Presupposition projection from the scope of *say*[1]

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Abstract. In this work, we investigate the projection behavior of presuppositions embedded under the predicate *say*. Drawing from new data elicited in French, German, Italian and English, we show that with *say* presuppositions from embedded declaratives and those from embedded interrogatives pattern in opposite ways. Specifically, presuppositions from declaratives must be satisfied at the attitude holder's level, in their 'presented beliefs', but not at the matrix level; from interrogatives, presuppositions project to the matrix level, but not the attitude holder's level. This result differs from the general pattern observed with responsive predicates. To capture this projection behavior, we propose a mechanism for declarative embedding that ensures for presuppositions to be satisfied in the same worlds at which the prejacent will be evaluated, here the attitude holder's presented beliefs. In addition, we assume that *say* cannot directly embed interrogatives, and instead, when it appears to embed a question Q, it is selecting for a silent DP 'the answer to Q'. Matrix projection follows on standard assumptions.

Keywords: say, presupposition, projection, French, German, Italian, English

1. Introduction

This paper is on the under-researched phenomenon of the projection behavior of presuppositions from the scope of *say*, a representative of the class of communication predicates.[2] Existing work on projection from under attitudes focuses on non-communication predicates, from which communication predicates, when mentioned, are explicitly set apart due to apparent differences in projection properties (Karttunen 1973, 1974; Geurts 1998; Uegaki 2021: a.o.). Pioneered by the work of Karttunen (1974) and Heim (1992), it is widely accepted that embedded presuppositions are filtered to the attitude holder's beliefs, at least. This appears to be true for both declarative embedding, as shown in (1), and interrogative embedding, as shown in (2). In (1) the uniqueness presupposition of a definite article gets anchored to the attitude holder's beliefs, and in (2), the uniqueness presupposition coming with the *which*-question filters to the beliefs of the attitude holder.[3]

(1) Zoe is certain that the cat is inside.
Presupposes: Zoe believes that there is a unique cat and it is compatible with Zoe's beliefs that it is inside.

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[2]The class of communication predicates includes *say*, *tell*, *show*, *indicate*, *inform*, *disclose* (Karttunen 1977).
[3]In this paper, we set aside the proviso problem, which is the observation that embedded presuppositions appear to project by default to the matrix level. When we present the crucial data, we use contexts that are meant to bring out projection to the attitude holder's beliefs only, i.e., those in which the context would explicitly contradict matrix projection in an appropriate way.

(2) Zoe is certain (about) which cat is inside.
Presupposes: Zoe believes that exactly one cat is inside.

Uegaki (2021) generalizes this observation, claiming that presuppositions (including the existence and uniqueness presuppositions triggered by a *wh*-word) from under responsive predicates project in the same way from declaratives and interrogatives: to the attitude holder's beliefs only, in the case of non-veridical predicates, or additionally to the matrix evaluation world, for veridical predicates.

In this paper, we make two main novel empirical claims. First, we show that presuppositions from declaratives embedded under *say* must be satisfied not in the attitude holder's belief worlds, but instead in the worlds compatible with what they say, which correspond to what we dub their 'presented beliefs', i.e., the reported common ground according to the attitude holder's goals (following a characterization of the semantics of *say* by Anand and Hacquard 2014). Second, we reveal a surprising generalization, where presuppositions project in opposite ways from embedded declaratives and interrogatives, posing a challenge to Uegaki's generalization: presuppositions from declaratives must be satisfied at the attitude holder's level, in their 'presented beliefs', but not at the matrix level; from interrogatives, presuppositions project to the matrix level, but not the attitude holder's level. To back these claims, we use data from different languages (French, German, Italian, English), which all exhibit the same behavior, tentatively suggesting a hypothesis that these properties are cross-linguistically stable.

We propose an analysis which captures this projection behavior. First, we propose a mechanism for declarative embedding that ensures for presuppositions to be satisfied in the same worlds at which the prejacent will be evaluated, here the attitude holder's presented beliefs. Second, we assume that *say* cannot directly embed interrogatives, and instead, when it appears to embed Q, it selects for a silent DP 'the answer to Q'. Matrix projection follows on standard assumptions.

