Preposed negation questions with strong NPIs

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1 Introduction

Polar interrogatives (henceforth PQs) can convey various kinds of biases.

- **Preposed negation questions (PNQs):** *positive* speaker epistemic bias (Ladd 1981, Romero and Han 2004, Repp 2013, Sudo 2013, Krifka 2017, Domaneschi et al. 2017, Goodhue 2018); e.g., (1)

- **Questions with strong NPIs (SNPI-Qs):** *negative* speaker epistemic bias, rhetorical flavor (Borkin 1971, Krifka 1995, van Rooy 2003, Guerzoni 2004); e.g., (2); often assumed to share presupposition with *even*-questions like (3)

Strong NPIs include expressions such as *lift a finger* and prosodically stressed *anything.* *ALL CAPS* mark prosodic emphasis and focus.

(1) *Didn’t Mr. Tansley bring something?*  
\[ \sim Sp \text{ believes/ed that Mr. T likely brought something.} \]  

(2) *Did Mr. Tansley bring ANYTHING (at all)?*  
\[ \sim Sp \text{ believes/ed that Mr. T likely did not bring anything.} \]  

(3) *Did Mr. Tansley even show an INKLING of appreciation?*  
\[ \sim Sp \text{ believes/ed that Mr. T likely did not show appreciation.} \]  

Given that the biases signaled by PNQs and SNPI-Qs/ *even*-Qs are apparently contrary, one might expect preposed negation and strong NPIs to *not* be able to co-occur in PQs. However:

- **Preposed negation questions with strong NPIs (SNPI-PNQs):** e.g., (4)

Examples of SNPI-PNQs appear in work as early as Borkin (1971), and are subsequently mentioned in van Rooy (2003) and Asher and Reese (2005). All of these work suggest that SNPI-PNQs convey the same kind of negative bias as SNPI-Qs and do not remark on the potential conflict in biases.

(4) a. *Didn’t Mr. Tansley bring ANYTHING (at all)?*  
\[ \text{SNPI-PNQs} \]  

b. *Didn’t Mr. Tansley (even) lift a finger to help?*  

(5) *Didn’t Mr. Tansley even show an INKLING of appreciation?*  
\[ \text{ *even*-PNQs} \]

The goals of this talk are to address the following questions:

- **Empirical:** What are the nature of biases conveyed by SNPI-PNQs? What are the contextual conditions for felicitous utterances of SNPI-PNQs?
  - Which contexts license simple PNQs, but not SNPI-PNQs?
  - Which contexts license simple SNPI-Qs, but not SNPI-PNQs?

- **Theoretical:** How can we capture the complex layers of biases conveyed by SNPI-PNQs and *even*-type questions? Do the new data provide evidence for or against:
  - Existing theories of PNQs?
  - Existing theories of SNPI-Qs and *even*-type questions?

Since SNPI-PNQs and *even*-PNQs are still quite a mouthful, I will often refer to them as ‘complex questions’ in the talk.

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The main claims in a nutshell:

SNPI-PNQs are in fact associated with complex, dual dimensions of biases, originating from SNPIs on the one hand and preposed negation on the other. Thus, the biases and contextual conditions associated with them do not reduce to ones associated with SNPI-Qs.

(6) Didn’t Mr. Tansley bring ANYTHING (at all)? SNPI-PNQs

\[ \sim \text{Sp} \text{acknowledges that Mr. T did not bring much.} \]

\[ \sim \text{Sp} \text{ previously believed that Mr. T likely brought, or at least, should have brought something.} \]

These biases can be derived compositionally. For this, we need:

- An underspecified semantics for even-type presupposition that does not encode lower likelihood as a part of its meaning (in the vein of Kay (1990) and van Rooy (2003))


2 Empirical observations

SNPI-PNQs are more restricted in their distributions than PNQs and SNPI-Qs. The intuitions outlined below have been corroborated by native speakers as well as by data from a pilot experiment.

- SNPI-PNQs vs. simple PNQs:
  - SNPI-PNQs infelicitous in certain contexts that license simple PNQs e.g., (7b)
  - More generally, SNPI-PNQs infelicitous as out-of-the-blue questions (Asher and Reese 2005)

(7) Context: Cam tells Prue that most of the guests forgot to bring food to the potluck party. Prue thinks that Mr. Tansley probably brought food even if others forgot, as he is the most polite.

a. Didn’t Mr. Tansley bring anything? PNQ

b. #Didn’t Mr. Tansley bring ANYTHING (at all)? SNPI-PNQ

- A first-pass generalizations about felicitous uses of SNPI-PNQs and their biases, based on (7): e.g., \( p = \text{Mr. T brought anything} \)
  - **negative context condition**: SNPI-PNQs (but not PNQs) require that there be mutually available contextual evidence/assumptions that \( \neg p' \), for all \( p' \) that are salient, non-minimal alternatives to \( p \) (van Rooy 2003).
  - **negative epistemic bias**: SNPI-PNQs (but not PNQs) often convey a bias that the speaker currently expects the answer to be negative (bias towards \( \neg p \)).

