

# Biased *Yes/No* Questions, *really*, and Answers

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## ABSTRACT

Questions with *really* like *Did Jorge really bring a present?*, questions with preposed negation like *Doesn't John drink?*, and, in certain contexts, plain questions like *Is it raining outside?* convey an epistemic bias of the speaker. This paper examines two recent approaches to this bias: the VERUM-approach and the Decision Theory approach. It will be argued that: (i) while Decision Theory provides an adequate formalization of the notion of “intent”, the operator VERUM is needed to derive the data; and (ii) that the discourse particle *really* denoting VERUM sometimes contributes to the expressive content rather than to the propositional content of the sentence, deriving the pattern of *yes/no*-answers.

## 1 Introduction

Two main kinds of epistemic bias in *yes/no* (*yn*)-questions have been discussed in the recent literature. On the one hand, a positive *yn*-question with epistemic *really* necessarily conveys that the speaker S originally believed the correct answer to be in the negative. E.g., (1S) without *really* is acceptable in unbiased scenarios, but (1S') with *really* is not (Romero&Han 2004). Similarly, a *yn*-question with preposed negation like (2S') necessarily conveys S's bias that the correct answer is in the affirmative (Ladd 1981, Gunlogson&Büring 2000). E.g. (2S) with non-preposed negation is acceptable in unbiased scenarios, but (2S') still carries a bias (Han 1999, Romero&Han 2004). This first type of bias has opposite polarities in the question and in the propositional content of the bias.

- (1) A: Jorge just visited Birgit and Jorn's newborn boy.  
S: Did he bring a present for him?  
S': # Did he really bring a present for him? (Negative bias *He didn't bring a present*)
- (2) Scenario: The speaker is organizing a party and she is in charge of supplying all the non-alcoholic beverages for teetotalers. The speaker is going through a list of people that are invited. She has no previous belief or expectation about their drinking habits.  
A: Jane and Mary do not drink.  
S: OK. What about John? Does he not drink (either)?  
S': # OK. What about John? Doesn't he drink (either)? (Positive bias *John drinks*)

On the other hand, Gunlogson&Büring (2000) discuss a second type of bias where the polarities of the question and of the bias are the same. E.g. in (3), contextual evidence bias for *p* prompts S to ask *p?* (3S) rather than  $\neg p?$  or a similar alternative (3S').

- (3) Scenario: Addressee enters Speaker's windowless computer room wearing a dripping wet raincoat.

- S: What's the weather like out there? Is it raining? (Cont. evidence bias for *It is raining*)  
 S': # What's the weather like out there? Is it sunny? (Cont. evidence bias for *It is sunny*)

The bias in (1)-(2) is analyzed in Romero&Han (2002) and Romero&Han (2004) using the operator VERUM and the informal notion of “intent” of a question. The bias in (2)-(3) is analyzed by Nilsenova&Rooy (2003) and by Rooy&Safarova (2003) using Decision Theory. The present paper has two goals. The main goal is to compare these two approaches and argue contra Rooy&Safarova (2003) that, while Decision Theory provides an adequate formalization of “intent”, VERUM is still needed to derive the full array of data. The second goal is to examine the discourse behaviour of the epistemic particle *really* and to explain, within the VERUM approach, the pattern of *yes* and *no* responses to a preposed negation question, as in (4). It will be argued that, in certain environments, VERUM contributes to the so-called expressive meaning rather than to the regular truth conditions.

- (4) Q: Didn't Mary visit Sue?    A: Yes, she did.    A': No, she didn't.

The paper is organized as follows. Section 2 presents each of the two approaches. Section 3, addressing the first goal, argues that VERUM is needed to derive the relevant empirical patterns. Section 4, devoted to the second goal, explores the behavior of *really* / VERUM further and explains the answer pattern. Section 5 concludes.