The remainder of the paper is organized as follows. Section 2 discusses previous work on communication predicates. Section 3 and 4 present how presuppositions project from under *say* when it embeds declaratives and interrogatives. Section 5 shows how *say* differs from non-communication responsive predicates in its projection behavior. In Section 6, we propose an analysis of *say* which captures its projection behavior before concluding in Section 7.

2. Previous work on presupposition projection from under communication predicates

Presupposition projection from clauses embedded under communication predicates has been subject to debate in the literature. There is no agreement yet on (i) whether communication predicates allow presuppositions to project from their complement and (ii) if they do, what the resulting content of these presuppositions is.

Karttunen (1973) attributes to communication predicates the label of presupposition plugs. Presupposition plugs are known to block all the presuppositions of their complement. Based on examples (3) and (4) which involve the definite article and *again* as presupposition triggers, Karttunen (1973) claims that "one can report a certain illocutionary act has taken place without committing themselves to the presuppositions of whatever was said on that occasion." In other words, neither the presupposition triggered by the definite article nor the presupposition triggered by *again* is presupposed at the matrix level in (3) and (4).

(3) a. Harry has promised Bill to introduce him to the present king of France. (Karttunen 1973: 174)
b. *Does not presuppose:* The king of France exists.

(4) a. Cecilia asked Fred to kiss her again.
b. *Does not presuppose:* Fred had kissed Cecilia before.

The claim that communication predicates are presupposition plugs is challenged by Permesly (1973) who shows that presuppositions can project from under communication predicates when they embed an interrogative.[4] In particular, Permesly (1973) claims that when the predicate *tell* embeds a *wh*-question the existential presupposition coming with that question projects all the way to the matrix level, as shown in (5).

(5) a. John told us who Bill had an argument with. (Permesly 1973: 60)
b. *Presupposes:* Bill had an argument with someone.

Permesly (1973) thus shows that presuppositions do not project the same way from under embedded declaratives and interrogatives. Following Karttunen's (1973) terminology, this suggests that when communication predicates like *tell* embed a declarative, they can be characterized as plugs, but when they embed an interrogative, they should be characterized as holes.

In recent work, Spector and Egré (2015) and Uegaki (2015) challenge Karttunen's (1973) and Permesly's (1973) respective claims that presuppositions don't project from embedded declaratives, but project all the way to the matrix level when they come from an embedded interrogative. Specifically, they argue that communication predicates like *tell* are ambiguous between a veridical and a non-veridical version (in contrast to Karttunen 1977 and Groenendijk and Stokhof 1984, a.o., who consider that they are veridical). When veridical *tell* is used, presuppositions project both from embedded declaratives and interrogatives. In contrast, when non-veridical *tell* is used, nothing projects no matter what kind of clause is embedded. To illustrate, let us start with veridical *tell*. When veridical *tell* embeds a declarative, as in (6), a veridical inference (i.e., that the complement 'Fred is the culprit.' is true) arises when the sentences are used out of the blue. That this inference is preserved under negation and in polar questions suggests that it is some kind of presupposition.

(6) a. Sue told Jack that Fred is the culprit. (Spector and Egré 2015: 1739)
b. Sue didn't tell that Fred is the culprit.
c. Did Sue tell Jack that Fred is the culprit?

To confirm that this veridical inference is in fact a factive presupposition, Spector and Egré (2015) show that the above sentences pass the *Wait a Minute Test* (von Fintel 2004).

(7) A: Sue told Jack that Fred is the culprit. (Spector and Egré 2015: 1739)
B: Hey wait a minute! I didn't know that Fred is the culprit.

(8) A: Sue didn't tell Jack that Fred is the culprit.
B: Hey wait a minute! I didn't know that Fred is the culprit.

