

Aren't Positive and Negative Polar Questions the Same?

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1 Introduction

In this paper we discuss and analyze the semantic and pragmatic properties of different types of *polar questions* (vulgo: yes/no questions), in particular the differences between *positive polar questions* as in (1a) and (1c) and their corresponding *negative polar questions* such as (1b).

- (1) a. PPQ: Is she left-handed?
- b. NPQ: Isn't she left-handed?
- c. PPQ: Is she right-handed?

On accounts of question meaning such as Hamblin (1973), the meaning of all three questions in (1) is the same, namely the set containing the two propositions in (2):

- (2) meaning for (1):
- a. $\{w \mid \text{she is left-handed in } w \}$
- b. $\{w \mid \text{she is right-handed in } w \}$

This is so because the meaning of a polar question P is taken to be $\{\llbracket P' \rrbracket, W - \llbracket P' \rrbracket\}$, where P' is the declarative 'core' of P , e.g. *she is left-handed* for (1a), and W is the set of all possible worlds. Assuming, as we do here, that any individual is either left- or right-handed, it follows that $W - \llbracket \text{she is left-handed} \rrbracket = \llbracket \text{she is right handed} \rrbracket = \llbracket \text{she is not left-handed} \rrbracket$. Accordingly $\{\llbracket P' \rrbracket, W - \llbracket P' \rrbracket\}$ is the same for all three questions in (1).

The same is true *mutatis mutandis* for theories in which a question denotes (the set containing) its *true* answer(s), such as Wunderlich (1976), Karttunen (1977), or — *pace* orthogonal aspects of logical type — Groenendijk and Stokhof (1984): All three questions in (1) have the same denotation.

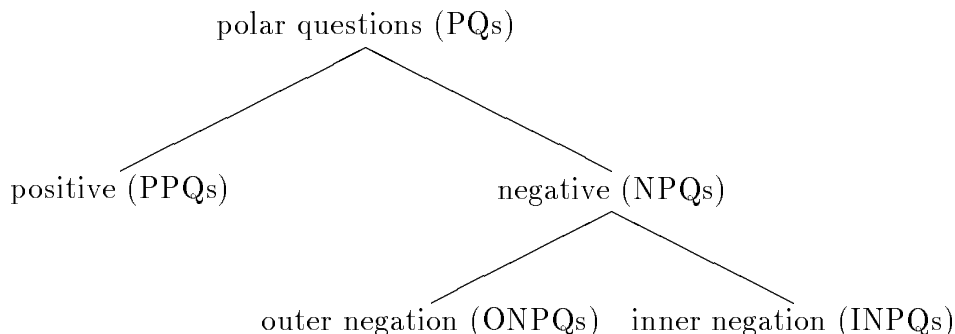
On an imaginable alternative approach, where the meaning of a polar question P is just $\{\llbracket P' \rrbracket\}$, at least (1a) has a meaning distinct from the other two, but (1b) and (1c) still end up meaning the same, namely $\{\{w \mid \text{she is right-handed in } w\}\}$.

We will show in this paper that neither of these predicted synonymies are real. All three question types show demonstrably different behavior in different contexts and must therefore

differ in their meaning.¹ Therefore, their semantic representations must be more complex than they are under the analyses just sketched.

Furthermore, following Ladd (1981), we argue that negative questions must themselves be further subdivided into two categories, *inner* vs. *outer*. We will explain this distinction in section 2 below. The overall typology of polar questions is given in (3):

(3)



The paper is organized as follows:

- We review Ladd’s inner/outer distinction and motivate it further, introducing new morphosyntactic data and tests from German and English in support of the distinction.
- We then investigate the felicity conditions of positive polar questions (PPQs) in detail, demonstrating the existence of a condition on use that needs to be stated in terms of what we call *contextual evidence*.
- We finally return to negative polar questions and show that the contextual evidence condition for PPQs is also relevant for negative questions, with related but distinct forms applying to INPQs and ONPQs, respectively.

2 Inner and Outer Negation: Ladd (1981)

Ladd (1981) observes that negative polar questions in English are systematically ambiguous between what he calls *inner* and *outer* negation. Let us consider Ladd’s original examples (the relevant polar question is highlighted in boldface):

(4) (Situation: Bob is visiting Kathleen and Jeff in Chicago while attending the CLS.)