## 2 The Two Approaches

### 2.1 The VERUM-Approach

The keystone of the VERUM-approach is the operator defined in (5), where  $Conv_x(w')$  is the set  $\{w'' : \text{the conversational goals of } x \text{ in } w' \text{ are met in } w''\}$  and CG is the Common Ground. The VERUM operator is introduced by the particle *really* in (1S') and, by hypothesis, by the preposing of negation in (2S'). Note that (5) corresponds to epistemic *really*, as in (6b), which is different from the intensifier *really* in (6a). Also, as noted in Romero&Han, *really*/VERUM is not a run-off-the-mill epistemic operator, witness the contrast in (7). Rather, VERUM *p* insists that *p* be accepted into the CG, and it can be roughly paraphrased as “it is for sure that we should add *p* to CG”.<sup>1</sup>

$$(5) \quad \llbracket \text{VERUM}_i \rrbracket^{gx/i} = \llbracket \text{really}_i \rrbracket^{gx/i} = \lambda p_{\langle s, t \rangle} \lambda w. \forall w' \in \text{Epi}_x(w) [\forall w'' \in \text{Conv}_x(w') [p \in \text{CG}_{w''}]] \\ = \text{FOR-SURE-CG}_x$$

- (6) a. Sandra is really clever.     $\implies$     Intensifier *really*  
 b. Sandra really is clever.     $\implies$     VERUM-*really*

- (7) a. ? I am sure I am tired.  
 b. I really am tired.

VERUM derives the following data.

First, using the lexical entry for the *Q*-morpheme in (8), regular *yn*-interrogatives like (1S)-(2S) introduce a balanced partition of shape  $\{p, \neg p\}$ , as illustrated in (9) (see Groenendijk&Stokhof (1985) on partitions). In contrast, a *yn*-interrogative with VERUM produces an unbalanced partition

<sup>1</sup>Romero&Han's (2004) notion of VERUM stems from the so-called Verum Focus in Höhle (1992).

of shape  $\{ \text{VERUM } p, \neg \text{VERUM } p \}$ , as in (10). This unbalanced partition questions the validity of adding  $p$  to CG. By conversational economy, this is allowed only when there are reasons to question such addition, e.g., when an epistemic conflict would arise from such addition. This derives the existence of a previous epistemic bias for (1S')-(2S').

$$(8) \quad \llbracket Q \rrbracket = \lambda p_{\langle s,t \rangle} \lambda w_s \lambda q_{\langle s,t \rangle} [q = p \vee q = \neg p]$$

(9) a. Did Jorge bring a present?

b. LF:  $[_{CP} Q [_{\text{Jorge brought a present}} ] ]$

$$\begin{aligned} \text{c. } \llbracket Q \text{ Jorge brought a present} \rrbracket(w_0) \\ &= \lambda q [q = \lambda w. \text{Jorge brought a present in } w \vee \\ &\quad q = \lambda w. \neg(\text{Jorge brought a present in } w)] \\ &= \{ \text{“Jorge brought a present”, “Jorge did not bring a present”} \} \end{aligned}$$

(10) a. Did Jorge really bring a present?

b. LF:  $[_{CP} Q [_{\text{VERUM}} [_{\text{Jorge brought a present}} ] ] ]$

$$\begin{aligned} \text{c. } \llbracket Q \text{ VERUM Jorge brought a present} \rrbracket(w_0) \\ &= \lambda q [q = \text{FOR-SURE-CG} (\lambda w. \text{Jorge brought a present in } w) \vee \\ &\quad q = \neg \text{FOR-SURE-CG} (\lambda w. \text{Jorge brought a present in } w) ] \\ &= \{ \text{“it is for sure that we should add to CG that Jorge brought a present”,} \\ &\quad \text{“it is not sure that we should add to CG that Jorge brought a present”} \} \end{aligned}$$

Second, Ladd (1981) noted that a preposed negation *yn*-question like *Isn't Jane coming?* – which invariably conveys an original bias towards  $p$  (=‘Jane is coming’)– may be used to double-check  $p$ , as in the dialog in (11), or to double-check  $\neg p$ , as in (12). The VERUM-approach derives Ladd’s intuitive readings as a case scope ambiguity between VERUM and negation. In the  $p$ -reading (11) double-checking  $p$ , *not* scopes over VERUM, as shown in (13). In the  $\neg p$ -reading (12) double-checking  $\neg p$ , VERUM scopes over *not*, as in (14). This is summarized in the schema (15). Note that both LFs give rise to unbalanced partitions, hence deriving the existence of a bias. But in the first case the proposition in the scope of FOR-SURE-CG is  $p$ , and in the second case it is  $\neg p$ , thus deriving Ladd’s intuitive ambiguity.

(11) A: Ok, now that Stephan has come, we are all here. Let’s go!

S: Isn’t Jane coming **too**? (reading double-checking  $p$ )

(12) Scenario: Pat and Jane are two phonologists who are supposed to be speaking in our workshop on optimality and acquisition.