[4]Permesly (1973) characterizes communication predicates like *tell*, *say*, *state* and *teach* as *wh-factives* but claims that it is the existential presupposition that comes with the embedded questions that projects, and not some kind of factive presupposition as one may expect given the name.

(9) A: Did Sue tell Jack that Fred is the culprit?
B: Hey wait a minute! I didn't know that Fred is the culprit.

Based on these examples, Spector and Egré (2015) and Uegaki (2015) conclude that veridical *tell* comes with a factive presupposition that projects all the way to the matrix level with embedded declaratives. As for interrogatives embedded under veridical *tell*, example (10) suggests that they come with the veridical inference that John told the true answer to the question 'Who is the culprit?'. Uegaki (2015) further claims that when veridical *tell* is used, the existential presupposition coming with the embedded question, i.e., there is someone who is the culprit in (10), projects to the matrix level as well.

(10) Jack told Mary who the culprit is. (Spector and Egré 2015: 1737)

Moving on to non-veridical *tell*, Spector and Egré (2015) and Uegaki (2015) claim that no veridical inference arises no matter what kind of clause is embedded, a declarative or an interrogative. Example (11) shows that in the case of embedded declaratives, what is told does not necessarily have to be true as indicated by the continuation *but he was lying*. As for embedded interrogatives, they do not come with the veridical inference that the attitude holder told the true answer to the embedded question. For instance, as shown in (12), it is felicitous to add the continuation that the attitude holder (i.e., the meteorologists) is wrong.

(11) John told Mary that Zoe passed the test, but he was lying.

(12) Every day, the meteorologists tell the population where it will rain the following day, but they are often wrong. (Spector and Egré 2015:1737)

Uegaki (2015) adds that just like veridical inferences do not arise with non-veridical *tell*, other kinds of presuppositions are not present at the matrix level either. This claim is based on example (13) where the existential presupposition coming with the embedded question, i.e., 'Some students passed the test.', is negated in the preceding context.

(13) Unfortunately, none of our students passed the test, but John is mistaken that Ann and Bill did. To make matters worse, John told Mary which students passed the test (although he was of course wrong). (Uegaki 2015: 132)

As noted by Uegaki (2015), the judgment for (13) is subtle. In addition, although the existential presupposition coming with the embedded question may not be part of the common ground, the sentence involving *tell* still presupposes that the attitude holder (i.e., John) believes that some students passed the test, suggesting that some projection is taking place.

Most of the examples discussed in this section involve the predicate *tell*. One question that arises is whether all communication predicates trigger the same presuppositions and share the same projection properties. Spector and Egré (2015) mention that it may not be the case – specifically, *say* seems to differ from *tell* in this respect. In contrast to the sentences involving (veridical) *tell* in (6), no veridical inference arises when the following sentences are uttered out of the blue. And in contexts in which Sue is well-informed, although (14a) may suggest that Fred is the culprit, (14b) clearly does not. This suggests that unlike veridical *tell*, *say* does not come with a factive presupposition.

(14) a. Sue said that Fred is the culprit. (Spector and Egré 2015: 1739)

b. Sue didn't say that Fred is the culprit.
c. Did Sue say that Fred is the culprit?

To summarize, previous literature does not settle on what the empirical facts are. Specifically, no agreement has been reached yet regarding (i) the presuppositions that may come with communication predicates and (ii) the projection behavior of these predicates. The current paper aims at contributing to (ii) by investigating the projection properties of the predicate *say* in four languages, French, German, Italian and English. Specifically, we looked at whether presuppositions triggered within the complement of *say* project and if so how (to the attitude holder level only, to the matrix level only, or both). We considered two kinds of complements, declaratives, to which we turn next, and interrogatives (Section 4).

3. Presupposition projection from embedded declaratives

In this section, we show that when *say* embeds a declarative, presuppositions triggered within the embedded clause need not project to the speaker's beliefs. Instead, they project into what we dub the attitude holder's 'presented beliefs', which depend on the attitude holder's intentions at the speech act reported. The presuppositions project (i) to the attitude holder's actual belief state, if they are being truthful; (ii) to a fake belief state of the attitude holder, if they are lying.