Bob: I’d like to take you guys out to dinner while I’m here – we’d have time to go somewhere around here before the evening session tonight, don’t you think?

Kathleen: I guess, but there’s not really any place to go to in Hyde Park.

Bob: Oh, really, **isn’t there a vegetarian restaurant around here?**

Kathleen: No, about all we can get is hamburgers and souvlaki.

¹We crucially understand the term meaning in its comprehensive sense: The meaning of a sentence comprises whatever information is necessary to explain its effect on a discourse. We do not mean to imply that the meaning differences are of a simple truth-conditional type. [Note from CG to DB: I think this is too strong; we don’t want to say that a sentence *means* everything it can be used to convey - do we? Conversational implicatures, e.g.?

This — according to Ladd — is an example of *inner negation* polar question (INPQ), which he describes as follows:

“Bob uses the NQ here ... [because] he had previously assumed the truth of the proposition *there is a vegetarian restaurant around here*, but he has now inferred from what Kathleen says that this proposition is actually false, and is using the NQ to check this new inference.” (164f)

Generally, Ladd says, INPQs are used when “... the speaker has just inferred a proposition $\neg P$..., so what is being questioned is the inference $\neg P$ ” (165). Now let us contrast this with Ladd’s example of an *outer negation* polar question (ONPQ):

- (5) (Situation: Kathleen and Jeff have just come from Chicago on the Greyhound bus to visit Bob in Ithaca)
- Bob: You guys must be starving. You want to get something to eat?
- Kathleen: Yeah, **isn’t there a vegetarian restaurant around here** – Moosewood, or something like that?
- Bob: Gee, you’ve heard about Moosewood all the way out in Chicago, huh? OK, let’s go there.

In contradistinction to (4), Ladd claims: “Kathleen uses the negative question ... to ask for confirmation of something she believes to be true” (164). Generally, “... the speaker believes ... P and wants confirmation ... what is being questioned is the speaker’s belief P.” (165) These distinctions are summarized in the table in (6):

- (6) Summary of INPQ vs. ONPQ (p=‘there is a vegetarian restaurant around here’)

	background	speaker wants
INPQ	p is expected (Ladd: speaker used to believe that p)	confirmation for the inference that not-p
ONPQ	speaker believes that p	confirmation for p

We will have nothing to add to the conditions in the left column in (6) in this paper. We propose, however, to replace the ‘speaker wants’ conditions in the right column by conditions on *contextual evidence*, conditions that can actually be seen in the positive questions as well.

3 Morphosyntactic Probes into the Inner/Outer Negation Distinction

In the examples discussed in the previous section, the INPQs were string identical to the ONPQs. The distinction was characterized merely as a semantic/pragmatic intuition. However, as Ladd also points out, there are also morphosyntactic differences between the two negative question types. In this section we will discuss these. Of particular use in this context will be German, which shows the same distinction between INPQs and ONPQs as English, but provides more and clearer morphosyntactic diagnostics. These have, to the best of our knowledge, not been discussed before, so we will introduce them first.

3.1 German Polar Questions with Indefinites

In German, the sentential negation *nicht* and the indefinite article *ein* obligatorily amalgamate to *kein* ('no') (unless the article is accented, a case we'll ignore here). It seems that yes/no-questions are the only environment in which both the amalgamated and the non-amalgamated form are possible. In this case, the question with the non-amalgamated negation has the same 'pragmatic feel' to it as do Ladd's cases of outer negation:

- (7) a. Gibt es *nicht ein* vegetarisches Restaurant in dieser Ecke? (outNEG)
gives EXPL not a vegetarian restaurant in this corner
- b. Gibt es *kein* vegetarisches Restaurant in dieser Ecke? (inNEG)
gives EXPL no vegetarian restaurant in this corner

'Is there no/Isn't there any vegetarian restaurant around here?'

