

Surprising

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1. Introduction

At least since Karttunen (1977), it is commonly assumed that emotive-factive predicates like *surprise* can embed Wh-interrogatives (1-a), but not polar interrogatives (1-b) or ‘alternative’ interrogatives (1-c). Karttunen (1977:5) observes that emotive-factives are an exception to the generalization that predicates that embed interrogatives in general embed every kind of interrogative. *Know, wonder, tell, and agree on* are unexceptional in this regard, (2-a,b,c,d).

- (1) a. It surprised Ali who called
b. *It surprised Ali whether Bob called
c. *It surprised Ali whether BOB or CAM called
- (2) a. Ali knew {who called, whether Bob called, whether BOB or CAM called}
b. Ali wondered {who called, whether Bob called, whether BOB or CAM called}
c. Ali told Dee {who called, whether Bob called, whether BOB or CAM called}
d. Ali and Dee agreed on {who called, whether Bob called, whether BOB or CAM called}

Why are emotive-factives exceptional? According to the grammatical accounts, emotive-factives have a grammatical representation that precludes embedded *whether*-interrogatives. According to the pragmatic accounts, emotive-factives are grammatically compatible with *whether* interrogatives but are judged unacceptable because their use systematically violates certain pragmatic principles.

This work focuses on *surprise* and expands on observations made by Sæbø (2007), showing that in some cases, emotive-factives are judged to be acceptable with embedded *whether*-interrogatives. The context-sensitivity of the judgments suggests that a pragmatic account of the judgments is preferable. This work argues for a modified version of an existing pragmatic account due to Guerzoni (2007).

2. New data

2.1. *Surprise + whether in the scope of quantifiers*

Surprise + whether is acceptable in the scope of quantifiers, e.g. *every* (a universal quantifier over individuals), *always*, and *want* (here taken to denote universal quantifiers over situations). In these quantificational examples, a condition on the acceptability of *surprise + whether* is that different answers be true for different individuals or situations in the domain of the quantifier. (3)-(5), which contain *surprise* with a polar interrogative under a quantifier, satisfy this condition¹.

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¹ Sæbø (2007:198) gives the following examples of *surprise at whether*. . . in the scope of *seldom, want, and would rather*. He suggests that the contexts in which these examples occur satisfy the conditions identified here.

- (i) a. Not that I was a boffin at psychometric testing, but we were seldom surprised at whether a person went to an Officer company or an NCO company.
b. Dont read this installment before seeing the episode if you want to be surprised at whether or not Hercules makes it.
c. I think we both feel this one will be a boy. But, we would rather be surprised whether it is a boy or not.

- (3) *Context: Half of the time, before Ali and Bob meet, Bob expects Ali to wear a hat and she doesn't; the other half, he expects her not to wear a hat and she does...*
It always surprises Bob whether Ali wears a hat
- (4) *Context: Half of the boys expected their mom to come pick them up, but she didn't; the rest expected their mom not to come pick them up, but she did...*
It surprised every boy whether his mom came to pick him up
- (5) *Context: Ali doesn't know or care whether the book she's reading has a happy ending. What she really loves is plot twists and surprises. Therefore...*
She wants it to surprise her whether the book has a happy ending

In (3), the answer to the *whether*-interrogative is sometimes that Ali wears a hat and other times that she doesn't. In (4), for some of the boys, the answer is that their mom came, and for others, that she didn't. In (5), in some situations compatible with Ali's desires, the book has a happy ending, and in others, it doesn't (i.e. she's indifferent about the ending). When the same answer is true throughout the domain of the embedding quantifier, *surprise whether* is judged unacceptable, shown in (6)-(8).

- (6) *Context: Before every meeting of theirs, Bob always expects Ali not to wear a hat, but she actually always does...*
a. #It always surprises Bob whether Ali wears a hat
b. cf. It always surprises Bob that Ali wears a hat
- (7) *Context: Every boy expected his mom to come pick him up, but she actually didn't...*
a. #It surprised every boy whether his mom came to pick him up
b. cf. It surprised every boy that his mom didn't come to pick him up
- (8) *Context: Ali doesn't know whether the book she's reading has a happy ending, but she wants it to have one. Furthermore, since she really loves plot twists and surprises...*
a. #She wants it to surprise her whether the book has a happy ending
b. cf. She wants it to surprise her that the book has a happy ending

The same judgments hold with 'alternative' interrogatives (the rest are omitted for space).