To start with, we look at the most common case, namely contexts in which the speaker believes the attitude holder to be truthful. In the first scenario in (15), the speaker – in contrast with the attitude holder – does not believe the presupposition coming with the embedded clause. The presupposition trigger *aussi* 'also' triggers the presupposition that someone other than Zoé has bought milk (in the following example, the prejacent is not believed by the speaker either; the judgment stays the same if the speaker believes it, unsurprisingly). The relevant presupposition trigger is marked in bold, as it will be throughout.

(15) *Max thinks Lou bought a bottle of milk, but I don't think she did. Then he sees another one, and thinks that Zoé bought it, even though I don't think that can be the case either.*
Max me dit que Zoé **aussi** a acheté du lait.
Max me says that Zoé also has bought of.the milk
'Max says to me that Zoé **also** bought some milk.'

That the sentence involving *say* is felicitous in (15) shows that the presupposition triggered by *aussi* can project to the attitude holder's beliefs only. The speaker does not need to share this belief that someone other than Zoé has bought milk. We will be making our empirical observations using French examples in the main text, but the corresponding English translations make the same point, as do counterparts in German and Italian, which we include in the appendix which can be found on osf.io/ywt83.

Let us now turn to a second scenario where the speaker but not the attitude holder believes the presupposition triggered by *aussi*, i.e., someone other than Max has bought milk in (16). That the sentence involving *say* is not felicitous in such a scenario shows that the presupposition coming with the complement of *say* cannot project to the speaker's beliefs only. In other words, the attitude holder must believe the presupposition for the sentence to be felicitously uttered.

(16) *I bought some milk this morning. As I open the fridge I see that Max also bought some. Max didn't see the milk I bought, and thinks he's the only one who bought milk.*

#Il va voir Zoé et il lui dit que lui **aussi** a acheté du lait.
he goes see Zoe and he her says that he also has bought of.the milk
'He goes to Zoe and he says to her that he **also** bought milk.'

Examples (15) and (16) thus show that in declarative-embedding cases where the attitude holder speaks their mind, the presupposition coming with the complement of *say* must project to their belief worlds. As previously mentioned, with *say* the attitude holder need not to tell the truth, which appears to disrupt projection to their actual beliefs (as in examples from Karttunen 1977; Spector and Egré 2015; Uegaki 2015: a.o.). Instead, we show that in such cases presuppositions triggered within an embedded declarative project to the attitude holder's fake beliefs, namely those that the attitude holder wants their addressee to believe about their beliefs. To see this, let us consider (17) which again involves the presupposition trigger *aussi*. In this example, neither the attitude holder nor the speaker believe the embedded presupposition (i.e., someone other than Zoé has bought milk), but crucially the attitude holder wants their addressee to believe that they believe it.

(17) *When I left my apartment this morning, there was no milk left in the fridge. Max, as always, has decided to lie, and tells me he bought milk. But he doesn't stop lying there:*
Max me dit que Zoé **aussi** a acheté du lait.
Max me says that Zoé also has bought of.the milk
'Max says to me that Zoé **also** bought some milk.'

The sentence involving *say* is felicitous in (17), which suggests that the presupposition coming with the embedded clause can project to the attitude holder's fake beliefs, and does not need to project to the speaker's beliefs, confirming what we have shown in (15) and (16), nor does it not need to project to the attitude holder's actual beliefs.

To show that projection is not random, we show that presuppositions must project to the attitude holder's fake beliefs, and not their actual beliefs, when they are lying. In the scenario in (18), the at-issue content of the prejacent of *say* is satisfied in the attitude holder's fake belief worlds, but the presupposition is satisfied in their actual belief worlds (in addition to the speaker's). This mismatch makes the sentence infelicitous, showing that indeed, presuppositions from declaratives embedded under *say* must always be satisfied in the same worlds that the prejacent is evaluated at, i.e. the 'presented beliefs' at the speech act reported.