(7a), featuring the non-amalgamated *nicht ein* form is a request for confirmation of the proposition 'there is a vegetarian restaurant around here', in full parallelism with Ladd's example (5), an outer negation question. (7b) with the negative determiner *kein*, on the other hand, expresses that the speaker expects confirmation for the proposition 'there isn't a vegetarian restaurant around here', paralleling (4). We thus conclude that:

- (8) a. *nicht ein* (PQs only): outer negation
- b. *kein* (declaratives as well as PQs): inner negation

It is worthwhile to note that declarative sentences with *nicht ein* are unacceptable, even if used with rising intonation as questions (i.e. as *rising declaratives*, cf. Gunlogson (1999), Gunlogson (in prep.)). This shows that the possibility of an outer negation construal is confined to the *syntactic* category of interrogative rather than the *pragmatic* category of question:

- (9) a. Es gibt *kein* / **nicht ein* vegetarisches Restaurant in dieser Ecke.
*EXPL gives no *not a vegetarian restaurant in this corner*
- b. Es gibt *kein* / **nicht ein* vegetarisches Restaurant in dieser Ecke?
*EXPL gives no *not a vegetarian restaurant in this corner*

The relevance of these observations is that the *kein* - *nicht ein* distinction can be used as a direct *formal* indicator of the inner negation/outer negation distinction, the usefulness of which we will see later on.

3.2 Disambiguation in English

A very similar probe is found in English if we look at the distribution of the determiner *no* vis-à-vis *not some*. Generally *some* shows the behavior of a *positive polarity item* (PPI); it cannot occur in the scope of negative elements, as witnessed by the unacceptability of the *not some* variants in the ordinary declarative (10a), as well as the rising declarative (10b), cf. our earlier remarks regarding (9):

- (10) a. There is no/*isn't some vegetarian restaurant around here.
 b. There is no/*isn't some vegetarian restaurant around here?

In polar questions, however, *not some* is possible, cf. (11a). Strikingly, the interpretation of (11a) is unambiguously that of an ONPQ. Variant (11b) with *no*, on the other hand, must be interpreted as an INPQ. This is summarized in (12):

- (11) a. Isn't there some vegetarian restaurant around here?
 b. Is there no vegetarian restaurant around here?
- (12) a. *not some* (PQs only): outer negation
 b. *no* (declaratives as well as PQs): inner negation

3.3 Other Polarity Items

As Ladd (1981) noted, there are other polarity items that can serve to disambiguate inner and outer negation in polar questions. The presence of an NPI forces the inner negation reading, as in (13a), while the presence of a PPI forces the outer negation reading, as in (13b):

- (13) a. Isn't Jane coming either? (negative polarity item → inner negation)
 b. Isn't Jane coming too? (positive polarity item → outer negation)

Quoting from Ladd again: “In [13b] the speaker believes that Jane is coming, too, and just wants to confirm, whereas in [13a] the speaker had assumed that at least Jane would come and has now drawn the inference that, alas, Jane isn't coming either.” (Ladd (1981):166)

We can confirm Ladd's intuition by combining our two morphosyntactic probes. As expected, the determiner *no* — which we argue to be indicative of the inner negation — does not tolerate positive polarity items, while *not some* — claimed to be possible with outer negation only — doesn't cooccur with negative polarity items:

- (14) a. Is there no vegetarian restaurant either/*too?
 b. Isn't there some vegetarian restaurant *either/too?

Similar correlations between determiner choice and polarity can be found in German. The element we use here is the modal verb *brauchen*, ‘need’, in its infinitival-selecting variant. The contrast between (15a) and (15b) shows that *brauchen* is an NPI; (15c) furthermore demonstrates that it is not licensed in positive polar questions *simpliciter*:

- (15) a. * Sie *braucht* eine Entschuldigung mitzubringen.
she needs an excuse with-to-bring
 ‘She needs to bring an excuse.’
- b. Niemand *braucht* eine Entschuldigung mitzubringen.
nobody needs an excuse with-to-bring
 ‘Nobody needs to bring an excuse.’
- c. * *Braucht* sie eine Entschuldigung mitzubringen?
needs she an excuse with-to-bring
 ‘Does she need to bring an excuse?’

Similar to the English examples in (14), this NPI form *brauchen ... zu* cannot cooccur with the unambiguous outer negation form *nicht ein*:

- (16) *Brauchst Du keine/ *nicht eine Entschuldigung mitzubringen?*
*need you no/ *not a excuse with-to-bring*
 ‘Don’t you need to bring an excuse?’

Pre-theoretically, the intuition in these cases is that the proposition questioned in the ONPQs is a positive one, and that the negation is somehow ‘outside’ that proposition, hence unable to license NPIs.

