Revisiting *really* Positive Questions and High Negation Questions

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1. Introduction

■ Several polar question (PQ) forms:

(1)	Is Jane coming?	Positive Question	**PosQ**
(2)	Is Jane not coming?	Low Negation Question	**LoNQ**
(3)	Isn't Jane coming?	High Negation Question	**HiNQ**
(4)	a. Is Jane really coming?	*really* Positive Question	***really*-PosQ**
	b. IS Jane coming?	Positive Question with Focus on tensed verb	**F-PosQ**

(5) Original bias (OB) of the Speaker for a proposition p: (Domaneschi et al. 2017)
Belief or expectation of the speaker that *p* is true, based on his epistemic state prior to the current situational context and conversational exchange.

(6) [Scenario: An immigration officer in Canada welcomes the next traveler, about whose citizenship he has no previous expectations (or contextual cues), and asks:]
a. Are you a Canadian citizen? PosQ
⇝ No bias for 'You are not Canadian'
b. # Are you really a Canadian citizen? *really*-PosQ
⇝ Bias for 'You are not Canadian'

(7) Scenario: S is in charge of supplying the non-alcoholic beverages for a party. S is going through the list of guests. S has no previous belief or expectation about their drinking habits. (Shortened from Romero & Han 2004)
A: Jane and Mary do not drink.
S: a. OK. What about John? Does he not drink? LoNQ
⇝ No bias for 'John drinks'
b. # Ok. What about John? Doesn't he drink? HiNQ
⇝ Bias for 'John drinks'

■ Zooming into ***really*-PosQ**:
Really-PosQ are felicitous in contradiction scenarios:

(8) A: We can't leave yet. We need to wait for Jane.
S: Is she really coming?

■ Zooming into **HiNQs**:

- Ladd's (1981) intuitive ambiguity:
  Ladd argues that, while expressing original speaker bias for p, a HiNQ *[n't p?]* is ambiguous between:
  - an outer-negation reading double-checking p: (9)
    → disambiguated via PPIs like *some* and *too*
  - an inner-negation reading double-checking ¬p: (10)
    → disambiguated via NPIs like *any*

(9) A: You guys must be starving. You want to get something to eat? (Ladd 1981)
S: Yeah, isn't there a (/some) vegetarian restaurant around here? **Outer-HiNQ**

(10) S: I'd like to take you guys 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's not really any place to go in Hyde Park. (Ladd 1981)
S: Oh, really, isn't there a (/any) vegetarian restaurant around here? **Inner-HiNQ**

- Outer-HiNQs are felicitous in suggestion scenarios like (9) and in contradiction scenarios like (11)

(11) A: Ok, now that Stephan has come, we are all here. Let's go!
S: Isn't Jane coming too?

DATA ON BIAS

	Existence?	Direction	Scenarios
Really-PosQ	yes	for ¬p	contradiction
Outer-HiNQ	yes	for p	contradiction and suggestion

■ Theoretical approaches:
- **Line A**: Expressed proposition line
  van Rooij and Šafářová (2003), AnderBois (2011, 2019), Northrup (2014)
- **Line B**: VERUM line
  Romero & Han (2004), Romero (2006), Repp (2006, 2013), Romero (2015), Frana & Rawlins (2019), Jeong (2021)
- **Line C**: Speech Act line
  Reese (2006, 2007), Asher & Reese (2007); Krifka (2012/2017, 2015), Goodhue (2018, 2022a,b)

■ Converging picture in the literature on HiNQs in their outer negation p-checking reading:

(12) Outer-HiNQs:

a. [Q [Σ_{HiNeg} [SentenceRadical …]]]	Line A (An19)
b. [Q [$\text{FALSUM}_{\text{HiNeg}}$ [SentenceRadical]]]	Line B (Re13, Ro15, Fr&Ra19)
c. [Q [$\neg_{\text{HiNeg}}$ ASSERT [SentenceRadical …]]]	Line C (Go22a)

- Three main points of disagreement in the literature:

  I. Status of Ladd's (1981) inner-negation ¬p-checking interpretation of HiNQs.

  II. Meaning **dimension** to which the operator contributes its meaning.

  III. Procedure to derive the **existence** and **direction** of the original speaker **bias.**

- Aim of the present talk:
  This talk revisits *really*-PosQs and HiNQs in order to…

  Goal ①: to advance the VERUM/FALSUM line in the Repp (2013) / Romero (2015): Recasting VERUM/FALSUM in Murray's (2014) framework Update with Modal Centering for evidentials

  Goal ②: to evaluate recent competing analyses wrt issues II and III: extension of Repp (2013) / Romero (2015) proposed here vs. Frana & Rawlins (2019) vs. Goodhue (2022a)

- Roadmap

  §2 VERUM/FALSUM analysis in Repp (2013) / Romero (2015)
  §3 Murray's (2014) framework for evidentials
  §4 Proposal: Recasting VERUM/FALSUM in Murray's (2014) framework
  §5 Evaluating the proposed VERUM/FALSUM account
  §6 Evaluating the VERUM/FALSUM account in Frana & Rawlins (2019)
  §7 Evaluating the Speech Act account in Goodhue (2022a)
  §8 Conclusions

2. VERUM/FALSUM analysis in Repp (2013) / Romero (2015)

- Romero & Han (2004) argue that *really* and high negation introduce a VERUM operator. Based on insights from Höhle (1992), they define it as in (13).
  At that point, the contribution of the operator is treated as an at-issue entailment.

(13) $[\![\text{VERUM}]\!] = \lambda p_{<s,t>}.\lambda w_0.\ \forall w \in Epi_x(w_0)\ \forall w' \in Conv_x(w)\ [\ p \in CG_{w'}]$
= "x is sure that, in all the worlds satisfying x's conversational goals, p is added to the CG"

- Three empirical arguments in the literature for <u>not</u> treating the contribution of the operator as an at-issue entailment:
  - Challengeability (Frana & Rawlins 2019)
  - Answer pattern (Romero 2006, Gutzmann & Castroviejo-Miró 2011)
  - Conditional antecedents (Romero 2015)

■ Repp (2013) and Romero (2015): non-at-issue contribution of VERUM and FALSUM

(14) VERUM:
a. At-issue content: $\lambda p_{<s,t>}.\ p$
b. CG-man. content: $\lambda p_{<s,t>}.\lambda w_0.\ \forall w \in Epi_x(w_0)\ \ \forall w' \in Conv_x(w)\ [\ p \in CG_{w'}]$
$\textsc{ForSure}_x(p \in CG)$ [Abbreviation]

(15) FALSUM:
a. At-issue content: $\lambda p_{<s,t>}.\ \neg p$
b. CG-man. content: $\lambda p_{<s,t>}.\lambda w_0.\ \forall w \in Epi_x(w_0)\ \forall w' \in Conv_x(w)\ [\ p \notin CG_{w'}]$
$\textsc{ForSure}_x(p \notin CG)$ [Abbreviation]

■ Application to declaratives:

(16) a. Tom really is tired.
b. $\textsc{Force}_{Decl}$ [VERUM [Tom is tired]]
c. Meaning: at-issue: Tom is tired
non-at-issue: $\textsc{ForSure}_a$(Tom is tired ∈ CG)

(17) A: Tom really is tired.
S: That can't be true. / You are wrong. = ¬(T is tired) ≠ ¬$\textsc{ForSure}_a$(T is tired)

(18) A: He found something. (Szabolcsi 2004)
S: Wrong! He didn't find something. ✓ ¬ > ∃
c. [$\textsc{Force}_{Decl}$ [FALSUM [he found something]]
d. Meaning: at-issue: ¬(He found something)
non-at-issue: $\textsc{ForSure}_a$(He found something ∉ CG)

■ Application to polar questions:

(19) Q-morpheme:
a. At-issue content: $\lambda p_{<s,t>}.\ \{p, \neg p\}$
b. CG-management content: $\lambda p_{<s,t>}.\ \{p, \neg p\}$

