

# On further delimiting the space of bias profiles for polar interrogatives

Hans-Martin Gärtner & Beáta Gyuris

## Abstract

In Gärtner & Gyuris (2017) we defined the “bias profile” of an individual polar interrogative clause type as a non-empty choice from the power sets of evidential bias options,  $(\wp(\{+^{ev}, -^{ev}, \%^{ev}\}) - \{\emptyset\})$ , and epistemic bias options,  $(\wp(\{+^{ep}, -^{ep}, \%^{ep}\}) - \{\emptyset\})$ , for each of its expressive instantiations as positive polar question (PPQ), and negative polar questions with inside (IN-NPQ) and outside negation (ON-NPQ) in the sense of Ladd (1981). By simple arithmetic we predicted the existence of  $(7 \times 7)^3 = 117649$  such bias profiles.

We then explored the “space” of bias profiles and demonstrated a numerical reduction to just  $(4 \times 2)^3 = 512$  permissible types. This was based on differential choices from the sets of evidential and epistemic biases, formulated in terms of the principle of *Static Complementarity* (together with the principle of *Convexity*). In the current brief note, we will show how to considerably cut down options further by in addition imposing a bi-uniqueness constraint on the evidential bias of IN-NPQs.

## 1 Introduction

In Gärtner & Gyuris (2017) we formally defined the “bias profile” for a polar interrogative clause type as a particular non-empty choice from the power sets of evidential bias options  $(\wp(\{+^{ev}, -^{ev}, \%^{ev}\}) - \{\emptyset\})$  and epistemic bias options,  $(\wp(\{+^{ep}, -^{ep}, \%^{ep}\}) - \{\emptyset\})$  for each of its expressive instantiations as positive polar question (PPQ), and negative polar questions with inside (IN-NPQ) and outside negation (ON-NPQ) in the sense of Ladd (1981). As one illustration, we chose Japanese *no*-Interrogatives, i. e., polar interrogative clauses containing the final particle *no*:

- (1) Japanese *no*-Interrogative (Sudo 2013: 288)
  - a. PPQ:  $\langle \{+^{ev}\}, \{+^{ep}, -^{ep}, \%^{ep}\} \rangle$
  - b. IN-NPQ:  $\langle \{-^{ev}\}, \{+^{ep}\} \rangle$
  - c. ON-NPQ:  $\langle \{+^{ev}, -^{ev}, \%^{ev}\}, \{+^{ep}\} \rangle$

(1) says that uses of Japanese *no*-interrogatives expressing PPQs ( $?p$ ) require contextual evidence supporting  $p$ , and they are compatible with the speaker believing  $p$ , believing  $\neg p$ , or being “agnostic” about whether  $p$  or  $\neg p$ . Uses of Japanese *no*-interrogatives expressing IN-NPQs ( $? \neg p$ ) require contextual evidence supporting

$\neg p$  and are only compatible with the speaker's (prior) belief/expectation that  $p$ . Finally, uses of Japanese *no*-interrogatives expressing ON-NPQs ( $? \sim p$ ) are contextually unconstrained and they coincide with uses of IN-NPQs in requiring the speaker to believe or expect that  $p$ .

We then pointed out the striking fact that (1) is just one out of a predicted 117649 [=  $(7 \times 7)^3$ ] different such bias profiles and we went on to discuss constraints that would delimit this curiously large space of options. What we arrived at by extrapolation from a small sample of cases was that a combination of *Static Complementarity* and *Convexity* is the most "effective" approach in that it leaves the considerably reduced number of  $(4 \times 2)^3 = 512$  bias profiles. This is graphically represented in (2) (cf. Gärtner & Gyuris 2017: 304).

(2)		{+}	{-}	{%}	{+,%}	{+,-}	{%,-}	{+,%,-}
PPQ	ev	■				■		■
	ep		■	■	■	■	■	
IN-NPQ	ev	■				■		■
	ep		■	■	■	■	■	
ON-NPQ	ev	■				■		■
	ep		■	■	■	■	■	

Black squares correspond to options ruled out by the constraints. *Convexity* categorically disallows the choice of  $\{+,-\}$ , and (added) *Static Complementarity* limits instantiations of epistemic bias options to just  $\{+\}$  or  $\{+,-,\% \}$ , and confines evidential bias options to the remaining specifications, i.e.,  $\{-\}$ ,  $\{\% \}$ ,  $\{+,\% \}$ , and  $\{\%,-\}$ .

## 2 $ev(IN-NPQ) \Leftrightarrow \{-\}$

In the current brief addendum, we would like to introduce another constraint that is almost perfectly true of our sample: The evidential bias of polar interrogatives expressing IN-NPQs is limited to  $\{-\}$ , as for example in (1b), and, at the same time,  $\{-\}$  only occurs with exactly those forms. We abbreviate this constraint as  $ev(IN-NPQ) \Leftrightarrow \{-\}$  and illustrate it in (3).

(3)		{+}	{-}	{%}	{+,%}	{+,-}	{%,-}	{+,%,-}
PPQ	ev		■					
	ep		■					
IN-NPQ	ev	■		■	■	■	■	■
	ep		■					
ON-NPQ	ev		■					
	ep		■					

All by itself (3) is of average effectiveness, as it cuts options down to  $6^5(\times 1) = 7776$ . However, once we combine (3) and (2), we are getting quite close to a space whose size fits realistic typological coverage. This is shown in (4).

(4)		{+}	{-}	{%}	{+,%}	{+,-}	{%,-}	{+,%,-}
PPQ	ev	■			■	■	■	■
	ep		■					■
IN-NPQ	ev	■		■	■	■	■	■
	ep		■					■
ON-NPQ	ev	■			■	■	■	■
	ep		■					■

Numerically, the result of jointly imposing *Static Complementarity*, *Convexity*, and  $ev(IN-NPQ) \Leftrightarrow \{-\}$  is  $3^2 \times 2^3(\times 1) = 72$ .

The idea that something like  $ev(IN-NPQ) \Leftrightarrow \{-\}$  has to be assumed to account for question bias can build on earlier literature. Thus, both Büring & Gunlogson (2000: 10) and Reese (2007: 90) formulate a counterpart of (“left-to-right”)  $ev(IN-NPQ) \Rightarrow \{-\}$ .

Note finally, that for the one exception to  $ev(IN-NPQ) \Leftrightarrow \{-\}$  arising with Japanese *desho*-Interrogatives, a reanalysis as declaratives plus question tags corresponding to *right?* or *correct?* can independently be plausibilized (cf. Gärtner & Gyuris 2017: 3.1.1).

### 3 Conclusion

In this brief addendum to the paper by Gärtner & Gyuris (2017), we have shown how imposing a bi-uniqueness constraint on the evidential bias of polar interrogatives expressing negative polar questions with inside negation (IN-NPQs) leads to another substantial reduction of the “space” of bias profile. More concretely, combining  $ev(IN-NPQ) \Leftrightarrow \{-\}$  with the previously most “effective”

constraints *Static Complementarity* and *Convexity* leads from 512 to just 72 options predicted. It goes without saying that non-trivial formal, semantico-pragmatic, and typological studies remain to be carried out (cf., for example, Gärtner & Gyuris 2022).

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Budapest

Hans-Martin Gärtner & Beáta Gyuris

Hungarian Research Centre for Linguistics, Benczúr u. 33., 1068 Budapest VI. Hungary.

E-Mail: [hans-martin.gaertner@nytud.hu](mailto:hans-martin.gaertner@nytud.hu), [gyuris.beata@nytud.hu](mailto:gyuris.beata@nytud.hu)