Summarizing, we have shown in this section that the semantic intuitions described in section 2 are supported by morphosyntactic data. This supports the claim that the inner/outer distinction is a true case of ambiguity. Furthermore, the morphosyntactic probes will also help us to classify context types unambiguously in section 5. With this tool at our disposal let us now turn to a precise characterizations of the types of contexts that (dis)allow the different polar question types. We begin with the simplest case, ...

4 Positive Polar Questions

As a start, observe that PPQs are not (necessarily) neutral. To illustrate what we mean by this, let us refer to the proposition expressed by a polar question p as p' . The proposition expressed by *Is it raining*, for example, is the set of worlds in which it is raining, or, put differently, the proposition that it is raining. This is a purely terminological convention. Of course we do not want to claim that the question *Is it raining?* asserts that proposition. Just what happens with the proposition expressed by a polar question is an issue beyond the scope of this paper.

We noticed in the introduction that sometimes there are two different polar questions, p_1 and p_2 , such that the one expresses the opposite of the other, i.e. $p_1' = W - p_2'$ (with $W =$, again, the set of all worlds), or something close to it. The question *Is it sunny?* expresses a proposition p_1 which is (close to) the complement of the proposition p_2 expressed by *Is it raining?*, for example. We also pointed out that most theories of question semantics give such opposite questions the same meaning, for example the set of propositions $\{p', W - p'\}$. And at first glance, this identity in meaning seems to square well with the fact that in many contexts, such questions seem interchangeable and serve the same communicative purpose, for example in the following:

- (17) scenario: S(peaker) and A(addressee) are talking long-distance on the phone. (neutral context)
- a. S: What’s the weather like out there? Is it raining?
 - b. S: What’s the weather like out there? Is it sunny?

As indicated, we call the type of context illustrated in (17) a *neutral* context, because it doesn’t favor either of the propositions p_1 or p_2 . A neutral *question* would be a question p which,

similarly, doesn't 'favor' p' or $W - p'$ (i.e. which doesn't express any likelihood-assumption or -presupposition on the part of the speaker). Our point is that a positive polar question is not always neutral, as it seems to be in (17). Contrast the previous example with the following:

- (18) scenario: A enters S's windowless computer room wearing a dripping wet raincoat.
(contextual evidence for p ='it is raining')
- a. S: What's the weather like out there? Is it raining?
 - b. #S: What's the weather like out there? Is it sunny?

(18) is *not* a neutral context, and intuitively, that's what makes the question *Is it sunny?* infelicitous in it. We will say that in (18) there is *compelling contextual evidence* for the proposition that it is raining. A positive polar question expressing the proposition that it is sunny is evidently not possible in the face of such evidence against that proposition. We conclude that a PPQ p is *not* neutral; while it doesn't require a contextual bias for p' (remember (17)), it is incompatible with evidence against p' . This is summarized in the table in (19):

ex.	evidence	for	against	p ?	$W-p$?
(17)	none			Is it raining?	Is it sunny?
(18)	A's wet rain-coat	it is raining (= p)	it is sunny (= $W-p$)	Is it raining?	*Is it sunny?

To capture this behavior, we formulate the following *evidence condition*:

- (20) Evidence Condition on PPQ:
There is no compelling contextual evidence against p (i.e. there is either no evidence or evidence *for* p).

Obviously, we should say more about what exactly counts as compelling contextual evidence. Let us start by adopt the following characterization of 'contextual':

- (21) Contextual Evidence:
Evidence that has just become mutually available to the participants in the current discourse situation.

This definition excludes private beliefs of the participants as well as common knowledge which has been introduced into the common ground earlier on in the conversation, or which is there as a matter of convention. We will motivate this in a second.

As for 'compelling', while it is hard to make the notion precise, we submit (22) as a working definition:

- (22) Compelling:
- a. Evidence *for* p is compelling if, considered in isolation, it would allow the participants to assume p (i.e. the evidence could reasonably be considered to justify the inference that p).
 - b. Evidence *against* p is compelling if it is compelling evidence for the opposite of p , $W-p$.