○ *Really*-PosQ:

(20) a. Is Jane really coming?
b. LF: [Q [VERUM [Jane is coming]]]

(21) a. At-issue content: { Jane is coming, ¬(Jane is coming) }
b. CG-man. content: { $\textsc{ForSure}_x$ (Jane is coming ∈ CG),
¬$\textsc{ForSure}_x$ (Jane is coming ∈ CG) }

(22) A: Is Jane really coming?
S: Yes. ≈ Jane is coming ≈ $\textsc{ForSure}_x$ (Jane is coming ∈ CG)
S': No. = ¬(Jane is coming) ≠ ¬$\textsc{ForSure}_x$ (Jane is coming ∈ CG)

- Outer HiNQ:

(23) a. Isn't Jane coming too?
b. LF: [Q [FALSUM [Jane is coming]]]

(24) a. At-issue content: { ¬(Jane is coming), ¬¬(Jane is coming) }
That is: { Jane is coming, ¬(Jane is coming) }
b. CG-man. content: { FORSURE$_x$ (Jane is coming ∉ CG),
¬FORSURE$_x$ (Jane is coming ∉ CG) }

(25) A: Isn't Jane coming too?
S: Yes. = Jane is coming ≠ ¬FORSURE$_x$ (Jane is coming ∉ CG)
S': No. ≈ ¬(Jane is coming) ≈ FORSURE$_x$ (Jane is coming ∉ CG)

■ Application to conditional antecedents:
High negation is licit in subjunctive antecedents when interpreted counterfactually but illicit in Anderson-style scenarios (Schwarz & Bhatt 2006, Ippolito & Su 2009): (26)-(27). Same with conditional antecedents containing (VERUM-)*really* (Romero 2015).

(26) If there had**n't$_{\text{High}}$** been some$_{\text{PPI}}$ oil in the tank, the furnace would have exploded.

(27) # If there had**n't$_{\text{High}}$** been some$_{\text{PPI}}$ oil in the tank, the furnace would have made exactly the noise that it in fact did. So, it's likely that the tank was empty.

(28) [$_{\text{CP}}$ If [FALSUM [$_{\text{IP}}$ there had been some oil in the tank]]] then q
a. = λw$_0$. ∀w ∈ Simw$_0$ (λw'. there was oil in talk at w') : q(w)
b. ≠ λw$_0$. ∀w ∈ Simw$_0$ (λw'. FORSURE$_x$(w')(there was oil in tank ∉ CG)) : q(w)

(29) a. At-issue content: λw. ¬(there was oil in tank at w)
b. Raised QUD: { λw. FORSURE$_x$(w)(there was oil in tank ∉ CG),
λw. ¬FORSURE$_x$(w) (there was oil in tank ∉ CG) }

DATA ON MEANING DIMENSION

	Challengeability	Answer pattern	Conditional antecedents
Really	not directly	yes=p, no=¬p	no semantic embedding
High negation	not directly	yes=p, no=¬p	no semantic embedding

■ Interestingly, VERUM/FALSUM share these characteristics with evidentials[1]

This takes us to our goal ①:
Recasting VERUM/FALSUM in a general theory of evidentials

[1] Caveat: Not all evidentials pattern alike.

3. A framework for evidentials (and alike): Murray (2014)

■ Core data:

(30) É-hó'tàhéva-∅ Sandy (# … but the truth is that she didn't win)
3-win-**DIR** Sandy
'Sandy won (I witnessed).'
⇝ Speaker proposes to update the current C(ontext) S(et) p_0 with q (=Sandy won).

(31) É-hó'tàhéva-sestse Sandy (✓ … but I was there and she didn't.)
3-win-**RPT** Sandy
'Sandy won (I witnessed).'
⇝ Speaker does not propose to update the current CS p_0 with q (=Sandy won).

(32) Floyd won the race, **I hear**.
⇝ Speaker proposes to update the current CS p_0 with ◊q (= It is (at least) possible that Sandy won).

■ Three core components:

- at-issue content q: it introduces a propositional discourse referent dref;
  Speaker proposes to update the CS with (some version of) it.
- non-at-issue content q: it does not introduce a propositional discourse referent;
  it directly updates the CS.
  crucially, it determines the argument of the illocutionary force.
- illocutionary force: $\text{Force}_{\text{Declarative}}$ (r) ⇨ intersect proposition r with CS
  $\text{Force}_{\text{Interrogative}}$ (r) ⇨ partition the CS

■ Case 1: Direct evidential in Cheyenne

(33) [[Sandy won] **DIR**].
⇝ Speaker proposes to update the current CS p_0 with q (=Sandy won).

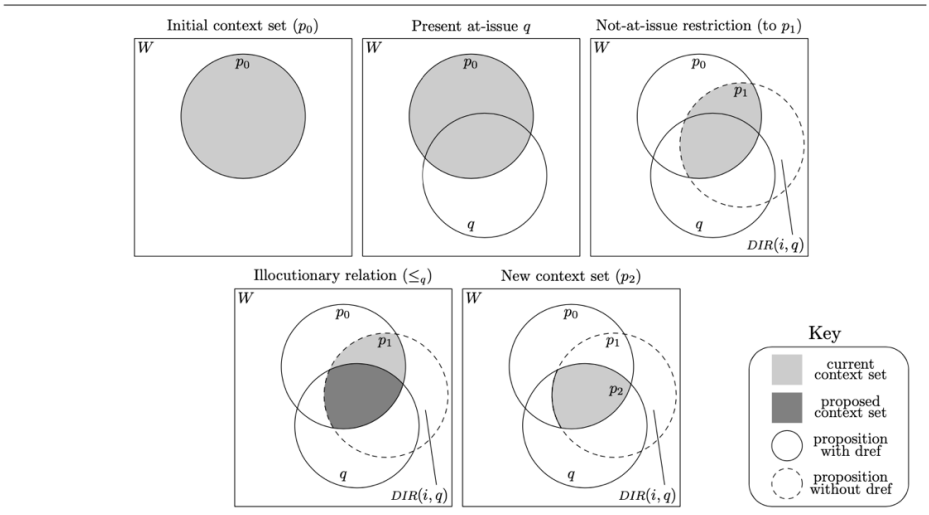


Figure 1 Updates for (11): Cheyenne direct evidential

■ Case 2: Reportative evidential in Cheyenne

(34) [[Sandy won] **RPT**].
⇝ Speaker does not propose to update the current CS p_0 with q (=Sandy won).

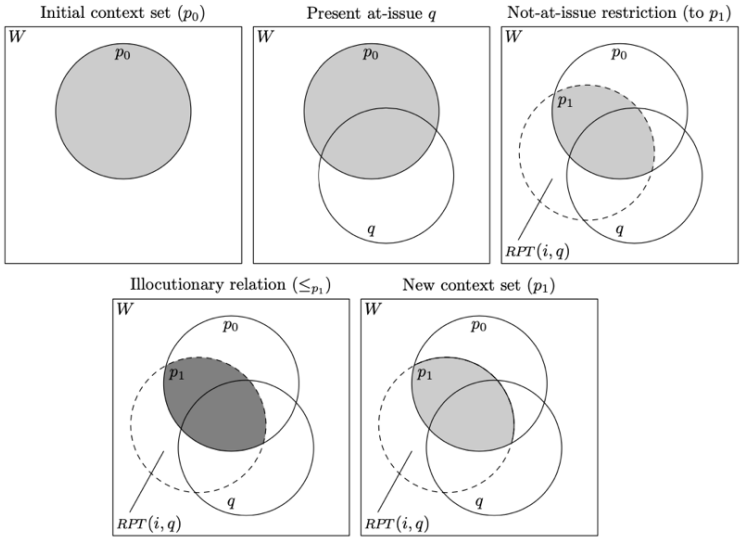


Figure 3 Updates for (14): Cheyenne reportative evidential

■ Case 3: Slifting in English

(35) Floyd won the race, **I hear**.
⇝ Speaker proposes to update the current CS p_0 with ◊q (= It is (at least) possible that Sandy won).