(18) *Max bought a bottle of milk, but he lies and says he didn't, and instead blames Zoé.*
#Max me dit que Zoé **aussi** a acheté du lait.
Max me says that Zoé also has bought of.the milk
'Max says to me that Zoé **also** bought some milk.'

To sum up, we have shown in this section that when *say* embeds a declarative, the presupposition coming with its complement is anchored to the attitude holder's presented beliefs, i.e., either to the attitude holder's actual beliefs in honest speech reports, or to the attitude holder's fake beliefs in dishonest speech reports. This projection pattern is robust and observed in controlled contexts across the four languages we have investigated, namely, French, English, German and Italian, and across embedded declaratives involving other strong presupposition triggers like clefts (see appendix for remaining data). As a result, we have rejected a characterization of *say* as a presupposition plug (cf. Karttunen 1974). We have further shown that in contrast to what has been claimed for *tell* (Spector and Egré 2015; Uegaki 2015), some kind

of projection always takes place with *say* even in its non-veridical use, i.e., when the attitude holder doesn't tell the truth. Before turning to embedded interrogatives, we note that we can find cases with some presupposition triggers in which there is apparent projection of the presupposition up to the speaker's beliefs only (and not to attitude holder's beliefs) in declaratives. In (19), the attitude holder – in contrast to the speaker Max – doesn't believe the presupposition that Max and Theo have a cat. Nevertheless, the sentence involving *say* is felicitous.

(19) *Zoe comes to my house not knowing that Max and Theo have a cat. She sees it as she comes up to the door.*
Zoe to Max: I saw a white cat outside! Do you have cats?
Max to Theo: Zoe says she saw **our** cat!

We follow Heim (1992) in claiming that these cases are simply taken to be *de re* readings of the presupposition triggers. A paraphrase of (19) would be: 'As for our cat, Zoe says she saw it.' We therefore exclude these from consideration, as these presupposition triggers are to be interpreted outside the scope of *say*.

4. Presupposition projection from embedded interrogatives

When *say* embeds an interrogative, we show that presuppositions project from them differently than from embedded declaratives. Specifically, they must be included in the speaker's beliefs, but not necessarily the attitude holder's presented beliefs. In this section, we discuss on the one hand polar questions embedding strong presupposition triggers like *aussi* 'also', and on the other hand embedded *wh*-questions and their associated existential presupposition. As far as we know, the literature on communication predicates has focused on embedded *wh*-questions. Extending our investigations to polar questions allows us to check whether different types of questions behave alike when it comes to presupposition projection from the scope of *say*.

Let us start with embedded polar questions. In the first scenario (20), the honest attitude holder believes the presupposition coming with the embedded clause (i.e., someone other than Zoé bought some milk), but not the speaker. The sentence involving *say* is not felicitous in such a scenario, which shows that the presupposition coming with the complement of *say* cannot project to the attitude holder's beliefs only. The speaker must believe the presupposition for the sentence to be felicitously uttered.

(20) *Max thinks Lou bought a bottle of milk, but I don't think she did. I think that only Zoé bought some. I will ask Max about it.*
#Max me dira si Zoé **aussi** a acheté du lait.
Max me say.FUT if Zoé also has bought of.the milk
#'Max will say to me whether Zoé **also** bought some milk.'

In contrast, when the speaker believes the presupposition triggered by *aussi*, but the honest attitude holder does not, the sentence involving *say* is felicitous.

(21) *I bought a bottle of milk this morning, but I didn't tell Max yet. As I open the fridge I see that someone else bought one. I suspect Zoé did. I will ask Max about it, because he stays at home all day and witnesses all comings and goings.*
Max me dira si Zoé **aussi** a acheté du lait.
Max me say.FUT if Zoé also has bought of.the milk

'Max will say to me whether Zoé **also** bought some milk.'