A: Pat is not coming. So we don’t have any phonologists in the program.

S: Isn’t Jane coming **either**? (reading double-checking  $\neg p$ )

(13) Isn’t Jane coming too?

LF:  $[_{CP} Q \text{not} [_{\text{VERUM}} [_{IP} \text{Jane is coming too} ] ] ]$

$$\begin{aligned} \llbracket \cdot \rrbracket(w_0) = \lambda q [q = \text{FOR-SURE-CG} (\lambda w. \text{Jane is coming in } w) \vee \\ q = \neg \text{FOR-SURE-CG} (\lambda w. \text{Jane is coming in } w) ] \end{aligned}$$

(14) Isn't Jane coming either?

LF: [<sub>CP</sub> *Q* VERUM [ not [<sub>IP</sub> Jane is coming] either ] ]

$[[\cdot]](w_o) = \lambda q [ q = \text{FOR-SURE-CG} (\lambda w. \neg(\text{Jane is coming in } w)) \vee$   
 $q = \neg\text{FOR-SURE-CG} (\lambda w. \neg(\text{Jane is coming in } w)) ]$

(15) Schema:

[Not [VERUM <i>p</i> ] ]	$\implies$	<i>p</i> -reading (11).
[VERUM [not <i>p</i> ] ]	$\implies$	$\neg$ <i>p</i> -reading (12).

## 2.2 The Decision Theory Approach

Central to the Decision Theory approach is the utility value (UV) of a proposition *p*:

(16) A proposition *p* has a high utility value if:

- i. its becoming true brings the speaker closer to her goal, or
- ii. its addition to the speaker's epistemic state would trigger a wide revision of it.

A *yn*-question *r*? (where *r* can have a positive form *p* or a negative form  $\neg$ *p*) is an instruction to partition the CG in two cells: the cell *r* and the cell  $\neg$ *r*. Which one of the two cells is pronounced is important:

(17) Out of a question partition, the speaker pronounces the cell whose utility value is higher. Both cells have equal utility values in *r or not*?

With utility values and without VERUM, this approach accounts for the following data.

First, it accounts for Bolinger's (1978) extended paradigm using case (i) of UV. A request for *p* can only be posited by asking *p*?, and not by asking its alternative question version *p or*  $\neg$ *p*? (Bolinger 1978), nor by asking its negative question version  $\neg$ *p*?, as illustrated in (18). This is because *p* becoming true, but not  $\neg$ *p* becoming true, would bring the speaker closer to her goal (UV, case (i)).

(18) Request for help:

- a. Will you help me?    b. # Will you help me or not?    c. # Will you not help me?

Second, Ladd's readings double-checking *p* and  $\neg$ *p* depend on the epistemic state at which the UV (case (ii)) is checked. For the reading double-checking *p* in (11), the UV is computed wrt S's current epistemic state: S had an original bias towards *p* and S retains this bias after A's utterance, making the utility of learning  $\neg$ *p* high at the current state. For the reading double-checking  $\neg$ *p* in (12), the UV corresponds to a previous epistemic state: S was originally biased towards *p*, and thus the UV of  $\neg$ *p* was high at this original state, even though after A's utterance S may not be so confident about her original bias. This is summarized in (19).

(19) Schema:

Utility of $\neg$ <i>p</i> at CURRENT state	$\implies$	Current- <i>p</i> -bias reading (11).
Utility of $\neg$ <i>p</i> at PREVIOUS state	$\implies$	Previous- <i>p</i> -bias reading (12).

### 3 Comparison between the two approaches: VERUM is needed

With UV and without VERUM, Rooy&Safarova’s account fails to derive the following three empirical patterns.

First, however one may characterize the semantic difference between the reading double-checking  $p$  and the reading double-checking  $\neg p$ , that difference must be correlated with the use of Positive Items (PIs like *too*, *some* and *already*) versus Negative Items (NIs like *either*, *any* and *yet*). Examples (11) with *too*, (20) with *some* and (22a) with *already* unambiguously have the reading double-checking  $p$ , whereas (12) with *either*, (21) with *any* and (22b) with *yet* unambiguously have the reading double-checking  $\neg p$ .