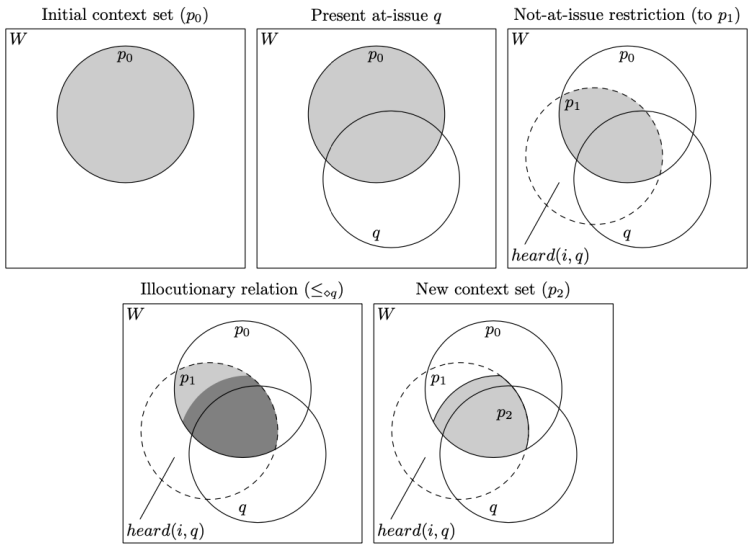


Figure 5 Updates for (20): English evidential parentheticals

■ See Appendix for formalization in the framework Update with Modal Centering UC_ω.

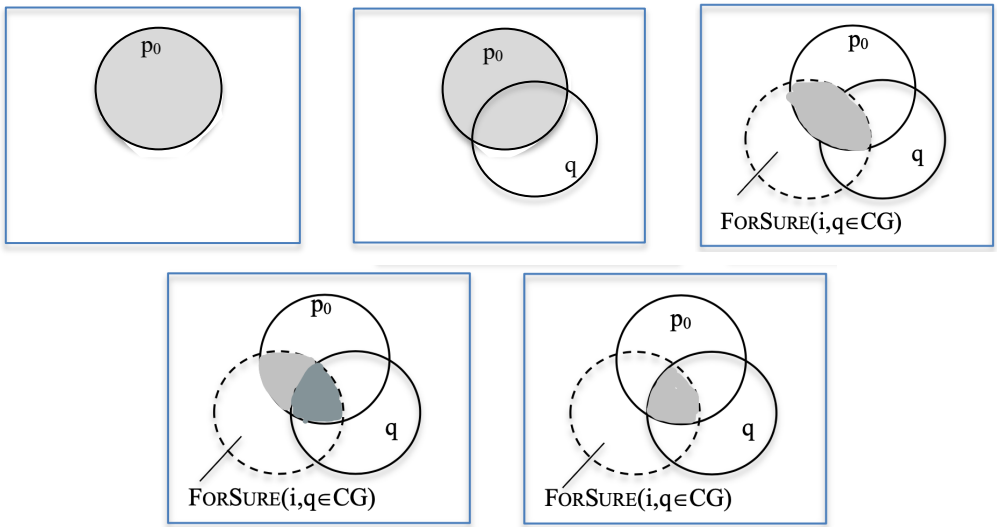
4. Proposal: Recasting VERUM/FALSUM in Murray's (2014) framework

■ In this section, we propose to recast Repp's (2013) and Romero's (2015) VERUM/FALSUM approach within Murray's discourse framework for evidentials.

■ VERUM in declaratives:

(36) VERUM [q]:
a. At-issue content: q
b. Evidential non-at-issue content: FORSURE$_x$(q∈CG) [Abbreviation]

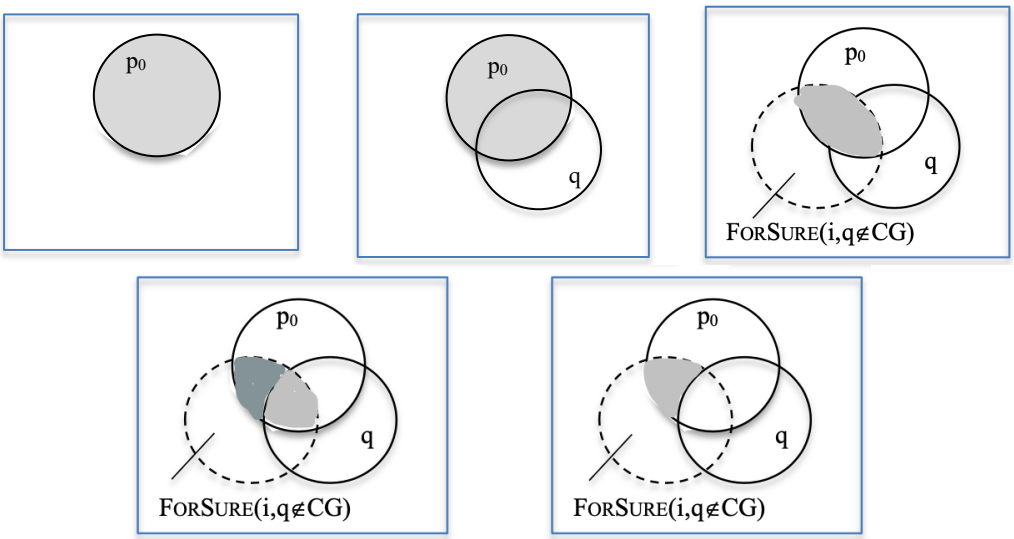
(37) Sandy really won.
LF: [FORCE$_{Decl}$ [VERUM [Sandy won]]]



■ FALSUM in declaratives:

(38) FALSUM [q]:
a. At-issue content: q
b. Evidential non-at-issue content: FORSURE$_x$(q∉CG) [Abbreviation]

(39) (Wrong!) Sandy didn't win (some race).
LF: [FORCE$_{Decl}$ [FALSUM [Sandy won]]]



■ Evidentials in interrogatives:
The evidential and the Q-operator may interact in different ways:

- Quechua's reportative evidential RPT:

(40) A to B: How are you? (Matthewson et al. 2007)
C to B: Imayna-s ka-sha-nki
Know-PRT be-PROG-2
'(She says) 'How are you?' → Repeat Question

(41) a. [**RPT** [FORCE$_{Interr}$ [q]]]
b. 'It has been said 'How are you?''

- Cheyenne's reportative evidential RPT (cf. German *wohl* in Eckardt 2020):

(42) Mó=é-hó'taheva-sestse Sandy? (Murray 2010)
y/n=3-win-RPT.3sg Sandy
'Given what you heard, did Sandy win?'

(43) a. [FORCE$_{Interr}$ [**RPT** [q]]]
b. { info state with: , info state with: }
at-issue: ~~q~~ at-issue: ~~¬q~~ .
non-at-issue: RPT(i,q) non-at-issue: RPT(i,¬q)

■ VERUM/FALSUM do not seem to interact with the Q-operator in either of those two ways:

(44) Did Sandy really win?

(45) a. ≠ [**RPT** [FORCE$_{Interr}$ [q]]]
b. ≠ 'i is sure that, in all the worlds satisfying i's conversational goals, the issue/question {q, ¬q} has been asked.'