- (9) *Context: Half of the time, before Ali and Bob meet, Bob expects Ali to wear a beret and she wears a cap; the other half, he expects her to wear a cap and she wears a beret...*
It always surprises Bob whether Ali wears a BERET or a CAP
- (10) *Context: Before every meeting of theirs, Bob expects Ali to wear a beret, rather than a cap, but she actually always wears a cap...*
a. #It always surprises Bob whether Ali wears a BERET or a CAP
b. cf. It always surprises Bob that Ali wears a cap

2.2. Lack of knowledge

Surprise + whether is acceptable when the speaker does not know the answer to the embedded interrogative. (11) is an example with a polar interrogative.

- (11) *Context: In an experiment, Cam is asked to judge Bob's reaction as Bob is shown a picture of Ali. Before seeing the picture, Bob is either told that Ali is wearing a beret or told that she's not wearing a beret. Cam can't see the picture, nor does he know what Bob was told, but he knows that Bob has formed an expectation. Bob sees the picture and expresses surprise...*
Cam: It surprised Bob whether Ali was wearing a beret

(11) establishes that the Cam does not know the answer since he cannot see the picture. Additionally, Cam does not know which answer to the embedded interrogative Bob expected, since he does not hear what Bob was told. If Cam knows both of these things, then the embedded *whether*-interrogative is

unacceptable compared to a declarative, (12). To see that unacceptability is conditioned by ignorance of the answer (not of the experiencer's expectations), the reader can modulate what Cam sees and hears.

- (12) *Context: In an experiment, Cam is asked to judge Bob's reaction as Bob is shown a picture of Ali. Before seeing the picture, Bob is either told that Ali is wearing a beret or told that she's not wearing a beret. Cam can hear that Bob is told that Ali is not wearing a beret, which Cam takes to influence Bob's expectations about the picture. Bob and Cam both see the picture, showing Ali with a beret, and Bob expresses surprise...*
- a. Cam: #It surprised Bob whether Ali was wearing a beret
 - b. cf. Cam: It surprised Bob that Ali was wearing a beret

3. Previous accounts

Various accounts aim to rule out *surprise + whether*, some by grammatical constraints and others by systematic pragmatic reasoning. The grammatical accounts are either based on lexicalized selectional restrictions or semantic anomaly. Their spirit is incompatible with the context-sensitivity of the judgments. A modified version of an existing pragmatic account can explain the new judgments.

3.1. Grammatical accounts

Grimshaw (1979) explains Karttunen's judgments with the following assumptions: i) *surprise* selects semantically for exclamative complements, not questions; ii) often, a Wh-clause's syntactic form is the same as an exclamative's, making what looks like an embedded Wh-interrogative acceptable; and iii) *whether*-clauses are distinct from exclamatives in their form. Grimshaw's proposal that the complement of *surprise* must be an exclamative has been critiqued (e.g. Abels 2004); however, even if the particular selectional restriction associated with the lexical entry of *surprise* is modified, context is not expected to affect selectional restrictions. Hence, other selectional accounts are non-starters for explaining the observations made here (e.g. Guerzoni & Sharvit (2014: 220) on *surprise* selecting only questions marked with the [-WHETHER] feature).

Other grammatical accounts attribute the incompatibility of *surprise* with *whether*-interrogatives to semantic anomaly. Examples of such accounts are d'Avis 2002, Abels 2004, Nicolae 2013, and Romero 2015, most of which assign *surprise* a presupposition that is not satisfied when it embeds a *whether*-interrogative². For example, Nicolae (2013:151) suggests *surprise* might carry a presupposition that the answers to the interrogative it embeds are compatible. The possible answers to polar interrogatives are necessarily incompatible, and on the assumption that 'alternative' interrogatives carry a presupposition of exclusivity among their answers (cf. Biezma & Rawlins 2012 a.o.), then their answers are incompatible as well. Thus, Nicolae 2013 offers one way of explaining the traditional judgment.

The other analyses in this family differ in the particular way that they express the semantic incompatibility between *surprise* and embedded *whether*-interrogatives (e.g. Romero 2015 proposes that *surprise*, being gradable expressions, require a comparison class argument, and *whether*-interrogatives do not supply a comparison class of the right type); nonetheless, they are not well-suited to explain the context sensitivity of the judgments.

3.2. Pragmatic accounts

Existing pragmatic analyses of the judgments reported in Karttunen are due to Guerzoni (2007), Sæbø (2007), and Roelofsen et al. (2016). Guerzoni's and Sæbø's proposals are discussed together first, before turning to Roelofsen et al.'s. Among these proposals, Guerzoni's is most readily modified to explain the new judgments reported here.