- SNPI-PNQs vs. simple SNPI-Qs:
  - SNPI-PNQs infelicitous in certain contexts that license simple SNPI-Qs e.g., (8b)
  - SNPI-PNQs convey a kind of positive bias absent in simple SNPI-Qs

Prosodic stress is important – anything without stress would be a weak NPI and the PNQ containing it is felicitous, as shown in (7a).

A follow-up experiment is now underway – please contact me if you are interested in the results!

Depending on the theory, a kind of negative evidential bias is also posited for a subtype of simple PNQs (Büring and Gunlogson 2000, Romero and Han 2004); but the characterization of this bias differs from the contextual conditions for SNPI-PNQs outlined here.
(8) Context: Cam tells Prue that Mr. Tansley forgot to bring his backpack and his binoculars to their yearly expedition. Prue expected this, as she is well accustomed to Mr. Tansley being a huge scatterbrain. But Prue is still curious about whether Mr. Tansley forgot absolutely everything.

a. Did Mr. Tansley bring ANYTHING at all? SNPI-Q
b. #Didn’t Mr. Tansley bring ANYTHING at all? SNPI-PNQ

• This intuition can be further probed by the contrast in felicity of follow-ups such as Of course you don’t, by the same speaker.

(9) a. Do you even know ANYTHING (at all)? Of course you don’t.
b. Don’t you even know ANYTHING (at all)? #Of course you don’t.

• Another intuitive probe: the SNPI-Q (8a) can be used when the speaker and the addressee are jointly venting about Mr. Tansley’s forgetfulness (a flavor of complicity), but not the SNPI-PNQ (8b).

• Additional generalizations about felicitous uses of SNPI-PNQs and their biases, based on (8):
  
  – positive (prior) epistemic bias: SNPI-PNQs (but not SNPI-Qs) convey that the speaker (henceforth Sp) previously thought the answer to her question is, or at least should be, positive (p).
  – Thus, SNPI-PNQs often end up conveying incredulity, indignation, or violation of speaker expectation, unlike simple SNPI-Qs, which only convey negative bias and can be used rhetorically.

3 Pieces that come together

• Given the contrast between simple PNQs and SNPI-PNQs (7), the distinctive negative bias of SNPI-PNQs must come from the strong NPI.

• Given the contrast between simple SNPI-Qs and SNPI-PNQs (8), the distinctive positive bias of SNPI-PNQs must come from the preposed negation (PN).

What we want to derive for SNPI-PNQs:

| Preposed negation → positive (prior) epistemic bias |
| Strong NPI → negative contextual condition/bias |
|**Didn’t Mr. Tansley bring ANYTHING (at all)?**  SNPI-PNQs |
| ~~~ Sp acknowledges that it is contextually established that Mr. T did not bring anything of significance. |
| ~~~ Sp previously believed that Mr. T likely brought, or at least, should have brought something. |

3.1 Analyses of preposed negation questions (PNQs)

In the interest of time, we focus on the following:

(See appendix A.1 for more discussion)

• Deriving the positive speaker epistemic bias from the contribution of preposed negation in SNPI-PNQs
• By adopting Romero and Han (2004)’s analysis

• While also briefly noting that adopting alternative analyses of PNQs will result in essentially the same predictions

Romero and Han (2004)’s analysis, briefly, is as follows:

• Preposed negation contributes a \textit{VERUM} operator in (11)
  \begin{itemize}
  \item $\text{Epi}_x(w)$: sets of worlds that reflect $x$’s epistemic state
  \item $\text{Conv}_x(w)$: sets of worlds that reflect $x$’s conversational goals in $w$.
  \end{itemize}

• FOR-SURE-CG\_\textit{p} translates roughly onto: it is for sure that we should add to the common ground that $p$.

\begin{equation}
\left[\text{VERUM}\right]^{ex/i} = \lambda p \lambda w. \forall w' \in \text{Epi}_x(w)[\forall w'' \in \text{Conv}_x(w')][p \in \text{CG}_{w''}] = \text{FOR-SURE-CG}_x-p
\end{equation}

• IN-PNQs: double-checking the addressee’s implied proposition about $\neg p \rightarrow$ positive epistemic bias ($p$), negative evidential bias ($\neg p$)

\begin{equation}
\text{LF: } [\text{CP} \not X \text{VERUM} [\not [p \text{ Mr. Tansley brought something}] \text{ either}] ]
\end{equation}

• Results in biased partitions; general epistemic and conversational principles, as well as the highlighted radical (the pronounced cell) (which is argued to reflect the speaker’s intent) all come together to derive the observed positive bias.

