

BIAS IN POLAR QUESTIONS

AN EMPIRICAL CHARACTERIZATION OF PQS IN GERMAN AND ENGLISH

1. TYPOLOGY OF POLAR QUESTIONS (POLQs). Traditionally, a positive question (PosQ) like (1a) and a negative question with low negation (LowNQ) like (1b) are assigned the same semantic representation: the set of possible answers $\{p, \neg p\}$ (where p = “that Jane is coming”). However, (1a) and (1b) cannot be used interchangeably. Similarly, in the standard analysis of negation, the full form *not* and the cliticized form *n’t* receive the same semantic denotation: $\lambda p. \neg p$. Nevertheless, the utterance meaning of (1b) and of (1c) is not identical.

- (1) a. Is Jane coming? b. Is Jane not coming? c. Isn’t Jane coming?

Furthermore, Ladd [4] observes that high negation questions (HiNQs) like (1c) and (2) are ambiguous between (i) an outer negation reading (OuterHiNQ) by which the speaker double-checks the proposition p , and (ii) an inner negation reading (InnerHiNQ) double-checking proposition $\neg p$. The presence of e.g. *some* vs. *any* disambiguates the reading: (2a,b).

- (2) Isn’t there a restaurant near here?
 a. Isn’t there some restaurant near here? OUTERHINQ double-checking [**p?**]
 b. Isn’t there any restaurant near here? INNERHINQ double-checking [**¬p?**]

Another kind of PosQs is discussed by [6]: PosQs with *really* and/or focus on the verb (*really*-PosQ):

- (3) a. Is Jane really coming? b. [IS]_{Focus} Jane coming?

In sum, the polar question types discussed in the current literature are the following:

- (4) a. POSQ: Is Jane coming? c. LOWNQ: Is Jane not coming?
 b. *REALLY*-POSQ: Is Jane really coming? / d. INNERHINQ: Isn’t Jane coming?
 [IS]_{Focus} Jane coming e. OUTERHINQ: Isn’t Jane coming?

2. TWO KINDS OF BIAS. To characterize the pragmatic import of different PolQ types, two kinds of bias have been discussed in the literature. First, Büring and Gunlogson [2] investigate the impact of newly-acquired **evidence bias** on the question types (4a,c,e): (i) a PosQ $p?$ is incompatible with evidence bias against p , (ii) a LowNQ requires evidence against p , and (iii) an outer HiNQ is incompatible with evidence for p . This is summarized in Table 1.

Contextual evidence	PosQ $p?$	LowNQ <i>Not p?</i>	Outer HiNQ $n't p + PPI?$
for p	✓	*	*
neutral	✓	*	✓
against p	*	✓	✓

Table 1. Büring and Gunlogson’s [1] typology and characterization.

	PosQ $p?$	<i>really</i> -PosQ <i>Really p?</i>	LowNQ <i>Not p?</i>	Inner HiNQ $n't p + NPI?$	Outer HiNQ $n't p + PPI?$
Possibly unbiased	✓	*	✓	*	*
Original bias for ...		$\neg p$		p	p
Q double-checks...		p		$\neg p$	p

Table 2. Romero and Han’s [5] typology and characterization.

Second, Romero and Han [6] investigate **original epistemic bias** in the question types (4a-e): (i) PosQs and LowNQs are compatible with there being no original bias, (ii) *really*-PosQs require original bias for $\neg p$ and are used to double-check p ; (iii) HiNQs require original bias for p and, following [4], are ambiguous between an inner negation reading double-checking $\neg p$ and an outer negation reading double-checking p . This is summarized in Table 2.

After these pioneering works, the typology and the pragmatic characterization of PolQs has become a controversial issue. There is blatant disagreement as to what PolQ types need to be distinguished: (4c,d,e) have been treated as one single type in [7], for instance, (4c,d) have been merged in [3, 1] and (4d,e) have been argued to be one single grammatical category [0]. Furthermore, it is not clear how the two types of bias interact, since most authors consider only a subset of the data and analyse them only for one kind of bias [2, 3, 6, 7].

4. GOAL AND RESEARCH QUESTION. The goal of the present paper is to establish the typology and empirical pragmatic characterization of PolQs using experimental methodology. Several cues in the surface form of polar interrogatives and several pragmatic factors play a crucial role: the relative position of negation (high vs. low), the presence of *really*, the original bias of the speaker and the newly-acquired bias arising from contextual evidence. Current theoretical and experimental studies, however, are fragmentary in (at least) the following two ways ([3], [5]): they cover only a subset of the PolQ types and they refer only to some pragmatic factors. We have therefore designed an experiment aimed at investigating in a unique design which linguistic forms of PolQs are selected depending on the combination between original bias/evidence bias in critical conditions. In this first experiment, we haven’t taken into account the distinction between InnerHiNQ and OuterHiNQ but we have used only HiNQ without the presence of PPI or NPI to avoid multiplying the conditions more than necessary.