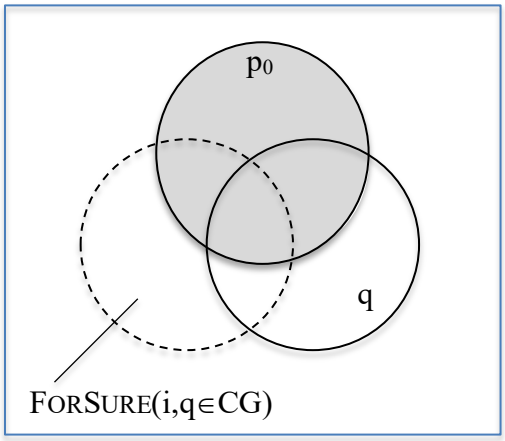
(46) a. ≠ [FORCE$_{Interr}$ [**RPT** [q]]]
b. ≠ { info state with: , info state with: }
at-issue: … at-issue: …
non-at-issue: FORSURE(i,q) non-at-issue: FORSURE(i,¬q)

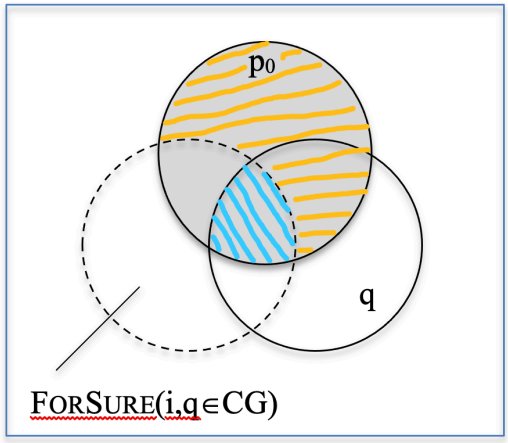
■ Idea:
VERUM/FALSUM represent a third type of interaction with the Q-operator:

(47) a. [FORCE$_{Interr}$ [**VERUM/FALSUM** [q]]]
b. { info state with: , info state with: }
at-issue: … at-issue: …
non-at-issue: FORSURE(i,…) non-at-issue: ¬FORSURE(i,…)

■ VERUM in *really*-PosQs:

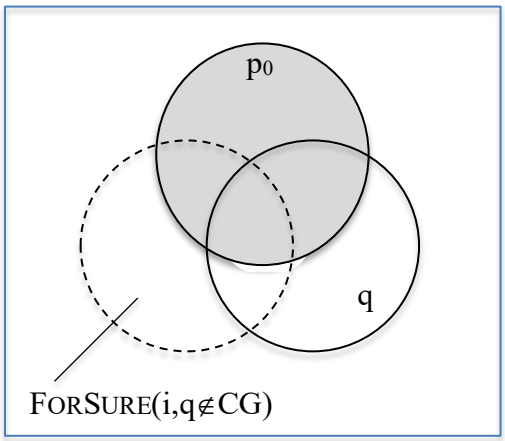
(48) a. Did Sandy really win?
b. [Q/FORCE$_{Interr}$ [VERUM [Sandy won]]]
c. { info state with , info state with }
at-issue: q at-issue: ~~¬q~~ (/ ◇q)
non-at-issue: FORSURE(i,q∈CG) non-at-issue: ¬FORSURE(i,q∈CG)

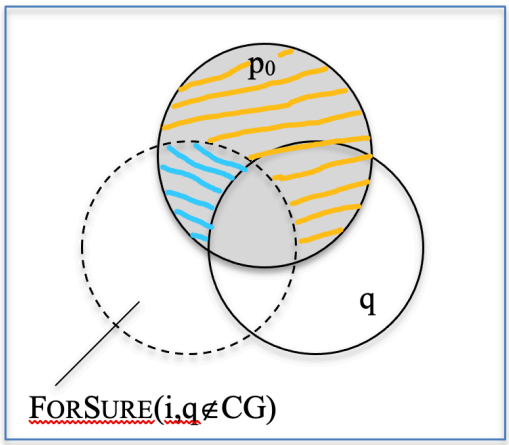




■ FALSUM in outer-HiNQs:

(49) a. Didn't Sandy win (too)?
b. LF: [Q/FORCE$_{Interr}$ [FALSUM [Sandy won]]]
c. { info state with , info state with }
at-issue: ¬q at-issue: ~~¬¬q~~ (/ ◇¬q)
non-at-issue: FORSURE(i,q∉CG) non-at-issue: ¬FORSURE(i,q∉CG)





■ For a formalization in the framework Update with Modal Centering UC$_{\omega}$, see Appendix.

We come now to our goal ②:
Evaluating current approaches wrt open issues II (meaning dimension effects) and III (existence and direction of the bias)

5. Evaluating the proposed VERUM/FALSUM account

5.1. Meaning dimension effects

- Challengeability
  As at-issue content, q is proposed to be added to the CS. Such a proposal can be directly challenged.
  As non-at-issue content, FORSURE(i,…q…) is directly added to the CS. Such a proposal cannot be challenged directly (though it can indirectly).

- Answer pattern (see Goodhue 2022a)
  Yes- and *no*-answers affirm or negate a propositional dref (Krifka 2013).
  Since the at-issue content q introduces a dref, *yes* and *no* can affirm it and negate it.
  Since the non-at-issue content FORSURE(i,…q…) does not introduce a dref, *yes* and *no* cannot affirm or negate this content.

- Conditional antecedents
  Since at-issue content semantically embeds under *if* but non-at-issue content (typically)[2] does not, the semantic content of the *if*-clause concerns q and not FORSURE(i,…q…)

5.2. Existence and direction of the bias

- Existence of the bias à la Romero & Han (2004):

(50) Principle of Economy: Do not use a meta-conversational move / very-high certainty evidential unless necessary (to resolve epistemic conflict or to ensure Quality).

⇨ Can this be derived from more general principles (cf. precision level with degree expressions)?

[2] See Murray (2010) for potential counterexamples.

■ Direction of the bias and scenarios as in Romero & Han (2004):[3]

(51) a. Did Sandy really win?
b. { info state with, at-issue: q, non-at-issue: FORSURE(i,q∈CG)) | info state with, at-issue: ~~q~~, non-at-issue: ¬FORSURE(i,q∈CG)) }

(52) Intent of *really*-PosQ:
"Are you sure we should add to CG that Jane is coming?"
"Do you have **complete evidence** that p?"
"Can you provide info –and, if so, what info– that would make me **conclude** p?"

(53) Intent of *really*-PosQ in a contradiction scenario:
a. # Given that I assume p and that you implied ¬p, can you provide information – and, if so, what information – that would make me **conclude** p?
b. ✓ Given that I assume ¬p and that you implied p, can you provide information – and, if so, what information – that would make me **conclude** p?

(54) a. Didn't Sandy win (too)?
b. { info state with, at-issue: ¬q, non-at-issue: FORSURE(i,q∉CG)) | info state with, at-issue: ~~¬q~~, non-at-issue: ¬FORSURE(i,q∉CG)) }

(55) Intent of an outer-HiNQ:
"Are you sure we should not add to CG that Jane is coming?"
"Do you have any (strong or weak) **doubts about** p?"
"Can you provide information –and, if so, what info– that would make me **doubt** p?"

(56) Intent of an outer-HiNQ in a contradiction scenario:
a. ✓ Given that I assume p and that you implied ¬p, can you provide information – and, if so, what information – that would make me **doubt** p?
b. # Given that I assume ¬p and that you implied p, can you provide information – and, if so, what information – that would make me **doubt** p?

(57) Intent of an outer-HiNQ in a suggestion scenario:
a. ✓ Given that I assume p, that you do not know any answer to R and that p is a possible answer to R, can you provide information – and, if so, what information – that would make me **doubt** p and would prevent us from adding p to CG?
b. # Given that I assume ¬p, that you do not know any answer to R and that ¬p is a possible answer to R, can you provide information – and, if so, what information – that would make me **doubt** p and would prevent us from adding p to CG?

⇨ This correctly derives the direction of the bias in the relevant scenarios:

[really p?]	original speaker bias for ¬p	in contradiction scenarios
[n't p (too)?]	original speaker bias for p	in contradiction scenarios and in suggestion scenarios

[3] The intuitive notion of "intent" of a question –the potential further sub-questions that the Speaker may want to pursue if the proposition in the sentence radical is true– can be formalized in different ways, e.g. sub-issues (AnderBois 2011) or highlighting in Inquisitive Semantics (Ciardelli et al. 2013).