3.2 Analyses of \textit{even}-type questions with strong NPIs

Shared assumptions & key observations:

• Strong NPIs contribute a kind of covert \textit{even} operator and/or share their presuppositions with \textit{even} (Schmerling 1971, Heim 1984, Krifka 1995, Lahiri 1998)

\begin{equation}
\text{a. Did Mr. Carmichael lift a finger to help?}
\end{equation}

\begin{equation}
\text{b. Did Mr. Carmichael even lift a finger to help?}
\end{equation}

In contrast, most declarative statements with \textit{even} unambiguously signal either hardP or easyP depending, a.o. things, on their polarity.

\begin{equation}
\text{Questions with \textit{even} can be ambiguous between two apparently contrary inferences (Horn 1971): e.g., (14)}
\end{equation}

\begin{equation}
\text{When the focused element denotes the endpoint of a scale, the ambiguity goes away (Guerzoni 2004): e.g., (15)}
\end{equation}

\begin{equation}
\text{When the focused element denotes the lowest endpoint of the scale (e.g., strong NPI), the question obtains a rhetorical flavor: (15b), (15c)}
\end{equation}

\begin{equation}
\text{Can Lily even solve problem 2?}
\end{equation}

\begin{equation}
\text{\rightarrow P2 is the least likely problem that Lily can solve (hardP)}
\end{equation}

\begin{equation}
\text{\rightarrow P2 is the most likely problem that Lily can solve (easyP)}
\end{equation}

The intuitive abbreviations: hardP and easyP have been adopted from Guerzoni (2004).
(15) a. Can Lily even solve the most difficult problem? HIGH endpoint
~ hardP, no bias
b. Can Lily even solve the easiest problem? LOW endpoint
~ easyP, negative bias
c. Did Lily (even) bring ANYTHING (at all)? LOW endpoint
~ easyP, negative bias

• Issues: (i) How to derive the apparently contrary inference: easyP & hardP from a single meaning; (ii) How to predict the negative bias in evenL-Qs (with easyP inference)

The analyses differ as to what the core meaning contribution of (covert) [even] is. Here, we contrast:

• Scopal account
  - [even] directly encodes the hardP (lower likelihood) presupposition
  - When [even] scopes over negation, we get the contrary inference: easyP
    [even](¬p) ~ ¬p is least likely ~ p is most likely

• Informativity based account
  - [even] does not encode the hardP (lower likelihood) presupposition
  - Rather, [even](p) signals greater informativity of p over its alternatives or the settledness of its alternatives

And demonstrate that only the informativity based account can derive the dual dimensions of biases observed in SNPI-PNQs.

4 Analysis


• van Rooy (2003): even-type SNPI-Qs come with a presupposition that the issues concerning all contextually salient alternatives to the SNPI (whether p') have been settled.

• Building on this, we posit an underspecified semantics for even as in (17).

The proposed analysis: SNPIs contribute a silent even operator in (17). Proposed negation contribute a silent VERUM operator in (19).

(16) The semantics of SNPIs:
  a. SNPIs denote minimal endpoints of a scale
  b. SNPIs have a domain-widening effect (Kadmon and Landman 1993)

(17) The semantics of even: the current account
  [even] = λC.λp : ∀q [q ∈ C ∧ q ≠ p → q ∈ CG ∨ ¬q ∈ CG].p
  where C is a set of contextually defined alternative propositions

For the sake of simplicity, we will follow Guerzoni (2004) and henceforth assume that even is a two-place partial function that takes p and returns the same proposition if certain conditions are met. It thus contributes a not-at-issue, presuppositional meaning.
Assuming that PNQs instead involve a high negation (Goodhue 2018; cf. Krifka 2017), our SNPI-PNQ would have the following type of LF:

$$[Q_{pol}] = \lambda p \lambda w \lambda q [q = p \lor q = \neg p]$$

From Hamblin (1971)

$$[\text{VERUM}]^{g/x/i} = \lambda p \lambda w : \forall w' \in \text{Epi}_s(w) \forall w'' \in \text{Conv}_s(w') [p \in \text{CG}_{w''}]$$

From Romero and Han (2004)

Recall that we want to capture the intuitions in (20) using (21) and (22).

### Preposed negation $\implies$ positive (prior) epistemic bias

**Strong NPI $\implies$ negative contextual condition/bias**

(20)  
*Didn’t Mr. Tansley bring ANYTHING (at all)?*  

SNPI-PNQs

$\sim \sim Sp$ acknowledges that it is contextually established that Mr. T did not bring anything of significance.

$\sim \sim Sp$ previously believed that Mr. T likely brought, or at least, should have brought something.