Note the clause *in isolation* in (22a), which implies that compelling contextual evidence for p need not *de facto* convince the participants of p when confronted with it. If the participants have had previous good reasons to doubt p or even think that $W - p$ holds, compelling evidence to the contrary might merely re-open the case, or merely demand an extra bit of explanation for that evidence, compatible with both it and the assumption that p . Consider the following:

- (23) scenario: A and S have conducted a psycholinguistic experiment in which the subjects have all certified that they are right-handed. They encounter Carl, who they recognize as one of their subjects, cutting bread with his left hand.
- a. S: Is Carl left-handed?
 - b. ‡S: Is Carl right-handed?

In (23), the participants might very well believe, assume and expect Carl to be right-handed, raising the question only to invite commentary on why he’s using his left hand in this instance. That is, while Carl’s cutting bread with this left hand is compelling evidence in isolation, it doesn’t need to be in the actual conversation.

The second point illustrated in this example is that although both speakers believe (and mutually know each other to believe) that Carl is right-handed, the polar question expressing that he is, (23b), is infelicitous. The reason, we submit, is that it is not the propositions in the common ground (among which we assume there to be ‘Carl is right-handed’) that decide about the choice of question form, but the *contextual* evidence in the sense explained above. It is worth stressing this point, because we believe that examples like this stand in the way of expressing the prerequisite conditions for polar question using a standard Stalnakerian model of common ground and context (cf. Stalnaker (1978)).

5 Evidence in Negative Polar Questions

In this section we show that the notion of compelling contextual evidence is useful in formulating the felicity conditions for negative polar questions, too. We will investigate the contextual evidence requirements for outer and inner negation polar questions in turn.

In both cases, our strategy will be to try to embed a morphosyntactically unambiguous question (using the properties discussed in section 3 above) in neutral, positively and negatively biased contexts, and then see which question type is possible where. As before, we refer to the proposition expressed by a question p as p' . For negative polar question $\neg p$, both inner and outer, we assume that p' is the non-negated propositional content. This will be useful for comparison, but it is merely an expository device, and it is very important to be aware of this: While we do assume for the purpose of the exposition that *Is there a vegetarian restaurant around here?*, *Isn’t there some vegetarian restaurant around here?*, and *Is there no vegetarian restaurant around here?* all express the same p (‘there is a vegetarian restaurant around here’), we crucially do *not* assume that they have the same meaning. In fact, it is exactly the opposite that we argue for: All three types have different meanings, and neither $\{p', W - p'\}$ nor $\{p'\}$ nor $\{W - p'\}$ are sufficient as a representation of these meanings.

5.1 Evidence Condition for INPQs

The unambiguously inner negation questions we use here are ones involving the negative determiners *no* and *kein*, respectively. In accordance with the above convention, p here is ‘there is a vegetarian restaurant around here’. Our first experiment is to embed this in a neutral context:

- (24) context: A and S want to go out for dinner
 A: Where do you want to go for dinner? (neutral with respect to p)
- a. ‡S: Is there no vegetarian restaurant around here?
 b. ‡S: Gibt es hier kein vegetarisches Restaurant?
gives EXPL here no vegetarian restaurant

Clearly, the INPQ is inappropriate in this context. Note again that this result is unexpected if one holds the assumption that a PPQ expressing p' and a NPQ expressing p' have the same denotation; whatever the exact conditions on the use of these question types are, they need to make reference to a more articulated representation of the question meaning.

Let us now go on to investigate context which do display compelling contextual evidence, starting with the case where the evidence favors p' :

- (25) A and S want to go out for dinner.
 A: I bet we can find any type of restaurant you can think of in this city. Make your choice! (compelling contextual evidence for p')
- a. ‡S: Is there no vegetarian restaurant around here?
 b. ‡S: Gibt es hier kein vegetarisches Restaurant?
gives EXPL here no vegetarian restaurant

Again, we diagnose infelicity. Finally, what about the case in which p and the compelling contextual evidence clash? This seems the only configuration in which the INPQ is acceptable:

- (26) A and S want to go out for dinner.
 A: Since you guys are vegetarians, we can't go out in this town, where it's all meat and potatoes. (compelling contextual evidence against p)
- a. S: Is there no vegetarian restaurant around here?
 b. S: Gibt es hier kein vegetarisches Restaurant?
gives EXPL here no vegetarian restaurant

The results of all three cases are summarized in the table in (27); they lead us to formulate the Evidence Condition in (28):

	Contextual Evidence	INPQ $\neg p$?
(24)	none	*
(25)	there is a vegetarian restaurant	*
(26)	there is no vegetarian restaurant	ok

- (28) Evidence Condition on INPQ $\neg p$?:
 There is compelling contextual evidence *against* p .