Guerzoni 2007 and Sæbø 2007 independently claim that when *surprise* embeds an interrogative, the construction as a whole carries a presupposition that the speaker knows the answer. In other words,

² Abels 2004 suggests a non-presuppositional approach, which attributes the unacceptability of embedded polar interrogatives to a semantically-generated inference that the experiencer had inconsistent expectations. The critiques against the example analyses discussed here apply equally to his analysis, just in a different way.

surprise is ‘speaker-factive’. Next, both authors propose that *surprise* + *whether* pragmatically competes with alternatives containing declarative clauses denoting the individual possible answers to the *whether*-interrogative. This means that (13-a) competes with (13-b,c), for example.

- (13) a. It surprised Bob whether Ali wore a hat
 b. It surprised Bob that Ali wore a hat
 c. It surprised Bob that Ali didn’t wear a hat

Both authors propose analyses of the meaning of *surprise* that make (13-b,c) each logically entail (13-a). (13-a) means that the true answer to the embedded interrogative surprised Bob (without presupposing what the answer is), while (13-b,c) each presuppose that the proposition denoted by the declarative complement is true and assert that this proposition surprised Bob. Additionally, given the speaker-factivity associated with (13-a), whenever a speaker is in a position to utter (13-a), they are also in a position to utter one of (13-b,c). According to Sæbø, (13-a) always loses to one of (13-b,c) in an optimality-theoretic pragmatic competition. According to Guerzoni, using the *whether*-alternative produces ignorance implicatures that contradict an implication (inferred from the speaker’s assertion together with speaker-factivity) that the speaker knows which stronger alternative is true.

These analyses have previously been critiqued by works that assume that *surprise* + *whether* is to be ruled altogether, because, as these works showed, *surprise* is not reliably speaker-factive (a fact recognized by Guerzoni and Sæbø themselves). For example, Uegaki (2015:181) offers the example in (14), where the speaker admits ignorance of who passed the exam.

- (14) I dont know who passed the exam, but I know that it surprised John who passed the exam. So, there might be some interesting names on the list of students who passed.

However, in speaker-ignorance contexts, a *whether*-interrogative is judged acceptable, an implicit prediction of Guerzoni’s and Sæbø’s accounts. If speaker-factivity is removed from the meaning of *surprise*, then acceptability in these contexts follows. The challenge these accounts face is in explaining the opposite judgment from above that the embedded *whether*-interrogative is unacceptable when the context establishes speaker-knowledge, as in (15).

- (15) *Context: In an experiment, Cam is asked to judge Bob’s reaction as Bob is shown a picture of Ali. Before seeing the picture, Bob is either told that Ali is wearing a beret or told that she’s not wearing a beret. Cam can hear that Bob is told that Ali is not wearing a beret, which Cam takes to influence Bob’s expectations about the picture. Bob and Cam both see the picture, showing Ali with a beret, and Bob expresses surprise...*
- a. Cam: #It surprised Bob whether Ali was wearing a beret
 b. cf. Cam: It surprised Bob that Ali was wearing a beret

Since the context establishes that it is already known that Ali is wearing a beret in the picture, it turns out that Cam’s utterances in (15-a,b) are equally informative. (15-a) means that the true answer to whether Ali was wearing a beret surprised Bob, and the context supplies that the true answer is that Ali was wearing a beret, making (15-a) and (15-b) contextually equivalent. As such, Sæbø’s approach, which attributes unacceptability to unformativity, is not able to explain the contrast in acceptability.

The contrast between (16) and (17), which is conditioned by whether the same answer is true across the domain of the quantifier, is also difficult to explain under his account.

- (16) *Context: Half of the boys expected their mom to come pick them up, but she didn’t; the rest expected their mom not to come pick them up, but she did...*
- a. It surprised every boy whether his mom came to pick him up
 b. cf. #It surprised every boy that his mom came to pick him up
 c. cf. #It surprised every boy that his mom didn’t come to pick him up

- (17) *Context: Every boy expected his mom to come pick him up, but she actually didn't...*
- a. #It surprised every boy whether his mom came to pick him up
 - b. cf. It surprised every boy that his mom didn't come to pick him up

The judgments in (16) can be explained by assuming that (16-b,c) are alternatives to (16-a) and that they are not assertable given that context establishes that they are not defined (it's not the case that every boy's mom came to pick him up, nor that every boy's mom didn't come to pick him up, the presuppositions of each sentence respectively). (16-a) is acceptable because it is the most informative assertable alternative. In contrast, the unacceptability of (17-a) is unexpected on Sæbø's account; since the context provides that for every boy, his mom did not come to pick him up, (17-a,b) are both defined and equally informative in this context. The unacceptability of (17-a) cannot be attributed to unnecessary uninformativity.