(21)  
$$[\text{even}] = \lambda C. \lambda p : \forall q [q \in C \land q \neq p \implies q \in \text{CG} \lor \neg q \in \text{CG}]. p$$

where C is a set of contextually defined alternative propositions

(22)  
$$[\text{VERUM}]^{g/x/i} = \lambda p \lambda w : \forall w' \in \text{Epi}_s(w) \forall w'' \in \text{Conv}_s(w') [p \in \text{CG}_{w''}]$$

Let us first assume that the SNPI-PNQs involve an inner negation (as IN-NPQs):

(23)  
*Did Mr. Tansley (even) bring ANYTHING at all?*

$$[Q_{pol} \mid \text{VERUM} [\text{even} \neg \sim [\text{Mr. Tansley brought ANYTHING at all (=} p)]]]]$$

$$= \{\neg \text{FOR-SURE-}\text{CG}-\text{even}(-p), \sim \text{FOR-SURE-}\text{CG}-\text{even}(-p)\}$$

- **Negative bias**: epistemic bias towards $\neg p$, contextually established that $\neg p'$
  - From (21), it follows that all issues involving alternatives to $\neg p$, namely, whether $\neg p'$, have been settled
  - If whether $\neg p'$ were settled to $p'$, then whether $\neg p$ would not be questionable
  - Therefore, all whether $p'$ issues have been settled to $\neg p'$
    (See van Roooy (2003) for a same kind of reasoning for simple SNPI-Qs)
  - The speaker additionally had to actively widen the domain (qua SNPI)

- **Positive bias**: prior epistemic bias towards $p$
  - Just as in simple (IN-)NPQs, the question ends up conveying: Should we really add $\neg p$ to the CG?

- In sum, by uttering SNPI-NPQs, the speaker presumes $\neg p'$ for all $p'$, thereby conveying bias towards $\neg p$ as well, while also making the meta-conversational move of requesting further justification for adding $\neg p$ to the CG, thereby signifying attitudes in the vein of incredulity or indignation about $\neg p$.

As mentioned before, the predictive power of the analysis does not hinge critically on which type of analysis we adopt for PNQs. Assuming that PNQs instead involve a high negation (Goodhue 2018; cf. Krifka 2017), our SNPI-PNQ would have the following type of LF:

(24)  
$$[Q_{pol} \neg \square [even \text{ Mr. Tansley brought ANYTHING at all (=} p)]]]]$$

$$= \{\neg \square [\text{even}](p), \square [\text{even}](p)\}$$

The analysis of PNQ adopted in (24) follows that of Goodhue (2018), which is based on Krifka (2017). The latter posits an ASSERT operator that are functionally analogous to $\square$. Substituting $\square$ with VERUM in (24) gives us Romero and Han (2004)’s analysis of ON-PNQs.
• **Negative bias**: epistemic bias towards \( \neg p \), contextually established that \( \neg p' \)
  - Again, from (17), it follows that issues involving all non-minimal alternatives to \( p \), namely, \( \text{whether } p' \), have been settled
  - If \( \text{whether } p' \) were settled to \( p' \), then \( \text{whether } p \) would not be questionable; thus, all \( \text{whether } p' \) issues have been settled to \( \neg p' \)

• **Positive bias**: prior epistemic bias towards \( p \)
  - Following Romero and Han (2004)’s analysis, (24) would end up conveying: Should we not for sure add \( p \) to the CG? (same as in simple ON-NPQs)
  - Following Goodhue (2018)’s analysis, the resulting answer cells in (24) would end up conveying positive epistemic bias

• In sum, by uttering SNPI-NPQs, the speaker presumes \( \neg p' \) for all \( p' \), thereby conveying bias towards \( \neg p \) as well, while also creating answer partitions that ends up signaling her prior epistemic bias towards \( p \).

The analysis can easily extend to \( \text{even}_{L} \)-PNQs as well, as long as it is contextually supplied that the focused element of \( \text{even}_{L} \)-PNQs denotes a low endpoint of a scale.

**Section summary**: Adopting an informativity-based account of \( \text{even} \)-type presuppositions in SNPIs enables us to derive the dual biases of SNPI-PNQs and \( \text{even}_{L} \)-PNQs.

### 5 Can a scopal account derive the biases of SNPI-PNQs?

#### 5.1 A scopal account of \( \text{even} \)


• The entry for \([\text{even}]\) that incorporates the hardP (lower likelihood) presupposition, as in (25).

(25) **The semantics of \( \text{even} \): the scopal account**

\[
[\text{even}] = \lambda C. \lambda p : \forall q ( q \in C \land q \neq p \rightarrow q >_{\text{likely}} p ) \cdot p
\]

where \( C \) is a set of contextually defined alternative propositions

- When \([\text{even}]\) scopes over negation, we get the contrary inference: easyP, as exemplified in (26).

