Negative Polar Question Types in English

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Background. The polar question (PQ) forms in (1a-c) raise the same issue $\{p, \neg p\}$ but cannot be used interchangeably. While (1a) can be used in a completely unbiased way, the forms (1b,c) convey that the speaker is epistemically biased, based on her original belief (original bias in [L], [R&H]), based on newly acquired contextual evidence (evidence bias in [B&G]) or on a combination of both. Furthermore, (1c) has been claimed to be ambiguous between an inner-negation reading double-checking $\neg p$ and an outer-negation reading double-checking p, disambiguated by the presence of NPIs and PPIs respectively [L]: (2). However, while the literature converges in considering the negative forms (1b,c)-(2) as carrying bias, there is blatant disagreement as to what PQ forms share a joint bias profile and what forms have distinct separate bias profiles, with the four possible splits in (3) represented in the literature.

(1) a. Did John drink? **PosQ**
b. Did John not drink? **LowNQ**
c. Didn't John drink? **HiNQ**

(2) a. Didn't John drink any beer? **Inner HiNQ**
b. Didn't John drink some beer? **Outer HiNQ**

(3)

(i)	LowNQ	Inner HiNQ	Outer HiNQ	[vR&S]
(ii)	LowNQ	Inner HiNQ	Outer HiNQ	[Kr]
(iii)	LowNQ	Inner HiNQ	Outer HiNQ	[A, N]
(iv)	LowNQ	Inner HiNQ	Outer HiNQ	[R&H, R]

Our goal is to provide experimental evidence for split (3.iv) in English. In Study 1, we show that the predictions of lines (i) and (ii) are falsified in several bias conditions. In Study 2, we show that disambiguation of (1c) correlates with prosody (height of final boundary tone) and argue that this can be easily explained in line (iv) but not in line (iii).

Study 1. Consider the four pragmatic conditions in (4), with two possible values for original bias on the x axis —for p and n(eutral)— and two values for evidence bias on the y axis — n(eutral) and for $\neg p$— and with the n/n as the control PosQ cell. Regarding **split (i)**, [vR&S] treat all three negative question forms $\neg p$*?* uniformly as requiring that the utility value of $\neg p$ be higher than that of p. Concentrating on cases where utility is based solely on informativity, this means LowNQs and HiNQs are predicted to be equally acceptable when there is an original bias for p, i.e., in conditions p/n and $p/\neg p$ (since an expectation towards p makes $\neg p$ highly informative) and to be equally dispreferred when there is no original bias and there is contextual evidence for $\neg p$, i.e., in condition n/$\neg p$ (since the speaker's expectation, if any, is now towards $\neg p$ and this makes $\neg p$ little informative). These predictions are summarized in (4). As for **split (ii)**, [Kr] treats HiNQs under the double-checking-p reading and LowNQs as having the same underlying structure [REQUEST [ASSERT ¬p]]], which he argues is felicitous with evidence bias for $\neg p$. This means that, in the n/$\neg p$ cell, both HiNQs and LowNQs are predicted to be equally felicitous, as summarized in (5). To test this, we run a production experiment in which participants chose the best PQ form in the different bias combinations, with the results in Fig. 1 [DRB]. Neither the general parallelism between LowQs and HiNQs predicted by [vR&S] nor the restricted parallelism predicted by [Kr] is borne out. Instead, LowNQs and HiNQs were selected as preferred choice in different conditions.

(4)

	p	n
n	✓LowNQ ✓HiNQ	✓PosQ
$\neg p$	✓LowNQ ✓HiNQ	#LowQ #HiNQ

(5)

	p	n
n		✓PosQ
$\neg p$		✓LowNQ ✓HiNQ

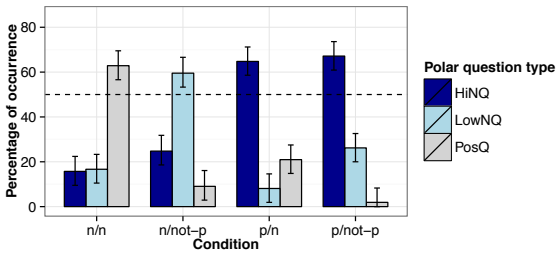

Fig. 1: Results of Study 1.