6. Evaluating the VERUM/FALSUM account in Frana & Rawlins (2019)

■ The authors follow Repp (2013) and Romero (2015) in taking the contribution of VERUM/FALSUM to be non-at-issue.
Based on data like (58), which show presupposition-like projection –namely, filtering–, they tentatively propose to treat VERUM/FALSUM's contribution as a presupposition: (59)-(60).[4]

(58) A: It might rain later; you should bring a rain jacket.
S: If it rains, won't the party be indoors? ⇨ [If r, then [Q [FALSUM p]]]

(59) $[\![\text{VERUM}]\!] = \lambda p_{<s,t>}.\ p$
Defined only if $\forall w \in Epi_x(w_0)\ \forall w' \in Conv_x(w)\ [\ p \in CG_{w'}\ ]$

(60) $[\![\text{FALSUM}]\!] = \lambda p_{<s,t>}.\ p$
Defined only if $\forall w \in Epi_x(w_0)\ \forall w' \in Conv_x(w)\ [\ p \notin CG_{w'}\ ]$

■ The authors emphasize the similarity between VERUM/FALSUM and evidentials.

⇨ Very important connection, which has inspired the proposal above.

■ Representation of *really*-PosQ:

(61) Are you really going (to the party)?

(62) $[\![Q\ [\ \text{VERUM}\ [\text{you are going}]]\ ]\!] = \{$ you are going, ¬(you are going) $\}$
Defined only if $\forall w \in Epi_A(w_0)\ \forall w' \in Conv_A(w)\ [$ you are going $\in CG_{w'}\ ]$

■ Representation of outer-NiNQ:

(63) Aren't you going out (too)?

(64) $[\![Q\ [\ \text{FALSUM}\ [\text{you are going out}]]\ ]\!] = \{$ you are going out, ¬(you are going out) $\}$
Defined if $\forall w \in Epi_A(w_0)\ \forall w' \in Conv_A(w)\ [$ you are going out $\notin CG_{w'}\ ]$

[4] The main contribution of the paper is to explain the effect of the particle *mica* in negative PQs in Italian.

6.1. Meaning dimension effects

- Since VERUM/FALSUM's contribution is non-at-issue, the dimension effects are derived as we saw above:
  - Challengeability
  - Answer pattern
  - Conditional antecedents

- Note, though, that (at least) some evidential-like expressions also show parallel presupposition projection behavior in the same environment: e.g. German *wohl* in (65). This may mean that (at least) some evidentials are presuppositional or that the non-at-issue behavior of evidentials is (at least) partly projective. More research needed!

(65) Wenn Peter nicht in seinem Buero ist, ist er wohl im Fitness Studio.
If Peter not in his office is, is he WOHL in fitness gym
'If Peter is not in his office, he probably/WOHL is at the gym.'
⇨ [If r, then [WOHL p]]

- Potential problem
  Given the predicted semantics in (67), sentence (66S) presupposes that the information (68a) is already in the CG and asks the Addressee to resolve the issue in (68b). But this issue is already resolved (by virtue of Epi being reflexive)! In other words, this set-up violates Buering's (2003) interrogativity principle in (69):

(66) A: I am going to the party.
S: Are you really going?

(67) $[\![Q\ [\ \text{VERUM}\ [\text{you are going}]]\ ]\!] = \{$ you are going, ¬(you are going) $\}$
Defined only if $\forall w \in Epi_A(w_0)\ \forall w' \in Conv_A(w)$ [you are going $\in CG_{w'}$]

(68) a. Already in CG:
$\forall w \in Epi_A(w_0)\ \forall w' \in Conv_A(w)$ [you are going $\in CG_{w'}$]
b. Partition induced, with the illocutionary relation added in blue for each cell if chosen:
$\{\ \forall w \in Conv_A(w_0)$ [you are going $\in CG_w$] , $\forall w \in Conv_A(w_0)$ [¬(you are going) $\in CG_w$] $\}$

(69) Interrogativity Principle: (Büring 2003)
Ask a question Q only if the context set c does not entail a complete answer to Q.

⇨ By treating the contribution of VERUM/FALSUM as a presupposition of the entire question, the CG already contains information that entails the answer to the current question. This violates the Interrogativity Principle and should thus lead to infelicity.

6.2. Existence and direction of the bias

■ Existence of the bias as Romero & Han (2004):

(70) Principle of Economy: Do not use a meta-conversational move unless necessary (to resolve epistemic conflict or to ensure Quality).

⇨ Can this be derived from more general principles?
[Inherited from Romero & Han 2004]

■ Direction of the bias and scenarios:
FALSUM in outer-HiNQs allows, illustrated again in (71)-(72), allows for two possibilities:
(i) Addressee is sure that ¬p should be added to CG.
(ii) Addressee has not taken a stance towards p, ie, she is neutral wrt p

(71) Aren't you going out (too)?

(72) $[\![Q\ [\ \text{FALSUM}\ [\text{you are going out}]]\ ]\!] = \{$ you are going out, ¬(you are going out) $\}$
Defined if $\forall w \in Epi_A(w_0)\ \forall w' \in Conv_A(w)$ [you are going out $\notin CG_{w'}$]

- Possibility (i): contradiction scenarios
  A indicated that A has evidence for ¬p.
  S has a bias (towards p or towards ¬p) leading to a quality dilemma.
  To have a dilemma, **S's bias** must be contrary to H's position, that is, it must be **for p**.

- Possibility (ii): suggestion scenarios
  A took no stance about p/¬p.
  S has a bias (towards p or towards ¬p) leading to a quality dilemma.
  To have a dilemma, …**???**...

⇨ While the correct direction of the bias is secured in contradiction scenarios, it is not clear how it is derived in <u>suggestion</u> scenarios.

7. Evaluating the Speech Act account in Goodhue (2022a)

■ Key to this account is the operator ASSERT:[5] (73)
Crucially, the modal component is contributed to the at-issue content.

(73) $[\![\text{ASSERT}]\!] = \lambda p_{<s,t>}.\, \lambda w.\, \forall w' \in \text{Dox}_x(w)\, [\, p(w')\,]$
$= \lambda p_{<s,t>}.\, \Box_x p$ [Abbreviation]

■ (Outer-)HiNQs like (74) are argued to have the structure in (75), with negation scoping over the speech act operator ASSERT. This leads to the partition in (76):

(74) Didn't Jane eat?

(75) [Q [¬ ASSERT [Jane ate]]]

(76) { $\neg\Box_x$ Jane ate , $\Box_x$ Jane ate }

7.1. Meaning dimension effects

■ Reponse pattern:
Yes- and *no*-answers affirm or negate a propositional dref (Krifka 2013).
Since the at-issue content q introduces a dref, *yes* and *no* can affirm it and negate it.
But the content $\neg\Box_x p$ and $\Box_x p$, despite being at-issue, introduces no dref, hence *yes* and *no* cannot affirm or negate this content.

■ Challengeability:
If can be argued that challengeability involves some kind of anaphora, same as above.

■ Conditional antecedents:
Here we have no anaphora involved, just the clause including high negation. So the predicted representation for (77) would be (78):

(77) If there had**n't**$_{\textbf{High}}$ been some$_{\text{PPI}}$ oil in the tank, the furnace would have exploded.

(78) [$_{\text{CP}}$ If [¬ ASSERT [$_{\text{IP}}$ there had been some oil in the tank]]] then q
a. $\lambda w_0.\, \forall w \in \text{Sim}w_0\, (\neg\Box(\text{there was oil in tank})) : q(w)$
b. Paraphrase: "In all counterfactual worlds (max. similar to w_0) in which x lacks full certainty on there being oil in the tank, q is true"
⇨ Wrong truth conditions!

