Contextual bias anti-licenses NPIs in polar questions

Overall summary – We present a case of NPI anti-licensing in biased polar questions which has not been discussed in the literature and propose an account in terms of intervention effects. Our account is based on a presuppositional analysis of biased questions and a minimal likelihood analysis of NPI licensing.

A novel observation – Polar questions are known to license NPIs.

(1)　a. #You are reading anything by Chomsky.
　　　b.　Are you reading anything by Chomsky?

What has not been noted, to the best of our knowledge, is that NPI licensing by polar questions is disrupted by evidential bias. Suppose, for example, that B is reading outloud from a book and A hears expressions such as "core syntax", "merge", and "superengineer". A takes this to be evidence that the book's author is Chomsky, and wants to double check. It would be natural for A, in this context, to say (2-i) but not (2-ii).

(2)　Contextual evidence: B is reading Chomsky
　　　A:　(i)　Are you reading something by Chomsky?
　　　　　(ii) #Are you reading anything by Chomsky?

Here's another example. Suppose A is talking to B on the phone and hears what sounds like chewing. A takes this to be evidence that B is eating while talking, and wants to double check. It would be natural for A, in this context, to say (3-i) but not (3-ii).

(3)　Contextual evidence: B is eating
　　　A:　(i)　Are you eating something?
　　　　　(ii) #Are you eating anything?

The generalization, then, is this: a polar question which double checks on ϕ in a context where there is evidence that ϕ does not license NPIs. This paper aims to derive this fact.

Biased questions – We adopt the view on biased questions proposed in Trinh (2014). Thus, we say that English has a covert evidential modal E which is the presuppositional counterpart of von Fintel and Gillies's 2010 epistemic *must*.

(4)　$[\![\text{E } \phi]\!]^c = \begin{cases} [\![\phi]\!]^c & \text{if the evidence in } c \text{ entails } [\![\phi]\!]^c \\ \# & \text{otherwise} \end{cases}$

Polar questions are of the form [WHETHER ϕ] where $[\![\text{WHETHER}]\!]^c(p) = \{p, \neg p\}$. A question presupposes that its answers are defined, which means (5) holds.

(5)　$[\![\text{WHETHER } [\text{E } \phi]]\!]^c = \begin{cases} \{[\![\phi]\!]^c, \neg [\![\phi]\!]^c\} & \text{if the evidence in } c \text{ entails } [\![\phi]\!]^c \\ \# & \text{otherwise} \end{cases}$

A polar question is interpreted as double checking on ϕ if it is understood to presuppose that there is contextual evidence that ϕ, i.e. if it is parsed as [WHETHER [E ϕ]]. We correctly predict that the prejacent of a such a biased question must align semantically with the contextual evidence which causes the bias (Trinh 2014, Northrup 2014, Domaneschi et al. 2017). Suppose, for example, that A sees a ring on B's left hand and takes this to be evidence that B is married. For A to double check on B's marital status, the questions in (6-i) are felicitous while those in (6-ii) are not.

(6)　Contextual evidence: B is married
　　　A:　(i)　Are you married? / Are you not single?
　　　　　(ii) #Are you single? / #Are you not married?

This analysis also accounts for the intuition that negation in polar questions, by default, gives rise to the inference of bias (Romero and Han 2004). The semantics of WHETHER renders negation in a polar question vacuous unless the question is parsed with E:

$[\![\textsc{whether } \phi]\!]^c = [\![\textsc{whether } \neg\phi]\!]^c$ but $[\![\textsc{whether e } \phi]\!]^c \neq [\![\textsc{whether e } \neg\phi]\!]^c$. Since negation makes the sentence more complex, its presence indicates the presence of E, under an appropriate interpretation of the Maxim of Manner (cf. Trinh 2014).

NPI licensing – We adopt the view on NPI licensing proposed in Roelofsen (2018), Roelofsen and Jeong (2022), which builds on Heim (1984), Lee and Horn (1994), Krifka (1995), Lahiri (1998), Crnič (2014, 2019). First, NPIs are existential quantifiers with covert domain restriction and subdomain alternatives. Alternatives of sentences containing NPIs are generated by point-wise composition.