(26) Lily Briscoe didn’t even pick up her paint brush. \( \rightarrow [\text{even}] (\neg p) \)
  a. Not picking up the paintbrush (\( \neg p \)) is the least likely thing for L to do
  b. Picking up the paintbrush (\( p \)) is the most likely thing for L to do

• Extension of the account to \( \text{even} \)-type SNPI-Qs by Guerzoni (2004)
  - A covert \( \text{whether} \) operator in (27) (roughly: whether yes or no)
  - Trace of whether (\( t_1 \)) may scope over or below \( \text{even} \)


In addition to a scalar presupposition along the line of (25), Karttunen and Peters (1979) also posit an existential presupposition which we will not concern ourselves with here.
– When it scopes below even, the answer cells in the resulting question denotation come to have different presuppositions

\[ \llbracket \text{even}(p) \rrbracket \rightarrow \text{hardP} \quad \llbracket \text{even}(\neg p) \rrbracket \rightarrow \text{easyP} \]

– When the focused element denotes the lowest endpoint (e.g., SNPI), only the negative answer in LFs such as (29b) and (30) satisfies the presupposition contributed by the element (easyP)

\[ J \rho J = \{ p : \exists h(p) \}
\]

\[
\llbracket \text{whether} \rrbracket = J f(J,(a,b)) \llbracket \exists h(p) \rrbracket \]

\[
\llbracket \text{Q} \rrbracket = \lambda p \lambda q \lambda r \llbracket p = q \rrbracket
\]

\[ J \rho J = \{ p : \exists h(p) \rrbracket \}
\]

(29) Did Mr. Tansley even bring food?

a. \[ \text{[Whether} \llbracket Q \llbracket t_1(a,b) \rrbracket \text{even} \text{Mr. Tansley brought FOOD (}=p\text{) }\rrbracket ] \]

\[ = \{ \llbracket \text{even}(p) \rrbracket , \llbracket \neg \text{even}(p) \rrbracket \} \quad \text{when FOOD: high end} \]

b. \[ \text{[Whether} \llbracket Q \llbracket t_1(a,b) \rrbracket \text{even} \text{Mr. Tansley brought FOOD (}=p\text{) }\rrbracket ] \]

\[ = \{ \llbracket \text{even}(\neg q) \rrbracket , \llbracket \text{even}(\neg p) \rrbracket \} \quad \text{when FOOD: low end} \]

(30) Did Mr. Tansley bring ANYTHING at all?

\[ [ \text{Whether} \llbracket Q \llbracket t_1(a,b) \rrbracket \text{even} \text{Mr. Tansley brought anything (}=p\text{) }\rrbracket ] \]

\[ = \{ \llbracket \text{even}(\neg q) \rrbracket , \llbracket \text{even}(\neg p) \rrbracket \} \quad \text{ANYTHING: necessarily low end} \]

– SNPI-Qs: a special case of even-Qs where only the negative answer \( \llbracket \text{even}(\neg p) \rrbracket \) is effectively entertained by the speaker, given the contextual presuppositions

– Also predicts why questions such as (29a) and (15) do not convey bias: in this case, both answers satisfy the presupposition

5.2 Deriving the dual biases from the scopal account

As it stands, a scopal account cannot predict the dual biases of SNPI-PNQs.

– Logically possible orderings of four operators: 4! = 24

\[ \text{VERUM, } \neg, \llbracket \text{even} \rrbracket, t_1 \text{ of whether} \]

– VERUM expected to scope over even

– If we maintain the ON-PNQ vs. IN-PNQ distinction, negation expected to scope below VERUM for SNPI-PNQs

– No matter which ordering we adopt, we can only derive a uni-dimensional bias from a given LF

– When \( \llbracket \text{even} \rrbracket \) scopes below trace of whether: e.g., \( t_1 > \text{VERUM} > \llbracket \text{even} \rrbracket > \neg \)

Only positive bias predicted! (see (31))

– Both Yes/No answers effectively entertained by the speaker (as both cells satisfy the easyP presupposition)

– Double-checking with the addressee whether \( \neg p \) should really be added to the CG \( \rightarrow \) positive epistemic bias

\[ [\text{whether} \llbracket Q \llbracket t_1 \llbracket \text{VERUM} \text{even} \text{Mr. T brought anything (}=p\text{)} \rrbracket ] \rrbracket ] \]

\[ = \{ \llbracket \text{FOR-SURE-CG-even}(\neg q) \rrbracket , \llbracket \text{VERUM-CG-even}(\neg p) \rrbracket \} \]

– When \( \llbracket \text{even} \rrbracket \) scopes above trace of whether: \( t_1 > \text{VERUM} > \llbracket \text{even} \rrbracket > \neg \)