This example shows that the presupposition coming with the complement of *say* can project to the speaker's beliefs only. The attitude holder does not need to share the belief that someone other than Zoé bought milk. This is the exact opposite of what we observed with declaratives.[5]

We observe the same projection pattern when *say* embeds a *wh*-question. Specifically, the existential presupposition coming with the embedded *wh*-question (i.e., someone bought milk) cannot be anchored to the beliefs of the (honest) attitude holder only, as shown by the oddness of (22a). In (22b), we reject the possibility that the oddness comes from a potential veridical use of *say*. In (23), we show that the same presupposition can project to the speaker's beliefs only.

(22) *When I left my apartment this morning, there was no milk left in the fridge. Unlike Max, I think that no-one bought milk. He tries to convince me, and*
a. #il me dit **qui** en a acheté.
he me says who of.it has bought
'he says to me **who** bought some.
b. il me dit que Zoé en a acheté.
he me says that Zoé some has bought
'he says to me that Zoé bought some.'

(23) *Lou and I have seen in the fridge that someone bought a bottle of milk. Lou went to ask Max about what he knows of this, but Max was away and doesn't know that anyone bought milk, so what's for sure is that*
Max ne lui dira pas **qui** a acheté du lait.
Max NE her say.FUT not who has bought of.the milk
'Max will not say to her **who** bought milk.'

Note that we used negated *say* to construct the example in (23). The reason to do so was because the existential presupposition of a *wh*-question is entailed by an answer to that question. This means that it is not possible to construct a sentence 'Max says who bought milk', where Max

[5]We used the future in these examples to construct natural-sounding examples with embedded polar questions (in the past or present, there needs to be a reason for why the speaker is not directly reporting the answer to the question as an embedded declarative; the context becomes very heavy if it is included). However, it is important to check that doing so does not affect projection properties overall. Below, we show controls with declaratives embedded under future *say*, and show that the generalization found in the previous section is not affected. (i) shows that it is possible for the honest attitude holder to believe the presupposition (that someone else than Zoé bought milk), and not the speaker, while (ii) is odd, because in the context, the speaker but not the honest attitude holder believes the presupposition.

(i) *There are two new bottles of milk in the fridge, I think only one person bought them, but Max thinks that Lou and someone else did. Zoé says she bought some milk, but doesn't say how many bottles. Then Lou asks Max about it.*
Max lui dira que Zoé **aussi** a acheté du lait.
Max to.her say.FUT that Zoé also has bought of.the milk
'Max will say to her that Zoé **also** bought some milk.'

(ii) *I bought a bottle of milk this morning, but I didn't tell Max yet. He instead thinks that Zoé bought it. When I ask him,*
#Max me dira que Zoé **aussi** a acheté du lait.
Max me say.FUT that Zoé also has bought of.the milk
#'Max will say to me that Zoé **also** bought some milk.'

presents the belief that X bought milk (an answer to 'who bought milk') without presenting the belief that someone bought milk. When *say* is negated, it is unclear what the definition of presented beliefs is, because there is no speech act to anchor them to. We therefore check the attitude holder's actual beliefs.[6]

To sum up, we have shown in this section that when *say* embeds an interrogative, the presupposition coming with its complement projects to the speaker's beliefs, and not to the attitude holder's presented beliefs. This projection pattern is robust and has been observed in controlled contexts for several presupposition triggers and across several types of embedded interrogatives, namely strong presupposition triggers (*also* and clefts) in polar questions, and the existence presupposition associated with *wh*-questions, in French, English, German and Italian. Our result is novel. It is partially in line with Permesly's (1973) claim about *tell*, where presuppositions must project to the matrix level. It is however in contradiction with Spector and Egré (2015) and Uegaki (2015), who argued that no presupposition is present at the matrix level with non-veridical *tell*. One possibility for this is that *tell* is different from *say*. But we propose to challenge their empirical claims (thus maintaining Permesly's original claim). First, we disagree with the data point (12) from Uegaki (2015). As for the example in (13) from Spector and Egré (2015), we note that involves both universal quantification and a future modal, which might muddy the judgments, a point which calls for future investigation.[7] These disagreements highlight the fact that these judgments are subtle and should be handled with care. Checking across more types of contexts, and perhaps in an experimental setting could be beneficial to confirm and refine (or reject) our result.