We would like to emphasize what we believe to be an important point: The condition for INPQs in (28) is not just the inverse of that for PPQs in (20). It might be tempting to think that since the INPQ contains p plus a negation, and hence might be taken to express $W - p'$, it should be expected that it can't occur in a context that is biased towards p' any more than the PPQ can in a context that is biased against p' . While this might be true, it doesn't explain why the PPQ, but not the INPQ, is possible in the neutral case. So the condition on INPQs in (28) cannot be reduced to the condition on PPQs in (20) applied to $W - p'$ instead of p' .²

Before closing this subsection, let us point out another interesting property of INPQs: Independent of its contextual evidence condition, an INPQ $\neg p$? has the implication that p' is expected in the general case. For example, vegetarian restaurants must be considered pretty standard for (26) to work. Unfortunately we won't be able to discuss this effect further in this paper; our conditions will be formulated assuming that it is orthogonal to the contextual evidence effects we discuss here.

5.2 Evidence Condition for ONPQs

To test the behavior of ONPQs in the various context types, we use the unambiguous outer negation markers *not some* and *nicht ein*, respectively. Our p' , again, will be 'there is a vegetarian restaurant'. Our first finding is that ONPQs, unlike INPQs, but like PPQs, are acceptable in neutral contexts:

- (29) A and S want to go out for dinner. S has been to Moosewood a couple of years back.
 A: Where do you want to go for dinner? (neutral with respect to p')
- a. S: Isn't there some vegetarian restaurant around here?
 - b. S: Gibt es hier nicht ein vegetarisches Restaurant?
gives EXPL here not a vegetarian restaurant

Second, ONPQs, like INPQs, but unlike PPQs, don't tolerate evidence for p' :

- (30) A and S want to go out for dinner. S has been to Moosewood a couple of years back.
 A: I bet we can find any type of restaurant you can think of in this city. Make your choice! (evidence for p')
- a. ‡S: Isn't there some vegetarian restaurant around here?
 - b. ‡S: Gibt es hier nicht ein vegetarisches Restaurant?
gives EXPL here not a vegetarian restaurant

²An interesting possibility which we won't explore in this paper is to assume that the two conditions are in fact mirror images of each other, and that the infelicity of INPQs in neutral contexts is not due to the workings of the evidence condition, but to some kind of blocking of the morphosyntactically marked form by the unmarked one, where possible. It should be borne in mind, though, that the existence of PPQs expressing $W - p'$ (e.g. *Is John right-handed?*) doesn't generally block the occurrence of the (morphosyntactically marked) NPQ expressing p' (here: *Isn't John left-handed?*).

And third, ONPQs pattern with INPQs (and against PPQs) in occurring happily in the face of evidence against p' :

- (31) A and S want to go out for dinner. S has been to Moosewood a couple of years back.
 A: Since you guys are vegetarians, we can't go out in this town, where it's all meat and potatoes. (evidence against p')
- a. S: Isn't there some vegetarian restaurant around here?
 b. S: Gibt es hier nicht ein vegetarisches Restaurant?
gives EXPL here not a vegetarian restaurant

We summarize this in a table, (32) below:

	contextual evidence	ONPQ $\neg p'$?
(24)	none	ok
(25)	there is a vegetarian restaurant	*
(26)	there is no vegetarian restaurant	ok

The Evidence Condition to capture the behavior of ONPQs is ...

- (33) Evidence Condition on ONPQ $\neg p'$?
 There is no compelling contextual evidence for p (i.e. there is either no evidence or evidence *against* p).

By way of another aside we note an additional aspect of the meaning of ONPQs as well: An ONPQ $\neg p'$ has the implication that the speaker believes that p' . This is deliberately phrased in stronger terms than the similar implication of INPQs noted in subsection (5.1) above: To use an ONPQ $\neg p'$, the speaker must not just expect p' on general grounds, but have particular (and possible private) evidence for the very fact that p' . In none of the examples above could S use the ONPQ just on the grounds that vegetarian restaurants are generally widespread these days. Again, closer investigation of this aspect of the meaning of ONPQs has to await a later occasion.