Once speaker-factivity is removed from the grammatical meaning of *surprise*, Guerzoni's account can explain the unacceptability of (15-a) by assuming that its use triggers ignorance implicatures obligatorily, that these implicatures contradict contextual information, and that such a contradiction results in unacceptability. On the assumption that the ignorance implicature associated with the quantificational (16-a) is that neither of (16-b,c) is believed by the speaker, then the ignorance implicature does not contradict contextual information in (16) (nor in a context where the speaker does not know, for at least one boy, whether his mom picked him up), whereas it does in (17). Thus, on the assumption that ignorance implicatures are obligatory (cf. Sauerland 2004) and that a contradiction between ignorance implicatures and contextual information results in infelicity, Guerzoni's account explains the new observations made here.

Finally, Roelofsen et al. (2016)'s analysis also assumes pragmatic competition between *whether*-interrogatives and declaratives corresponding to the answers. Unlike the previous accounts, however, Roelofsen et al. attribute the traditional acceptability judgment to an unnecessary violation of Grice's Maxim of Manner. They assign a *surprise* + *whether* sentences the same meaning as a sentences with *surprise* and a declarative denoting the proposition that the *whether*-interrogative 'highlights' (the proposition that the interrogative brings to salience for subsequent propositional anaphora i.e. the root of the proto-question, in Karttunen's terms). The problem this approach faces in light of the new observations made here is that there are contexts where only an embedded *whether*-interrogative is acceptable and contexts where only the declarative corresponding to the predicted highlighted proposition is acceptable. (18) is an example.

- (18) *Context: Half of the time, before Ali and Bob meet, Bob expects Ali to wear a hat and she doesn't; the other half, he expects her not to wear a hat and she does...*
- a. It always surprises Bob whether Ali wears a hat
 - b. #It always surprises Bob that Ali wears a hat

The intuition is that (18-b) is unacceptable because it's not true that Ali always wears a hat, which appears to be entailed (in fact, presupposed) by (18-b) but not (18-a). Assigning them the same meaning, including the same presuppositions, as Roelofsen et al.'s analysis would imply, does not provide a way to explain the contrast.

4. Consequences and conclusions

Restrictions on *surprise* + *whether* appear to be pragmatic rather than grammatical, and the previous section showed how an existing pragmatic account might be extended to explain the new observations made here. A few more issues surrounding *surprise* are discussed briefly, along with a similar constraint on *know* + *whether*, before concluding.

Surprise as an interrogative-embedder has been claimed to differ from *know* not just in its incompatibility with *whether* but also in its lacking strongly-exhaustive readings (Berman 1991, Heim 1994, a.o.). A strongly-exhaustive reading for *surprise* would license the reportedly unattested inference in (19-a), which is more readily available for *know*, as in (19-b).

- (19) a. It surprised Ali who called
 ↗ It surprised Ali who didn't call
 b. Ali knows who called
 ~→ Ali knows who didn't call

Furthermore, based on contrasts like (20-a,b), Guerzoni & Sharvit 2007 claim that weak NPI-licensing in Wh-interrogatives correlates with the availability of strongly-exhaustive readings.

- (20) a. Ali knows which of her friends read any interesting books
 b. *It surprised Ali which of her friends read any interesting books

The issues of strongly-exhaustive readings and NPI-licensing are beyond the scope of this work, which is primarily an empirical exploration of *surprise* + *whether*. However, the question of whether *surprise* lacks strongly-exhaustive readings is not entirely closed. Cremers & Chemla 2017:§4 claim that experimental subjects accept (21) when presented with a visual depiction of the context, implying that they are understanding it in a strongly-exhaustive way.

- (21) *Visual context: Jacob expected a hand of cards that matched the one he eventually received, except that he got two spades where he expected clubs.*
 Jacob was surprised by which of his cards were clubs

Finally, it has been claimed that *know whether* sentences are unacceptable when the speaker knows the answer to the *whether*-interrogative (Eckardt 2007, Paillé & Schwarz 2018, a.o.). The dialog in (22), based on Eckardt 2007:448, shows this.

- (22) A: We can't meet on Monday because there will be a talk
 B: Ok, should I tell Elsie?
 A: No need. Elsie knows { #whether / that } there will be a talk

If the empirical conclusion of this work is correct – that *surprise* + *whether* is grammatical but subject to contextual acceptability constraints that also apply to *know* – then it remains to be determined why the out-of-the-blue judgment about *surprise* + *whether* (i.e. unacceptable) differs from the out-of-the-blue judgment about *know* + *whether* (i.e. acceptable).

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