5. METHODS & DESIGN. The experiments have been run in English and German (to compare, in particular, the occurrence of Low vs. High negation in two languages) with 42 participants each. For each language, there were six

experimental lists, rotating original bias and contextual evidence in trials following a Latin Square (see Tab. 3 for conditions). Each participant performed 7 trials in each of the 6 conditions. Participants read two captions attached to two pictures (see example below), which presented short fictional scenarios, and selected from a list of five PolQs the one that sounded most natural or used the category “Other” if none of the choices fitted. The captions were the same across conditions but the pictures varied to generate three different original epistemic biases in the first case (i.e. p , neutral, $\neg p$ with respect to the proposition p expressed by the PolQs), and three different evidence biases in the second case (i.e. p , neutral, $\neg p$).

		ORIGINAL BIAS			
			p	Neutral	$\neg p$
EVIDENCE BIAS	$\neg p$		Inner/OuterHiNQ	LowNQ	//
	Neutral		OuterHiNQ	PosQ	//
	p		//	PosQ	really-PosQ

Table 3. Overview of the experimental conditions tested

We advance two hypotheses:

Hyp I. The four question types (4a), (4b), (4c) and (4d,e) need to be distinguished (both in German and in English).

Hyp II. Evidence bias and original epistemic bias are two different kinds of bias, each impacting on the choice of question in a different way.

Example of a template: p = “It is raining”

CAPTION 1: “If it doesn't rain tomorrow, you will surely go to the beach. The forecast for the next morning indicates:”

p =  90% raining

Neutral =  50% raining / 50% sun

$\neg p$ =  90% sun

CAPTION 2: “The day after, your flatmate Sam comes from the outside and enters your bedroom...”

$\neg p$ =  ...with sunglasses and diver's mask

Neutral =  ...saying: “What are we gonna do today?”

p =  ...with an umbrella

TASK: “What question would you ask to find out if it's raining? Select the sentence that sounds most natural and pronounce it”: “Is it raining?”, “Really? Is it raining?”, “Is it not raining?”, “Isn't it raining?”, “Other ways of asking if it is raining”.

7. RESULTS. Data collected support three main results:

(i) Each combination of evidence bias and original epistemic bias has impacted significantly on the choice of the question type, both in English and in German, see Tab. 4 and Tab. 5 which list the most frequent choices. Hence, both factors seem to play a crucial role, in contrast with what is claimed by the accounts where both kinds of bias are merged (e.g. [7]).

(ii) LowNQs and HiNQs are truly different types of PQs – i.e. they are selected in different conditions – unlike what is assumed by [7], [3] and [1].

(iii) Interestingly, the preferred choices are very similar in both languages. Unexpectedly (with respect to the provisions offered by [6]), however, PosQs and Really-PosQs appear to be equally good PolQs in conditions with no original bias and positive contextual evidence. Possibly, these two forms are disambiguated by prosody. Only one cross-linguistic difference is observed: in German, participants do not have a preference over HiNQ and LowNQ in conditions in which a positive original bias is combined with negative contextual evidence but in English, HiNQs are the prime choice.

7. REFERENCES. [0] AnderBois (2011). *Issues and Alternatives*. Diss. UC S. Diego. [1] Asher & Reese (2007). “Intonation and Discourse: Biased Questions”. In S. Ishihara, S. Jannedy & A. Schwarz (eds.), *Interdisciplinary Studies on Information Structure*, 8:1-38. [2] Büring & Gunlogson. (2000). *Aren't Positive and Negative Polar Questions the Same?* Ms. UCSC. [3] Krifka (forth). *Negated Polarity Questions as Denegations of Assertions*. In Kiefer et al. (eds.), *Contrastiveness and scalar implicatures*. Springer. [4] Ladd (1981). “A First Look at the Semantics and Pragmatics of Negative Questions and Tag Questions”. *Proceedings of CLS*, 17:164-171. [5] Roelofsen, et al. (2012). *Positive and negative questions in discourse*. *Proceedings of SuB 17*: 455-472. [6] Romero & Han (2004). *On Negative Yes/No Questions*. *L&P* 27:609-6. [7] van Rooij & Šafařová (2003). *On polar questions*. *Proceedings of SALT* 13.

		ORIGINAL BIAS			
			p	Neutral	$\neg p$
CONTEXTUAL EVIDENCE	p		//	PosQ / Really-PosQ	Really-PosQ
	Neutral		HiNQ	PosQ	//
	$\neg p$		LowNQ / HiNQ	LowNQ	//

Table 4. Overview of the PQs selected in each condition in German

		ORIGINAL BIAS			
			p	Neutral	$\neg p$
CONTEXTUAL EVIDENCE	p		//	PosQ / Really-PosQ	Really-PosQ
	Neutral		HiNQ	PosQ	//
	$\neg p$		HiNQ	LowNQ	//

Table 5. Overview of the PQs selected in each condition in English