- (20) A: You guys must be starving. You want to get something to eat?  
 S: Yeah, isn’t there **some** vegetarian restaurant around here – Moosewood, or something like that? (PI-question double-checking  $p$ )
- (21) Scenario: A and S are vegetarian.  
 S: I’d like to take you 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 is really no place to go to in Hyde Park.  
 S: Oh, really, isn’t there **any** vegetarian restaurant around here? (NI-qu. checking  $\neg p$ )
- (22) a. Isn’t Peter helping you **already**? (PI-question double-checking  $p$ )  
 b. Isn’t Peter helping you **yet**? (NI-question double-checking  $\neg p$ )

In Romero&Han (2004), the distribution of PIs/NIs follows from the way the two readings are compositionally derived. When *not* scopes over VERUM in (13LF), the reading double-checking  $p$  obtains and PIs are licensed because they are not in the immediate scope of negation (Ladusaw 1980, Linebarger 1987). When VERUM scopes over *not* in (14LF), the reading double-checking  $\neg p$  arises and NIs are licensed because they are in the immediate scope of negation. In Rooy&Safarova, it is left unexplained how the temporal anchoring of the UV can determine the distribution of PIs/NIs.<sup>2</sup>

Second, preposed negation questions with NIs necessarily convey a previous epistemic bias towards  $p$ . In contrast, non-preposed negation questions with NIs can be used in an unbiased way ((2S), repeated below as (23S)), or with contextual evidence bias for  $\neg p$  ((24)). E.g., (24S), with non-preposed negation, may convey a mild bias towards  $\neg p$  (=John does not drink alcohol) given the received contextual evidence; but (24S’), with preposed negation, necessarily conveys

<sup>2</sup>An alternative within the Decision Theory approach would be to abandon the temporal anchoring idea and to argue that the purpose of *any* in (21) is to turn a settled question into an unsettled one, in the spirit of van Rooy (2003): the speaker originally assumed  $p$  (= “there is a vegetarian restaurant near here”), A’s utterance implies  $\neg p$  for a possibly restricted set of vegetarian restaurants, and S’s question with *any* formulates the unsettled question  $\neg p'$ ? for a wider set of vegetarian restaurants. That would give us the schema (1) below:

- (1) Schema, where  $p \subseteq p'$ :
- |   |            |                     |
|---|------------|---------------------|
| Utility of $\neg p$ (at current state)  | $\implies$ | $p$ -reading (11).  |
| Utility of $\neg p'$ (at current state) | $\implies$ | $p'$ -reading (12). |

However, this analysis cannot extend to *either*, which is not the widening counterpart of *too*. Nor can it extend to *yet*, which is not the widening counterpart of *already*.

that the speaker originally expected  $p$  (=John drinks alcohol) before the contextual evidence was encountered. VERUM can account for this difference: preposed negation questions have VERUM, which induces a previous epistemic bias; non-preposed negation questions do not have VERUM and hence can be neutral or get a contextual evidence bias (from “intent” or UV). The account in Rooy&Safarova, not having VERUM, lumps together both types of questions and cannot make the distinction.

- (23) Scenario: The speaker is organizing a party and she is in charge of supplying all the non-alcoholic beverages for teetotalers. The speaker is going through a list of people that are invited. She has no previous belief or expectation about their drinking habits.

A: Jane and Mary do not drink.

S: OK. What about John? Does he not drink (either)? (No bias)

S’: # OK. What about John? Doesn’t he drink (either)? (Bias for  $p$ )

- (24) Scenario: At a party, A tells S that Mary doesn’t drink alcohol. Then S realizes that what John is drinking next to them is water.

S: Does John not drink alcohol either? (Contextual evidence bias for  $\neg p$ )

S’: Doesn’t John drink alcohol either? (Original epistemic bias for  $p$ )

Third, given that epistemic *really* expresses VERUM in declaratives (see (6b)), we need a VERUM-account for *really*-questions. Once we have it, and since the epistemic effects with *really* and preposed negation are parallel (original bias before any contextual evidence, opposite polarity between question and bias), the VERUM account provides a unified analysis. Under Rooy&Safarova, the parallel behaviors must be derived from different sources.