We have thus shown that with *say* presuppositions from embedded declaratives and those from embedded interrogatives do not pattern in the same way, and in fact, pattern in opposite ways. This result differs from the general pattern observed with responsive predicates, which we present in the next section.

5. Presupposition projection from responsive attitude predicates

The standard view on presupposition projection from the scope of attitude predicates is based on the seminal works by Karttunen (1974) and Heim (1992). Specifically, when a predicate embeds a presupposition trigger, the presupposition of the embedded clause gets filtered to the attitude holder beliefs, or additionally to the common ground, in the case of factive predi-

[6]For a full characterization of the semantics of *say* and its projection properties, we need to see what happens when *say* is embedded under other operators like negation. For reasons of space, we do not provide the full picture in this paper. However, we still need to check that negation does not affect projection properties for declaratives: (i) shows that for declaratives under negated *say*, in the case where the honest attitude holder does not believe the presupposition, but the speaker does, the sentence is odd, as we showed it is under non-negated *say* in Section 3.

(i) *I bought a bottle of milk this morning. Then, Lou and I see in the fridge that someone bought another bottle. We suspect Zoé did. Lou went to ask Max about what he knows of this, but Max was away and doesn't know that anyone bought milk, so what's for sure is that*
#Max ne lui dira pas que Zoé **aussi** a acheté du lait.
Max NE her say.FUT not that Zoé also has bought of.the milk
#'Max will not say to her that Zoé **also** bought milk.'

[7]In particular, under a particular modal semantics of *will*, one could read "the metereologists told us where it will rain" as "the metereologists told us where it is predicted to rain", which allows for the existential presupposition of *where* to project to the matrix level, even when the prediction is wrong.

cates. Building on this line of work, Uegaki (2021) proposes the following generalization about presupposition projection from under attitude responsive predicates.

(24) **Generalization about responsive predicates (Uegaki 2021):**
Presuppositions project from embedded declaratives in the same way that the existential presupposition does from embedded interrogatives, and presupposition triggers embedded therein.

This generalization is based on examples like (25) and (26). Under factive predicates such as *know*, the factive presupposition as well as any other presupposition of the embedded clause (e.g., the uniqueness presupposition triggered by the definite article in (25)) project both into the beliefs of the attitude holder and the speaker. This is the case whether the predicate embeds a declarative, as in (25a), or an interrogative, as in (25b) (examples adapted from Uegaki 2021).

(25) a. Max knows that the unicorn danced.
Presupposes: There is a unique unicorn & it danced & Max believes that there is a unique unicorn.
b. Max knows who caught the unicorn.
Presupposes: There is a unique unicorn & someone caught it & Max believes that there is a unique unicorn.

Under non-veridical predicates, embedded presuppositions project into the beliefs of the attitude holder, and not into the speaker's beliefs, as illustrated in (26). Again, presuppositions project the same way with embedded declaratives (26a) and embedded interrogatives (26b) (examples adapted from Uegaki 2021).

(26) a. Max is certain that the unicorn danced.
Presupposes: Max believes there is a unique unicorn & it is compatible with Max's beliefs that it danced.
b. Max is certain (about) who caught the unicorn.
Presupposes: Max believes that there is a unique unicorn.

In this paper, we have shown that *say* does not fit into this generalization, because presuppositions do not project the same way from embedded declaratives and embedded interrogatives. Specifically, when *say* embeds a declarative, the presuppositions are anchored to the presented beliefs of the attitude holder. When it embeds an interrogative, the presuppositions project to the speaker's beliefs. One may be inclined to conclude that *say* behaves similarly to *be certain* when it embeds declaratives and similarly to *know* when it embeds interrogatives. However, there are several differences between these predicates worth keeping in mind. First, just like *tell* and unlike *know*, *say* is not veridical when it embeds a question (see Tsohatzidis 1993, 1997, Uegaki 2015, on *tell* and Spector and Egré 2015), as shown below for French *dire* and English *say*.