6 Summary

We have examined the three polar question types in the three different context types. In each case, we found effects of compelling contextual evidence on the felicity. These results are summarized in the table in (34):

	contextual evidence	PPQ	ONPQ	INPQ
(34)	for p'	ok	*	*
	neutral	ok	ok	*
	against p'	*	ok	ok

This lead us to formulate the following conditions on the respective question types:

(35) Evidence Conditions:

- a. PPQ: there is no compelling evidence against p'
- b. ONPQ: there is no compelling evidence for p'
- c. INPQ: there is compelling evidence against p'

We believe that the differences among these conditions suggest that the discourse semantics need to have access to the distinction between a positive polar question that expresses p' , one that expresses $W - p'$, and the two types of negative polar questions, inner and outer. As pointed out earlier, standard accounts of polar interrogative meanings, even if slightly changed, do not provide this distinction. Most likely, a structured semantic representation is called for; such a richer representation may also allow us to unify the three conditions in (35), as we speculate in the appendix.

Summarizing our main conclusions, then:

- Positive polar questions p are not completely neutral, but show an incompatibility with contexts that provide compelling evidence against p .
- Morphosyntactic data from English and German confirm Ladd's original distinction between outer and inner negation polar questions and at the same time provide us with a diagnostic for context types that does not rely on semantic intuitions alone.
- Closer investigation of the contexts in which the two types of NPQs are (im)possible reveals two conditions which — although not obviously reducible to the PPQ condition — make reference to a notion of Compelling Contextual Evidence, too.

7 Appendix

As it stand, the evidence conditions in (35), despite their formal similarities, seem rather arbitrary. Clearly, it would be desirable to derive these different conditions from the interaction of one basic condition with the particular morphosyntactic shapes of the three question types.

At present, we do not have a satisfactory account of that sort to offer. To illustrate the kind of unification we'd be looking for, consider (36):

(36) Let $E := \lambda p[\text{there is no compelling evidence against } p]$

- a. PPQ : $E(p)$
- b. INPQ : $\neg E(p)$
- c. ONPQ : $E(\neg p)$

Here, we've given one 'proto-condition' in (36), which is applied to positive question in (a), a negated question in (c) and is itself negated after application to a positive question in (b). The reader may verify that the resulting conditions are in fact the ones given earlier for PPQs, INPQs, and ONPQs, respectively.

Suppose now, that we represent a polar question meaning by an ordered pair, consisting of a function in $D_{\langle t, t \rangle}$ and a proposition. For the positive question, that function is simply the identity function on propositions, and the proposition is the one expressed by the question, cf. (37a). Inner and outer negation polar questions differ in whether the negation is mapped onto the function, (37b), or the proposition, (37c). In the latter case, we get the identity function again, and the complement proposition. In the former we get the proposition expressed, and a function corresponding to the logical negation:

- (37) a. PPQ: $\langle \lambda q. q, p' \rangle$
 b. INPQ: $\langle \lambda q. \neg q, p' \rangle$
 c. ONPQ: $\langle \lambda q. q, \neg p' \rangle$
 where p' is e.g. $\{w \in W \mid \text{there is a vegetarian restaurant in } w\}$

We can now use these structured representations to arrive at the three conditions from (36) above, by stating the evidence condition as in (38):³

- (38) Evidence Condition on Polar Questions:
 Let $q' = \langle r, p \rangle$ be the meaning representation for a polar question Q , then Q is felicitous in a context C only if the following holds:
 $r(\text{there is no compelling evidence against } p \text{ in } C)$

The reader is invited to verify that (38), applied to either one of the representations in (37), yields the corresponding formula in (36), hence the original evidence condition.

The problem we see with this particular treatment is that it is unclear why the three question types should be represented exactly as in (37), or how to derive these representations compositionally. Note that it is the outer negation polar question for which the negation is applied directly to the proposition expressed, whereas it is the inner negation polar question for which the negation is mapped onto the function. Intuitively, this should be the other way around. It is for example the outer negation question that shows a free-standing negation, whereas the inner one can have a determiner negation. Also, the ONPQ allows for positive polarity items, while the INPQ licenses negative polarity items. For these and other reasons we are less than satisfied with the unification achieved in (38), but this is all we have to offer at present.

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³These representations assume that D_t is the set of all propositions, the power set of W , and that \neg is interpreted as the complement-forming operation on D_t .

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