Only negative bias predicted! (see (32))
– Only the ‘No’ answer effectively entertained by the speaker (as this is the only cell that satisfies the easyP presupposition)
– The question thus ends up conveying: We should really add \( \neg p \) to the CG

\[
(32) \quad \left[ \text{Whether} | \left[ Q \left[ \text{VERUM} \left[ \text{even} | t_1 \left[ \text{not} [\text{Mr. brought anything (= } p )] \right] \right] \right] \right] \right]
\]
\[
= \{ \text{FOR-SURE-CG-} \text{[even]}(\neg p), \text{FOR-SURE-} \text{CG-}[\text{even}](p) \}
\]

The latter answer cell is derived from \( \text{VERUM} \text{[even]}(\neg p) \).

Can alternative analyses of PNQs help derive the right predictions for a scopal account of SNPI-PNQs?: e.g., a high negation analysis (Krifka 2015, Goodhue 2018)

- All of these analyses posit a high negation that scopes over some kind of speech act operator
- \( \text{VERUM} \) (Romero and Han 2004), \( \text{ASSERT} \) (Krifka 2017), \( \Box \) (Goodhue 2018)
- When [\text{even}] scopes below trace of \text{whether}:
  \( \neg \Box > \Box > [\text{even}] > t_1 \)
  No answers satisfy the contextual presupposition! (see (33))

\[
(33) \quad \left[ \text{whether} | \left[ Q \left[ \neg \Box | t_1 \left[ \text{[even]} \left[ \text{Mr. T brought anything (= } p )\right] \right] \right] \right] \right]
\]
\[
= \{ \neg \Box \text{[even]}(p), \neg \Box \text{[even]}(p) \}
\]

- When [\text{even}] scopes above trace of \text{whether}:
  \( \neg \Box > \Box > [\text{even}] > t_1 \)
  Only positive bias predicted! (see (34))

  - Only the \( \neg \Box \text{[even]}(\neg p) \) entertained by the speaker (as this is the only cell that satisfies the easyP presupposition)
  - The question thus ends up conveying: not necessarily \( \neg p \)

\[
(34) \quad \left[ \text{whether} | \left[ Q \left[ \neg \Box | t_1 \left[ \text{[even]} \left[ \text{Mr. T brought anything (= } p )\right] \right] \right] \right] \right]
\]
\[
= \{ \neg \Box \text{[even]}(p), \neg \Box \text{[even]}(\neg p) \}
\]

Section summary: If one adopts a scopal account of even-type presuppositions in even-Qs and SNPI-Qs, the co-existence of two types of biases in SNPI-PNQs and even\(_L\)-PNQs cannot be predicted from any given LF.

6 Discussion & Remaining questions

6.1 An alternative informativity-based account?

Kay (1990)’s intuition about ‘informativity’ concerning the distribution of even can be captured by Chierchia’s \( E_C \), which is based on Krifka (1995) and Lahiri (1998).

\[
(35) \quad \text{Adaptation of Chierchia (2006)’s } E_C \text{ to } [\text{even}]:
\]
\[
[\text{even}] = \lambda C. \lambda p : \forall q [q \in C \land q \neq p \to p \subseteq_c q]. p
\]

where \( \subseteq_c \) stands for: contextually entails

No need to rely on scopal interactions to derive both easyP & hardP:

\[
(36) \quad \text{Given a context with the following salient scale:}
\]
\[
\{ \text{English} \} \{ \text{English, French} \} \{ \text{English, French, Latin} \}
\]
\[
a. \quad L \subseteq_c F \subseteq_c E
\]
\[
b. \quad \neg E \subseteq_c \neg F \subseteq_c \neg L
\]
(37)  a. Mr. Carmichael can even read Latin.
    b. #Mr. Carmichael can even read English.

(38)  a. #Mr. Carmichael can’t even read Latin.
    b. Mr. Carmichael can’t even read English.

The entry in (35) incorporates strength and can derive both easyP and hardP without having to rely on scopal ordering. However, it cannot derive the negative bias of SNPI-Qs and evenL-Qs by itself. We would thus still want settledness to play a role, in addition to strength, as in (39).

(39)  An alternative account of \([\text{even}]\):

\[
[\text{even}] = \lambda C.\lambda p : \forall q \{ q \in C \land q \neq p \rightarrow p \subseteq_c q \land (q \in CG \lor \neg q \in CG) \}, p
\]

Q: (39) is less underspecified than (17). Do we want this?
A: The answer depends on what theory we would like to posit for PNQs.