⇨ The at-issue treatment of the operator can be maintained for phenomena that involve a dref, but it leads to incorrect truth conditions in constructions when the clause containing high negation is directly embedded under another operator.

[5] For an implementation using Commitment Space Semantics, see Goodhue (2022b).

7.2. Existence and direction of the bias

■ Goodhue (2022a) attempts to derive the existence of original speaker bias in HiNQs from the competition with PosQs.

> ⇨ Important attempt to derive the existence of the bias from general pragmatic principles.

■ Notion of bias and ignorance:

(79) S is biased for p ⇔ $\Box_S$ p

(80) S is ignorant of whether p or ¬p ⇔ $\neg\Box_S$ p ∧ $\neg\Box_S \neg$p

■ Steps:

① Premise 1:
If S is ignorant of whether p or ¬p (and the truth of p/¬p is relevant), S's goal is to gain information.

② Premise 2:
If S wants to gain information, S will use the more informative question strategy.

③ Premise 3: PosQs are more informative than their HiNQs counterparts:

(81) Q_1 is more informative than Q_2 iff the following two conditions are satisfied:
a. $\exists p \in Q_1\ [\exists p' \in Q_2\ [p \subset p']]$
b. $\forall p \in Q_1\ [\neg\exists p' \in Q_2\ [p' \subset p]]$

④ Conclusion: If S is ignorant of whether p or ¬p, S will use the more informative PosQ.
That is: If S uses the less informative HiNQ, then S is not ignorant of whether p or ¬p. ⇨ Existence of bias

■ However: If instead of Premise 1 above we take Premise 1' below –which also feels true– the same derivation steps would take us to the Conclusion' below:

① Premise 1':
If S is biased for p or for ¬p but not certain about it (and the truth of p/¬p is relevant), S's goal is to gain information.

…

④ Conclusion': If S is biased for p or for ¬p but not certain about it, S will use the more informative PosQ.
That is: If S uses the less informative HiNQ, then it is not the case that S is biased for p or for ¬p but not certain about it.

■ Putting the two derivation together:

④ Conclusion: If S uses the less informative HiNQ, then S is <u>certain</u> about p or about ¬p.

⇨ Wrong empirical result: the proposed inference procedure derives the existence of speaker certainty (for p or for ¬p) in HiNQs, not the existence of (just) bias.

8. Conclusions

■ A proposal has been made to recast the VERUM/FALSUM account in Repp (2013) and Romero (2014) within Murray's (2014) general framework for universals.

■ Three recent competing approaches have been evaluated wrt (**II**) meaning dimension effects and (**III**) the derivation of the existence and direction of the bias:
- Current extension of Repp/Romero's VERUM/FALSUM approach
- Frana & Rawlins' (2019) presuppositional VERUM/FALSUM approach
- Goodhue (2022a) speech act approach

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APPENDIX

■ Update with Modal Centering (Murray 2010, 2014): Basics

- An **information state** (type <s,t>) is (the characteristics function of) a set of pairs < top sequence ⊤, bottom sequence ⊥>:

(82) { < < s, w_1, p_0> , <q, w_4> >,
< < s, w_1, p_0> , <q, w_5> >,
< < s, w_2, p_0> , <q, w_4> >, … }

- A **sequence** may contain objects of different types: individuals, worlds, propositions…
The most prominent (=leftmost) objects of each type are:
⊤δ / ⊥δ = most prominent individual ref in the current ⊤ /⊥ sequence.
⊤ω / ⊥ω = most prominent world in the current ⊤ /⊥ sequence.
⊤Ω / ⊥Ω = most prominent propositional ref in current ⊤ /⊥ sequence.
⊤ω‖ / ⊥ω‖ = set containing the most prominent world in each of the ⊤ /⊥ sequence in the current information state.

- **Top sequences** ⊤ represent the context set CS;
Bottom sequences ⊥ represent at-issue information.

- **At-issue** information is added to ⊥. If accepted, then it iss added to ⊤.
Not-at-issue information is added to ⊤ without going through ⊥.

- **Updates** are functions from info states to info states:

(83) a. [C] = $\lambda I_{<s,t>}.\lambda j_s.$ I(j) ∧ C(j)
b. [J; K] = $\lambda I_{<s,t>}.\lambda j_s.$ (K(J(I))(j)

■ Back to the Cheyenne DIRECT EVIDENTIAL:

(84) Initial context set p_0: $\{w_0, w_1, w_2\}$

(85) [Sandy won] DIR.

a. At-issue: q (= 'Sandy won') $\{w_1, w_2, w_3\}$

b. Non-at-issue: DIR(i,q) (= 'Speaker has direct evidence for q') $\{w_0, w_2, w_3\}$

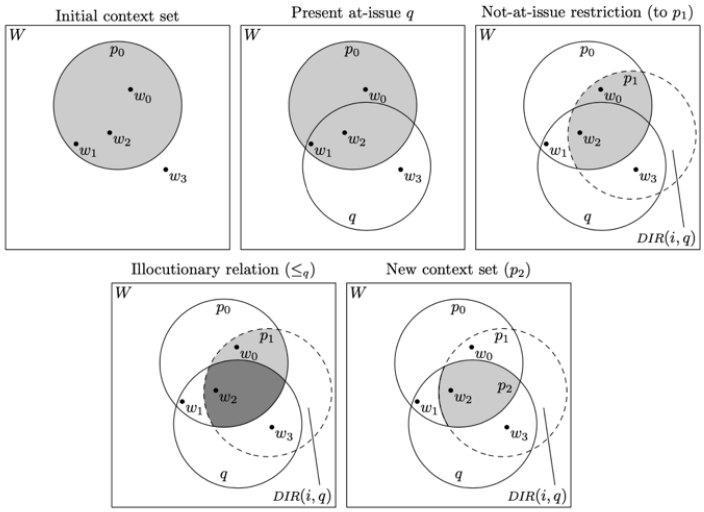


Figure 7 Updates for (26): Cheyenne direct evidential

(27) c1 c2 c3

$$\underbrace{{}^{\top}[x|\ x = \text{sandy}];[w|\ won_w\langle \top\delta\rangle];[p|\ p = \bot\omega\|];}_{\text{(present at-issue proposition } q\text{)}}$$

$$\underbrace{[\text{DIR}_{\top\omega}\langle i, \bot\Omega\rangle];}_{\text{(not-at-issue restriction)}} \quad \underbrace{[\bot\omega \in \top\omega\|];[\top\omega = \bot\omega];}_{\text{(illocutionary relation)}} \quad \underbrace{{}^{\top}[p|\ p = \top\omega\|]}_{\text{(new context set)}}$$

c4 c5 c6 c7

c_0	c_1	c_2	c_3
$\{\langle\langle w_0, p_0\rangle, \langle\rangle\rangle,$	$\{\langle\langle s, w_0, p_0\rangle, \langle\rangle\rangle,$	$\{\langle\langle s, w_0, p_0\rangle, \langle w_1\rangle\rangle,$	$\{\langle\langle s, w_0, p_0\rangle, \langle q, w_1\rangle\rangle,$
		$\langle\langle s, w_0, p_0\rangle, \langle w_2\rangle\rangle,$	$\langle\langle s, w_0, p_0\rangle, \langle q, w_2\rangle\rangle,$
		$\langle\langle s, w_0, p_0\rangle, \langle w_3\rangle\rangle,$	$\langle\langle s, w_0, p_0\rangle, \langle q, w_3\rangle\rangle,$
$\langle\langle w_1, p_0\rangle, \langle\rangle\rangle,$	$\langle\langle s, w_1, p_0\rangle, \langle\rangle\rangle,$	$\langle\langle s, w_1, p_0\rangle, \langle w_1\rangle\rangle,$	$\langle\langle s, w_1, p_0\rangle, \langle q, w_1\rangle\rangle,$
		$\langle\langle s, w_1, p_0\rangle, \langle w_2\rangle\rangle,$	$\langle\langle s, w_1, p_0\rangle, \langle q, w_2\rangle\rangle,$
		$\langle\langle s, w_1, p_0\rangle, \langle w_3\rangle\rangle,$	$\langle\langle s, w_1, p_0\rangle, \langle q, w_3\rangle\rangle,$
$\langle\langle w_2, p_0\rangle, \langle\rangle\rangle$	$\langle\langle s, w_2, p_0\rangle, \langle\rangle\rangle$	$\langle\langle s, w_2, p_0\rangle, \langle w_1\rangle\rangle,$	$\langle\langle s, w_2, p_0\rangle, \langle q, w_1\rangle\rangle,$
		$\langle\langle s, w_2, p_0\rangle, \langle w_2\rangle\rangle,$	$\langle\langle s, w_2, p_0\rangle, \langle q, w_2\rangle\rangle,$
$\}$	$\}$	$\langle\langle s, w_2, p_0\rangle, \langle w_3\rangle\rangle\}$	$\langle\langle s, w_2, p_0\rangle, \langle q, w_3\rangle\rangle\}$