Study 2. Consider Ladd's (1981) HiNQ examples in (6)-(7), without NPIs/PPIs:

(6) A: You guys must be starving. You want to get something to eat?
S: Yeah, isn't there a vegetarian restaurant around here? **Outer HiNQ**

(7) S: 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?
A: I guess, but there's not really any place to go in Hyde Park.
S: Oh, really, isn't there a vegetarian restaurant around here? **Inner HiNQ**

These sentences are (roughly) analysed in lines (iii) and (iv) as follows. In **split (iv)**, preposing of negation introduces the VERUM operator: (8). Negation itself may scope over VERUM (or merge with it as FALSUM) or under VERUM: (9). The structure (9a) asks the A(ddressee) for doubts about *p*, which means that the proposition the question is about –i.e., the prejacent– is *p*. This corresponds to the reading of (6S). The structure (9b) asks A for full evidence for ¬*p*, which means that the prejacent of the question is ¬*p*. This corresponds to (7S). The two readings are disambiguated by PPIs/NPIs and possibly by other means.

(8) $[\![\text{VERUM}]\!] = \lambda p_{<s,t>}.\lambda w_s.\ \forall w' \in \text{Epi}_x(w)\ [\ \forall w'' \in \text{Conv}_x(w')\ [\ p \in \text{CG}_{w''}]\ ]$

(9) a. [Q [¬ VERUM [p]]] b. [Q [VERUM [¬ p]]]

In **split (iii)**, the lexical entry for high negation, abbreviated as $\neg_{hi}$, includes VERUM as one of its ingredients. All HiNQs unambiguously have the structure (10), i.e., the prejacent is invariably proposition *p*. By default, S(peaker) has a bias for retaining her original *p*, which gives us the reading of (6S). Deviating from this default requires an NPI –whose pragmatic properties will bring about the intended interpretation in (7S) – or other overt marking.

(10) [Q $\neg_{hi}$ p]

We designed an experiment to test what other linguistic marking disambiguates the two interpretations. In contradiction scenarios in which S originally believed and still firmly endorses *p* and A implies ¬*p,* subjects chose between HiNQ and LowNQ to check their own proposition ("Mine") or A's proposition ("Other's") and produced it. Speakers preferred HiNQ, but differed in prosodic realization (height of final boundary tone), as shown in Fig. 2.

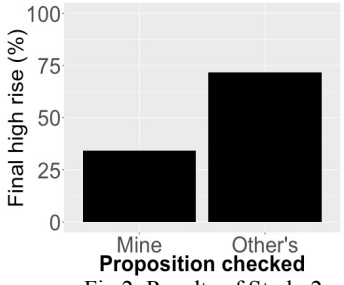

Fig.2. Results of Study 2

How can these prosodic findings be explained in splits (iv) and (iii)? It has been noted that reverse-polarity tags, which also convey an original speaker bias towards the prejacent, can be pronounced with rising or non-rising (falling) intonation. According to [F&R], a final rise signals that S's conditional commitment to the prejacent proposition is weak and a final fall that S's conditional commitment to the prejacent is strong. Combining this idea with the analyses in **split (iv)** derives the correct results. In uttering a HiNQ, S makes a conditional commitment to the prejacent. Since S still firmly endorses her original belief *p*, her conditional commitment is weak towards ¬*p* and strong towards *p*; hence, the HiNQ is usually pronounced with a rise if the prejacent is ¬*p* and with a non-rise if the prejacent is *p*. However, **split (iii)** has problems incorporating these findings. Since the prejacent proposition is always *p*, having an outer or inner HiNQ interpretation should make no difference: the two conditions should show parallel preference for non-rising final boundary tones.

REFERENCES. **[B&G]** Büring & Gunlogson. 2000. *Aren't positive and negative polar questions the same?* **[DRB]** Domaneschi, Romero & Braun (subm.) Bias in polar question: Evidence from English and German production experiments. **[F&R]** Farkas & Roelofsen (subm). Division of labor in the interpretation of declaratives and interrogatives. **[Kr]** Krifka (to appear). Negated polarity questions as denegations of assertions, ms. **[L]** Ladd 1981. A first look at the semantics and pragmatics of negative questions and tag questions, *CLS 17*. **[N]** Northrup. 2014. *Grounds for commitments*, UCSC diss. **[R]** Repp. (2013). Common ground management: modal particles, illocutionary negation and VERUM. In Gutzmann & Gaertner, eds. **[R&H]** Romero & Han 2004. On negative yes/no questions. *L&P* 27. **[vR&S]** van Rooij & Šafárová 2003. On polar questions, *SALT 13.*