- If we posit a high negation account of PNQs (Krifka 2015, Goodhue 2018), then (39) would give us a wrong presupposition:
  - \{\neg \Box [\text{even}](p), \Box [\text{even}](p)\}
    where e.g., \( p = \) Mr. Tansley brought anything
  - \( p \subseteq_c q \)

- Positing (35) for even therefore necessitates a low-negation account, i.e., the IN-PNQ account (Romero and Han 2004, Krifka 2017) of PNQs

- The analysis in (17) is compatible with both types of analyses of PNQs.

What we want is \( \neg p \subseteq_c \neg q \) or \( q \subseteq_c p \).

Alternatively, one may also claim that negation scopes high, but even scopes even higher. This may be a problematic assumption to maintain for overt even-questions.

Adopting an account of even that directly encodes strength will likely necessitate a low negation account of PNQs. If we want a high negation account of PNQs, we need the current (more underspecified) account of even.

6.2 Can the present analysis of even be extended to all cases of even?

Ideally, we would like a unified account of even in:

- Interrogatives with SNPIs (implicit or explicit even)
- Interrogatives with explicit even
- Declaratives with even

Broadly speaking, informativity-based account of even does a better job of explaining why statements with negation and even not only can, but also have to have the easyP presupposition.

However, the specific implementation in (17) may not be easily generalizeable to declaratives with even statements.

- The correct interpretations were derived due to the ‘endpoint’ meaning contributed independently by SNPIs.
- We may need something like (39) after all, in order to capture the meaning contribution of even in declaratives.
• Alternatively, we may posit that the endpoint assumption concerning the focused element is contextually provided.

6.3 Conclusion

• SNPI-PNQs are a genuine hybrid of SNPI-Qs and PNQs that ends up signaling multi-faceted biases.
• Deriving the dual biases calls for an underspecified entry for even, and a non-scopal account of its presupposition.
• The analysis provides yet another instance where question biases emerge primarily from informativity related considerations and pragmatic reasoning, rather than being lexically encoded or compositionally enforced.
• To extend the **settledness**-based account of even beyond SNPI-Qs, the endpoint or **strength**-based assumption may have to be added or contextually provided.

References


Chierchia, G. (2006). Broaden your views: Implicatures of domain widening and the “logi-


A Appendix

A.1 Key issues concerning preposed negation questions

• Is there an ambiguity between ON-PNQs (outer negation) and IN-PNQs (inner negation)?
  – No: all PNQs involve a high negation (Goodhue 2018); expressions like (40b) are not entirely acceptable (Sailor 2013)

The original abbrevs in Ladd (1981) are ON-NPQ & IN-NPQ.
What types of biases are conveyed by PNQs?
- Only positive speaker epistemic bias (Goodhue 2018)
- Both positive speaker epistemic bias, and negative evidential bias for IN-PNQs (Romero and Han 2004, Sudo 2013)

How can these biases be derived?
- The interaction of VERUM operator and negation, resulting in different answer partitions from simple PQs (Romero and Han 2004; cf. Krifka 2017)
- High negation scoping over a speech act operator (ASSERT or □), resulting in different answer partitions from simple PQs (Krifka 2015, Goodhue 2018)

A.2 The ON vs. IN-PNQ distinction in PNQs
First observed by Ladd (1981); analyzed by Romero and Han (2004).

- ON-PNQs: double-checking the speaker’s original belief about \( p \)
  \( \rightarrow \) positive epistemic bias (\( p \))

\( \begin{align*}
\text{(41) Didn’t Mr. Tansley bring something (too)?} \\
\text{a. LF: } [CP Q_1 \text{VERUM } [p \text{ Mr. Tansley brought something (too) }]] \\
\text{b. } [CP](w_0) = \{ \text{It is not for sure that we should add to CG that Jane is coming. It } \\
\text{is for sure that we should add to CG that Jane is coming} \}
\end{align*} \)

- IN-PNQs: double-checking the addressee’s implied proposition about \( \neg p \)
  \( \rightarrow \) positive epistemic bias (\( p \)), negative evidential bias (\( \neg p \))

\( \begin{align*}
\text{(42) Didn’t Mr. Tansley bring something (either)?} \\
\text{a. LF: } [CP Q_1 \text{VERUM } [\text{not } [p \text{ Mr. Tansley brought something }\text{ either }]]] \\
\text{b. } [CP](w_0) = \{ \text{It is for sure that we should add to CG that Mr. Tansley did not } \\
\text{bring something. It is for sure that we should add to CG that Mr. Tansley } \\
\text{did not bring something} \}
\end{align*} \)

A.3 Comparison of informativity-based account of even

- Kay (1990)’s analysis of even:
  - Even indicates that the sentence or clause in which it occurs expresses, in context, a proposition which is more informative (‘stronger’) than some particular distinct proposition taken to be already present in the context
    * Text proposition (tp) & context proposition (cp)
    * Informativeness as a relation holding between two propositions tp & cp, relative to a scalar model SM

