components of the effect.

### 6.1. Explaining Part 1: Information Structure and Focus

We showed that NAQs' ban in discourse-initial position is not featured by CAQs, ruling out the possibility that this restriction be featured by the logical exhaustivity/exclusivity of the alternatives. Furthermore, based on the results of Experiment 2, we suggested that this restriction is likely not driven by bundling either; since bundling does not make the right predictions concerning Part 2 of cornering, requiring an independent explanation for it, it might be more appropriate to also explain Part 1 independently. In this regard, we observed earlier that NAQs are not the only type of question that is infelicitous discourse-initially; more generally, this restriction applies to all questions that have focus on the polarity (in (16)), whereas it doesn't apply to questions that have focus on the property, including CAQs (in (17)).

- (16) **Speaker A:** Jane had a baby!  
 a. **Speaker B:** #IS<sub>F</sub> it a boy? Focus on the polarity  
 b. **Speaker B:** Is it a boy (yes<sub>F</sub>) or not<sub>F</sub>? Focus on the polarity
- (17) **Speaker A:** Jane had a baby!  
 a. **Speaker B:** Is it a BOY<sub>F</sub>? Focus on the property  
 b. **Speaker B:** Is it a boy<sub>F</sub> or a girl<sub>F</sub>? Focus on the property

As for the reason that underlies this restriction, we follow Schwarzschild (1999) in proposing that to license narrow focus on BOY in (17) above, the proposition that there exists a property such that the baby has this property has to be given. To license narrow focus on the polarity, as in (16), the following proposition needs to be given: there is a polarity function (ranging over  $\{\lambda p.p, \lambda p.\neg p\}$ ) that, applied to the proposition “that the baby is a boy”, yields a true proposition. The two propositions are reported below:

- (18) a.  $\exists X_{\langle e, st \rangle}[\text{the baby is } X \text{ at } w]$   
 b.  $\lambda w. \exists X_{\langle st, st \rangle}[X(\lambda w'. \text{the baby is a boy at } w')(w)]$

We suggest that these two propositions differ with respect to the ease with which listeners can accommodate them. In particular, accommodating the existence of a property is a relatively routine task, which does not undermine the felicity of the question that presupposes this proposition; by contrast, accommodating the presence of a polarity function is a much harder task, which goes through smoothly only if the issue  $\{p, \neg p\}$  has already been risen. While providing a detailed account of reason explaining this difference goes beyond the scope of the current paper, we observe that this constraint on polarity focus in discourse-initial position bears intuitive resemblance to a general Economy Principle that penalizes the use of meta-conversational moves out of the blue, when the issue has not been raised explicitly in the previous discourse (Romero and Han 2004).

- (19) *Principle of Economy*: Do not use a meta-conversational move unless necessary (to resolve epistemic conflict or to ensure Quality).

For example, the authors suggest that using an epistemic adverb like *really* to express commitment to adding a proposition to the Common Ground expresses a contribution that is already encoded in any assertion, hence potentially trivial; this contribution is felicitous only as long as the previous discourse explicitly called for the use of these expressions, for example raising the issue around *p*.

- (20) a. #I *really* am going to eat outside tonight. Out of the blue  
 b. A: I don't believe you are going out tonight!  
 B: Yes! I *really* am going to eat outside tonight! Issue already risen

While Polarity functions do not qualify as meta-conversational moves in the sense of *really*, they similarly run the risk of providing a redundant contribution. Since propositions inherently have a polarity value in their logical form, and since the alternative set of this value is trivially closed, focusing on such a value amounts to providing a redundant contribution, unless the development of the previous discourse calls for emphasis on it—for example, if the issue around the polarity of the proposition has already been raised. The same does not hold for property focus. While it is arguably true that “boy” only has another element in its alternative set (i.e., “girl”), the speaker could have chosen among many other types of properties to fill that slot; as such, focusing on the property is felicitous also in situations in which the issue had not been raised in previous discourse.

## 6.2. Explaining Part 2: \*Repeat

Concerning NAQs' observed inability to license follow up questions, we suggested that it can be seen as an artifact of a general pragmatic principle that penalizes the felicity of inquisitive strategies that were previously unsuccessful in discourse; this naturally applies regardless of whether such strategies were preceded by a NAQ or a CAQ. Supporting this claim is the observation that multiple strategies are available for the speaker to follow up to a NAQ/CAQ with another question, such as placing special emphasis on the question, or switching to a different question form. We labeled this principle \*Repeat.

- (21) \*Repeat: When pursuing an issue, avoid re-using a strategy that previously didn't help solve the issue.

The upshot is that Part 2 of cornering is linked to the optimal strategies that the speaker should pursue to solve the QUD. As such, the infelicity of follow up PQs observed in the previous literature emerges as a side effect of NAQs' licensing conditions: since NAQs always need to come after a move that raised the issue—which in many cases happens to be a PQ, as in Experiment 1—a follow up move of the identical type—e.g., another PQ—will automatically cause a violation of \*Repeat, leading to infelicity. Once again, we believe that this principle applies beyond the domain of alternative questions. While more research would be needed to explore its implications in other realms, we observe that it also appears to be at work with imperatives as well. In the following context, for example, it seems natural for the speaker to resort to a different strategy to express a command, once the previous attempts failed. To keep using the same command, by contrast, appears to be an example of irrational linguistic behavior.

- (22) A: Stop playing!  
 B: [Keeps playing]  
 A: Hey, can you stop playing?  
 B: [Keeps playing]
- a. A: # Stop playing!  
 b. A': I told you to stop playing

## 7. Conclusion

We have provided evidence supporting the following hypothesis: both effects of cornering are not linked to the distinctive properties of negative alternative questions, but rather stem from general pragmatic principles that govern communication across constructions. As we leave a more detailed modeling of how these principles interact with the compositional properties of different question types, we hope that these results will contribute to fueling further inquiry aimed at understanding how linguistic constructions with seemingly similar logical properties differentially shape the discourse space in interaction.

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