Table 4 Information states for (27), part one

c_4	c_5	c_6	c_7
$\{\langle\langle s, w_0, p_0\rangle, \langle q, w_1\rangle\rangle,$	$\{$	$\{$	$\{$
$\langle\langle s, w_0, p_0\rangle, \langle q, w_2\rangle\rangle,$	$\langle\langle s, w_0, p_0\rangle, \langle q, w_2\rangle\rangle,$		
$\langle\langle s, w_0, p_0\rangle, \langle q, w_3\rangle\rangle,$			
$\langle\langle s, w_2, p_0\rangle, \langle q, w_1\rangle\rangle,$			
$\langle\langle s, w_2, p_0\rangle, \langle q, w_2\rangle\rangle,$	$\langle\langle s, w_2, p_0\rangle, \langle q, w_2\rangle\rangle$	$\langle\langle s, w_2, p_0\rangle, \langle q, w_2\rangle\rangle$	$\langle\langle p_2, s, w_2, p_0\rangle, \langle q, w_2\rangle\rangle$
$\langle\langle s, w_2, p_0\rangle, \langle q, w_3\rangle\rangle\}$	$\}$	$\}$	$\}$

Table 5 Information states for (27), part two

■ Back to the Cheyenne REPORTATIVE EVIDENTIAL:

(86) Initial context set p_0: $\{w_0, w_1, w_2\}$

(87) [Sandy won] RPT.

a. At-issue: ~~q (= 'Sandy won')~~ ~~$\{w_1, w_2, w_3\}$~~

b. Non-at-issue: RPT(i,q) (= 'Speaker has hearsay evi for q') $\{w_0, w_2, w_3\}$

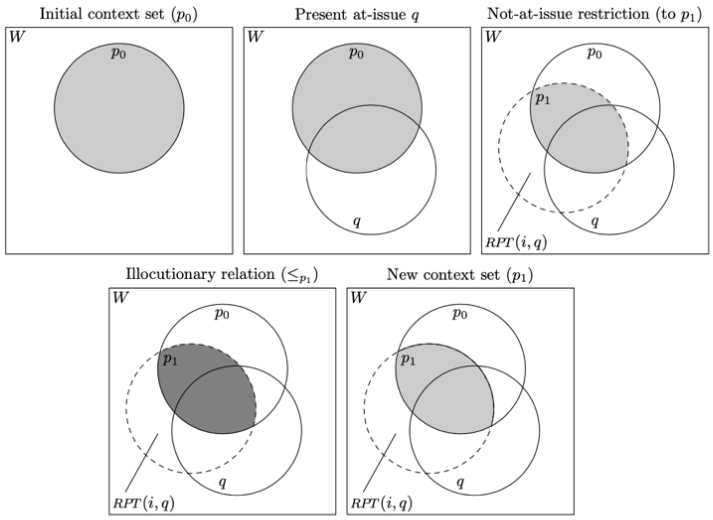


Figure 3 Updates for (14): Cheyenne reportative evidential

(32) $\underbrace{{}^{\top}[x|\ x = sandy];[w|\ won_w\langle\top\delta\rangle];[p|\ p = \bot\omega\|];}_{\text{(present at-issue proposition } q\text{)}}$ c4 $\underbrace{[RPT_{\top\omega}\langle i, \bot\Omega\rangle];}_{\text{(not-at-issue restriction)}}$

$\underbrace{[w|\ w = \top\omega];}_{\text{(RPT commitment)}}$ $\underbrace{[\bot\omega \in \top\omega\|];[\top\omega = \bot\omega];}_{\text{(illocutionary relation)}}$ $\underbrace{{}^{\top}[p|\ p = \top\omega\|]}_{\text{(new context set)}}$

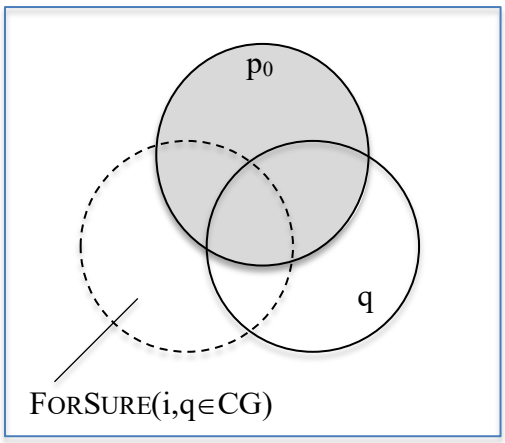
c5 c6

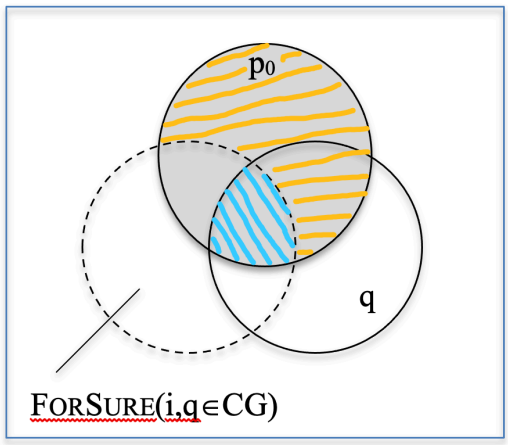
…	c4	c5	c6	…
	{ <<s,w_0,p_0>, <q,w_1>>, <<s,w_0,p_0>, <q,w_2>>, <<s,w_0,p_0>, <q,w_3>>, <<s,w_2,p_0>, <q,w_1>>, <<s,w_2,p_0>, <q,w_2>>, <<s,w_2,p_0>, <q,w_3>> }	{ <<s,w_0,p_0>, < w_0,q,w_1>>, <<s,w_0,p_0>, < w_0,q,w_2>>, <<s,w_0,p_0>, < w_0,q,w_3>>, <<s,w_2,p_0>, < w_2,q,w_1>>, <<s,w_2,p_0>, < w_2,q,w_2>>, <<s,w_2,p_0>, < w_2,q,w_3>> }	{ <<s,w_0,p_0>, < w_0,q,w_1>>, <<s,w_0,p_0>, < w_0,q,w_2>>, <<s,w_0,p_0>, < w_0,q,w_3>>, <<s,w_2,p_0>, < w_2,q,w_1>>, <<s,w_2,p_0>, < w_2,q,w_2>>, <<s,w_2,p_0>, < w_2,q,w_3>> }	

■ Proposal for *really*-PosQs:

(88) Initial context set p_0 = $\{w_1, w_2, w_5, w_6\}$
q (= Sandy won) = $\{w_4, w_5, w_6\}$
FORSURE(i,q∈CG)) = $\{w_2, w_6\}$