- van Rooy (2003)’s analysis of even-type SNPI-Qs:
  - Based on Kay (1990), Kadmon and Landman (1993), and Krifka (1995)
  - even-type SNPI-Qs come with a presupposition that the issues concerning all contextually salient alternatives to the SNPI (whether \( p’ \)) have been settled
    * Not specified if whether \( p’ \) is settled to \( p’ \) or \( \neg p’ \)
    * SNPIs additionally have a domain-widening effect (Kadmon and Landman 1993)

- Also relevant is Krifka (1995) and Lahiri (1998)’s treatment of strong NPIs, as well as Chierchia (2006)’s enrichment operator: \( E_C \)
  - Roughly:
    \[
    [\text{even}] = \lambda C. \lambda p : \forall q [q \in C \land q \neq p \rightarrow p \subseteq_c q]. p
    \]
  - Discussed in sec. 6.1.
A.4 Derivation of SNPI-PNQs under a scopal account

Recall that:

(43) \[[\text{whether}] = \lambda f_{(st,st)} \cdot \{ p : \exists h_{(s,t)} [(h = \lambda p.p \lor h = \lambda p.\neg p) \land p \in f(h)] \}\]

(44) \[[Q] = \lambda q.\lambda p.\{p = q\}\]

The examples (31) and (32) in the main text, repeated in (45) and (46), have the following derivations:

(45) \[[\text{whether}_1 \{Q \{t_1 [\text{VERUM} \{\text{even} \\neg \text{Mr. T brought anything (=p)}]\}\}\} = \{\{\text{FOR-SURE-CG-}[\text{even}](\neg p)\}, \neg \text{FOR-SURE-CG-}[\text{even}](\neg p)\}\]

\begin{center}
\begin{tikzpicture}
\begin{node}[draw, shape=rectangle, anchor=north east, inner sep=0pt, outer sep=0pt, text width=10cm, text height=10cm, text depth=1cm]{\[Q_{(st,(st,st))}\] \(\{t_1\}^{\text{VERUM}}(\text{even}(\neg p))\)}
\end{node}
\node[draw, shape=rectangle, anchor=north east, inner sep=0pt, outer sep=0pt, text width=10cm, text height=10cm, text depth=1cm] at (0,0) {\(Q_{(st,(st,st))}\) \(\{t_1\}^{\text{VERUM}}(\text{even}(\neg p))\)};
\node[draw, shape=rectangle, anchor=north east, inner sep=0pt, outer sep=0pt, text width=10cm, text height=10cm, text depth=1cm] at (2,2) {\text{VERUM} \text{ even}(\neg p)};
\node[draw, shape=rectangle, anchor=north east, inner sep=0pt, outer sep=0pt, text width=10cm, text height=10cm, text depth=1cm] at (4,4) {\text{even} \neg p};
\node[draw, shape=rectangle, anchor=north east, inner sep=0pt, outer sep=0pt, text width=10cm, text height=10cm, text depth=1cm] at (6,6) {\neg p};
\end{tikzpicture}
\end{center}

(46) \[[\text{whether}_1 \{Q \{t_1 [\text{VERUM} \{\text{even} \{t_1 [\text{not [ Mr. brought anything (=p)]}\}]\}\} = \{\{\text{FOR-SURE-CG-}[\text{even}](\neg p)\}, \text{FOR-SURE-CG-}[\text{even}](\neg p)\}\]

\begin{center}
\begin{tikzpicture}
\begin{node}[draw, shape=rectangle, anchor=north east, inner sep=0pt, outer sep=0pt, text width=10cm, text height=10cm, text depth=1cm]{\[Q_{(st,(st,st))}\] \(\{t_1\}^{\text{VERUM}}(\text{even}(\neg p))\)}
\end{node}
\node[draw, shape=rectangle, anchor=north east, inner sep=0pt, outer sep=0pt, text width=10cm, text height=10cm, text depth=1cm] at (0,0) {\[Q_{(st,(st,st))}\] \(\{t_1\}^{\text{VERUM}}(\text{even}(\neg p))\)};
\node[draw, shape=rectangle, anchor=north east, inner sep=0pt, outer sep=0pt, text width=10cm, text height=10cm, text depth=1cm] at (2,2) {\text{VERUM} \text{ even}(g(1)(\neg p))};
\node[draw, shape=rectangle, anchor=north east, inner sep=0pt, outer sep=0pt, text width=10cm, text height=10cm, text depth=1cm] at (4,4) {\text{even} \neg p};
\node[draw, shape=rectangle, anchor=north east, inner sep=0pt, outer sep=0pt, text width=10cm, text height=10cm, text depth=1cm] at (6,6) {\neg p};
\end{tikzpicture}
\end{center}