(7) a. $[\![\text{anything}_D]\!]^c = $ something in D
b. $\text{ALT}(\text{anything}_D) = \{\text{anything}_{D'} \mid D' \subset D\}$
c. $\text{ALT}(\text{you eat anything}_D) = \{\text{you eat something in } D' \mid D' \subset D\}$

Second, NPIs associate with a covert operator, EVEN, whose meaning is similar but not identical to that of overt *even*. Specifically, EVEN requires the prejacent be no more likely than any of its alternatives.

(8) $[\![\textsc{even } \phi]\!]^c = \begin{cases} [\![\phi]\!]^c & \text{if no } \psi \in \text{ALT}(\phi) \text{ is such that } \psi <_c \phi \\ \# & \text{otherwise} \end{cases}$

The relation $\psi <_c \phi$ is to be understood in terms of the contextually given probability distribution P^c, where $P^c(p)$ is the likelihood of p in c.

(9) a. If ϕ, ψ are statements, $\psi <_c \phi$ iff $P^c([\![\psi]\!]^c) < P^c([\![\phi]\!]^c)$
b. If ϕ, ψ are questions, $\psi <_c \phi$ iff $P^c(\bigcup[\![\psi]\!]^c) < P^c(\bigcup[\![\phi]\!]^c)$

Given that $P^c(p) \leq P^c(q)$ if $p \subseteq q$, we predict NPIs to be licensed in DE environments in statements. Now consider questions. Let $\phi_D = $ *you eat anything*$_D$ and $\phi_{D'} = $ *you eat anything*$_{D'}$ and let $D' \subset D$, the facts in (10) and (11) follow from (7), (8) and (9).

(10) a. $P^c\big(\bigcup[\![\textsc{whether } \phi_D]\!]^c\big) = P^c\big(\bigcup[\![\textsc{whether } \phi_{D'}]\!]^c\big) = 1$
b. $[\![\textsc{even } [\textsc{whether } \phi_D]]\!]^c = [\![\textsc{whether } \phi_D]\!]^c$
(11) a. $P^c\big(\bigcup[\![\textsc{whether } [\text{e } \phi_{D'}]]\!]^c\big) < P^c\big(\bigcup[\![\textsc{whether } [\text{e } \phi_D]]\!]^c\big)$
b. $[\![\textsc{even } [\textsc{whether } \phi_D]]\!]^c = \#$

The likelihood of any non-biased polar question [WHETHER ϕ] is the likelihood of $(\phi \vee \neg\phi)$, which is 1. The likelihood of an evidentially biased polar question [WHETHER [E ϕ]] is the likelihood that its presupposition is satisfied, i.e. that the evidence in the context entails that ϕ. This likelihood is not 1, and if ϕ has a stronger alternative ϕ^+, [WHETHER [E ϕ]] would be more likely than [WHETHER [E ϕ^+]], and [EVEN [WHETHER [E ϕ]]] would be undefined in case [WHETHER [E ϕ^+]] is in the domain of EVEN. Thus, E intervenes between EVEN and the associated NPI in a manner resembling other presuppositional items such as *too* or *the* (cf. Homer 2008, Gajewski 2011, Ahn 2016).

Rising declaratives – A declarative sentence with rising intonation $[\phi \uparrow]$ can be used as a yes/no question (Gunlogson 2002, Safarova 2005). It is observed that such "declarative questions" do not license NPIs (Hirst 1983, Huddleston 1994, Gunlogson 2002).

(12) a. Is anybody home?
b. #Anybody's home?

We can account for this fact by assuming, as proposed in Trinh (2014), that (i) the evidential marker E is a C head which has a morphological variant E′ with the following properties: (i) E′ has the same semantics as E; (ii) E′ does <u>not</u> trigger T-to-C movement while E does. Analyzing a declarative question $[\phi \uparrow]$ as [WHETHER [E′ ϕ]] would then explain not only its inablility to license NPIs but also its syntactic profile and typical interpretation as presupposing that there is contextual evidence for ϕ.

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