(89) a. Did Sandy really win?
b. LF: [Q [VERUM [Sandy won]]]
c. Partition:
{ info state with , info state with }
at-issue: q at-issue: ~~q~~ (/ ◇ q)
non-at-issue: FORSURE(i,q∈CG) non-at-issue: ¬FORSURE(i,q∈CG)





(90) ᵀ[x| x=sandy] ; [w| won$_w$<Tδ>] ; [p| p=⊥ω||] ;
[FORSURE$_{T\omega}$ (i, ⊥Ω ∈ CG)] ; c4
{ [⊥ω = ⊥ω] , ᵀ[w | w ∈ $\overline{T\omega||}$] ; [w | w = Tω] }
c5.i c5.ii c5.iii

… c4

{ <<s,w_2,p_0>, <q,w_4>>,
<<s,w_2,p_0>, <q,w_5>>,
<<s,w_2,p_0>, <q,w_6>>,
<<s,w_6,p_0>, <q,w_4>>,
<<s,w_6,p_0>, <q,w_5>>,
<<s,w_6,p_0>, <q,w_6>> }

c5 (i)

{ { <<s,w_2,p_0>, <q,w_4>>,
<<s,w_2,p_0>, <q,w_5>>,
<<s,w_2,p_0>, <q,w_6>>,
<<s,w_6,p_0>, <q,w_4>>,
<<s,w_6,p_0>, <q,w_5>>,
<<s,w_6,p_0>, <q,w_6>> }

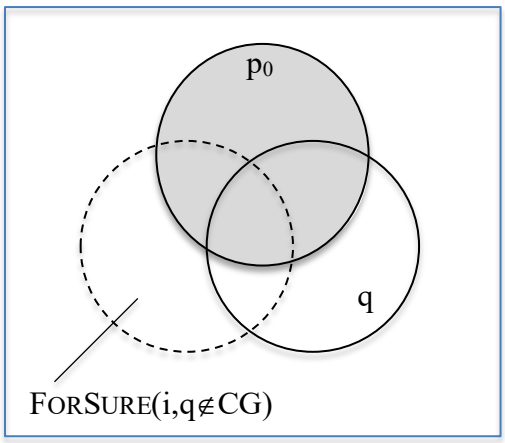
(ii) (iii)

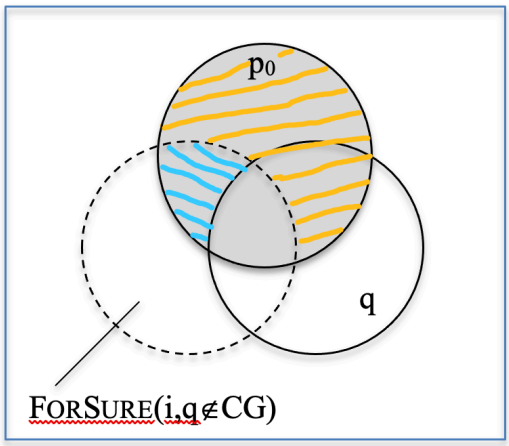
, { <<w_1,s,w_2,p_0>, <w_1,q,w_4>>,
<<w_5,s,w_2,p_0>, <w_5,q,w_4>>,
<<w_1,s,w_2,p_0>, <w_1,q,w_5>>,
<<w_5,s,w_2,p_0>, <w_5,q,w_5>>,
<<w_1,s,w_2,p_0>, <w_1,q,w_6>>,
<<w_5,s,w_2,p_0>, <w_5,q,w_6>>,
<<w_1,s,w_6,p_0>, <w_1,q,w_4>>,
<<w_5,s,w_6,p_0>, <w_5,q,w_4>>,
<<w_1,s,w_6,p_0>, <w_1,q,w_5>>,
<<w_5,s,w_6,p_0>, <w_5,q,w_5>>,
<<w_1,s,w_6,p_0>, <w_1,q,w_6>>,
<<w_5,s,w_6,p_0>, <w_5,q,w_6>>} }

■ Proposal for HiNQ with FALSUM:

(91) Initial context set p_0 = $\{w_1, w_2, w_5, w_6\}$
q (= Sandy won) = $\{w_4, w_5, w_6\}$
FORSURE(i,q∉CG)) = $\{w_2, w_6\}$

(92) a. Didn't Sandy win (too)?
b. LF: [Q [FALSUM [Sandy won]]]
c. Partition:
{ info state with at-issue: ¬q non-at-issue: FORSURE(i,q∉∉CG) , info state with at-issue: ~~¬q~~ (/ ◊¬q) non-at-issue: ¬FORSURE(i,q∉CG) }





(93) ᵀ[x| x=sandy] ; [w| won$_w$<Tδ>] ; [p| p=⊥ω||] ;
c4.i [w | w ∈ ⊥ω||] ; [FORSURE$_{T\omega}$ (i, ⊥Ω ∉ CG)] ; c4
{ [⊥ω = ⊥ω] , ᵀ[w | w ∈ Tω||] ; [w | w = Tω] }
c5.i c5.ii c5.iii

… c4 (i)

{ <<s,w2,p0>, <w1,q,w4>>,
<<s,w2,p0>, <w2,q,w4>>,
<<s,w2,p0>, <w3,q,w4>>,
<<s,w2,p0>, <w1,q,w5>>,
<<s,w2,p0>, <w2,q,w5>>,
<<s,w2,p0>, <w3,q,w5>>,
<<s,w2,p0>, <w1,q,w6>>,
<<s,w2,p0>, <w2,q,w6>>,
<<s,w2,p0>, <w3,q,w6>>,
<<s,w6,p0>, <w1,q,w4>>,
<<s,w6,p0>, <w2,q,w4>>,
<<s,w6,p0>, <w3,q,w4>>,
<<s,w6,p0>, <w1,q,w5>>,
<<s,w6,p0>, <w2,q,w5>>,
<<s,w6,p0>, <w3,q,w5>>,
<<s,w6,p0>, <w1,q,w6>>,
<<s,w6,p0>, <w2,q,w6>>,
<<s,w6,p0>, <w3,q,w6>> }

c5 (i)

{ { <<s,w2,p0>, <w1,q,w4>>,
<<s,w2,p0>, <w2,q,w4>>,
<<s,w2,p0>, <w3,q,w4>>,
<<s,w2,p0>, <w1,q,w5>>,
<<s,w2,p0>, <w2,q,w5>>,
<<s,w2,p0>, <w3,q,w5>>,
<<s,w2,p0>, <w1,q,w6>>,
<<s,w2,p0>, <w2,q,w6>>,
<<s,w2,p0>, <w3,q,w6>>,
<<s,w6,p0>, <w1,q,w4>>,
<<s,w6,p0>, <w2,q,w4>>,
<<s,w6,p0>, <w3,q,w4>>,
<<s,w6,p0>, <w1,q,w5>>,
<<s,w6,p0>, <w2,q,w5>>,
<<s,w6,p0>, <w3,q,w5>>,
<<s,w6,p0>, <w1,q,w6>>,
<<s,w6,p0>, <w2,q,w6>>,
<<s,w6,p0>, <w3,q,w6>>}

(ii) (iii)

, { <<w1,s,w2,p0>, <w1,w1,q,w4>>,
<<w5,s,w2,p0>, <w5,w1,q,w4>>,
<<w1,s,w2,p0>, <w1,w2,q,w4>>,
<<w5,s,w2,p0>, <w5,w2,q,w4>>,
<<w1,s,w2,p0>, <w1,w3,q,w4>>,
<<w5,s,w2,p0>, <w5,w3,q,w4>>,
<<w1,s,w2,p0>, <w1,w1,q,w5>>,
<<w5,s,w2,p0>, <w5,w1,q,w5>>,
<<w1,s,w2,p0>, <w1,w2,q,w5>>,
<<w5,s,w2,p0>, <w5,w2,q,w5>>,
<<w1,s,w2,p0>, <w1,w3,q,w5>>,
<<w5,s,w2,p0>, <w5,w3,q,w5>>,
…
…
…
… }