## 4 The contribution of *Really*/VERUM and the Answer Pattern

Certain particles –e.g. German *ja* in (25)-(26) (Kratzer 1999) and English *obviously* in (27c) (von Fintel&Iatridou 2003)– and certain constructions –e.g. parentheticals (Potts 2002) and epithets (Potts (2003)– have been argued to contribute not to the propositional content in the standard way, but to the expressive meaning. A first diagnosis comes from sentence embedding: the semantic contribution of these expressions cannot be embedded under *because*. To see this, compare *obviously* in (27c) with *it is obvious that* in (27b). In (27b), the fact that Mary’s detachment is obvious may be the cause of John being upset. Thus, the sentence is compatible with scenario (27a). In(27c), Mary’s detachment itself –on which the speaker comments that it is obvious– has to be the cause. Thus the sentence is false in scenario (27a). Interestingly, *really* / VERUM patterns like these expressive items, as in (28).

- (25) Stacie hat ihre Job verloren, weil sie ja in der Gewerkschaft was.

Stacie hat her job lost, because she JA in the union was

’Stacie lost her job, because she was JA in the union.’

- (26) *Ja*  $\alpha$  is appropriate in a context  $c$  if the proposition expressed by  $\alpha$  in  $c$  is a fact of  $w_c$  which -for all the speaker knows- might already be known to the addressee. (Kratzer 1999)

- (27) a. Scenario: John and Mary made the deal that they would pretend to be in love. In reality, they do not love each other nor care about each other’s love.

- b. John is upset because it is obvious that Mary doesn't love him.
- c. John is upset because obviously Mary doesn't love him.

(28) Kate didn't show up because she really couldn't make it.

A second, related diagnosis is dissent dialogs, used in Papafragou (to appear) for certain epistemic modals, as in (29). The speaker S in (29) can be taken to be disagreeing with the embedded proposition 'This professor is very smart', not with the modal proposition 'This professor must be very smart'. The same holds for *obviously* in (30). Note that *really* in (31) patterns the same way. That is, the content of expressive items cannot be challenged by another speaker; the challenge affects only the proposition embedded under the expressive item.

(29) A: This professor must be very smart.  
 S: That's not true.  $\Rightarrow \neg(\text{he's very smart}), \quad ? \neg(\text{he must be very smart})$

(30) A: This professor is obviously very smart.  
 S: That's not true.

(31) A: This professor really is very smart.  
 S: That's not true.

Taking *really*/VERUM as an expressive item, we can account for the meaning of the answers in (32) and (33). In (32), the *no*-answer in (32A') does not negate the proposition FOR-SURE-CG( $\lambda w$ .Jorge brought present in  $w$ ), but the embedded proposition  $\lambda w$ .Jorge brought present in  $w$ . Similarly, the *yes* answer in (32A) states agreement not with the VERUM proposition, but with the embedded proposition.

(32) Q: Did Jorge really bring a present?  
 LF: [  $Q$  VERUM [ Jorge brought a present for the baby ] ]  
 A: Yes, he did. A': No, he didn't.

The same behavior is found in (33). The *no*-answer in (33A') does not negate the proposition FOR-SURE-CG( $\lambda w$ .( $\neg$ ) Mary visited Sue in  $w$ ), but the embedded proposition  $\lambda w$ .Mary visited Sue in  $w$ . And the *yes* answer in (33A) asserts agreement not with the VERUM proposition, but with the embedded proposition.

(33) Q: Didn't Mary visit Sue?  
 LF: [  $Q$  (not) VERUM (not) [ Mary visited Sue ] ]  
 A: Yes, she did. A': No, she didn't.

## 5 Conclusions

Two analyses of the epistemic bias in examples (1)-(3) have been examined: the VERUM-approach in Romero&Han (2002) and in Romero&Han (2004), and the Decision Theory approach in Nilsenova&Rooy (2003) and in Rooy&Safarova (2003).

Comparing them, we have seen that, while the use of Utility Values captures the difference between pronouncing one cell of a question's partition or the other (thus formalizing Romero&Han's

(2004) notion of “intent”), the VERUM operator is still needed to derive the full array of data. First, VERUM derives the correlation between Ladd’s readings and the distribution of Positive vs Negative Items. Second, it distinguishes between preposed negation *yn*-questions with Negative Items and the corresponding non-preposed counterparts. Third and finally, it accounts for the parallel behavior of *really* questions and preposed negation questions.

Within the VERUM-approach, it has been shown that VERUM / *really* sometimes contributes to the expressive content rather than to the propositional content of the sentence (cf. *obviously*). In particular, in dissent/assent dialogs, the dissent/assent response expresses disagreement/agreement not with the proposition VERUM *p*, but with the embedded proposition *p*. This explains the pattern of *yes* and *no* answers to these questions.

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