(27) a. Zoé m'a dit qui elle a vu dans le brouillard. Mais il s'est avéré
Zoe me=has said who she has seen in the fog but it REFL=is turn.out
qu'elle s'est trompée.
that-she REFL=is mistaken
'Zoe said to me whom she saw in the fog. But it turned out that she was mistaken.'

b. Zoé sait qui elle a vu dans le brouillard. #Mais il s'avère
Zoe knows who she has seen in the fog but it REFL=turn.out
qu'elle se trompe.
that-she REFL is.mistaken
'Zoe knows who she saw in the fog. #But it turns out that she is mistaken.'

Second, when presuppositions project from the scope of *say*, they are not anchored to the attitude holder's actual beliefs, but to their presented beliefs, i.e., the reported common ground according to their goals. Therefore, an analysis of *say* based on the assumption that *say* behaves similarly to *be certain* when it embeds declaratives and similarly to *know* when it embeds interrogatives is not desirable.
The next section introduces our proposal for *say* which takes into account these differences with responsive attitude predicates and captures the peculiar projection behavior of *say*.

6. Analysis

Our analysis needs to capture the following: a) the at-issue content of a proposition embedded under *say*, be it a declarative or an answer to an interrogative, is evaluated at the attitude holder's presented beliefs; b) the presuppositions of an embedded declarative project into the attitude holder's presented beliefs; c) the presuppositions of an embedded interrogative project into the common ground, and not the attitude holder's presented beliefs.

We propose that the surprising projection behavior of presuppositions under *say* follows from *say*'s underlying c-selectional restrictions: it can select for declarative CPs, but not for interrogative CPs, at least not directly. We propose that apparent interrogative embedding under *say* is in fact DP embedding, where there is a silent definite noun phrase 'the answer to'. Furthermore, we argue that presuppositions project differently from CPs and DPs from *say* and across predicates, based on arguments from the literature and new empirical observations. We then propose a novel analysis of this difference in projection that assigns to the *that* complementizer the burden of redefining definedness conditions, which, we claim, captures the facts across attitude predicates, and challenges the Karttunen-Heim generalization of a uniform projection pattern to the attitude holder's beliefs. In contrast, since the attitude predicates themselves are not specified for any special projection behavior, the presuppositions of a DP complement project to the matrix level, and not the attitude holder's.

6.1. *Say*'s core semantics: evaluating the prejacent to the presented beliefs

Our first desideratum for the semantics of *say* is to capture the projection behavior of presuppositions embedded in declaratives into the attitude holder's 'presented beliefs', instead of the attitude holder's real beliefs, as is standardly assumed for attitude predicates.

When an agent *says* something, that something is generally a proposal by an apparently truthful speaker to add it to the beliefs of the hearer. This uttered proposition often ends up in the actual common ground (actual shared beliefs between speaker and addressee), but it need not: the speaker may be deceitful and utter a proposition they believe to be false but want the hearer to believe, or the hearer may not accept the proposition into their beliefs. What is common across these situations is that the speaker wants the hearer to add the uttered proposition to what the hearer believes is the common ground. We encode this property in the semantics of

say, following Anand and Hacquard (2014) on assertive predicates, by requiring the prejacent proposition to hold in the worlds of the 'reported common ground' (CG_R) according to the goals of the attitude holder, that is 'in the worlds of the context set that match the goals of the discourse move event' (Anand and Hacquard 2014: p.77).

(28) $[\![\text{say}]\!] = \lambda p.\lambda e.say(e) \wedge \forall w' \in Goal(e)[CG_R(w') \subseteq p]$

We call the 'reported common ground according to the goals of the attitude holder' the attitude holder's 'presented beliefs', following the terminology from Section 3.

6.2. Projection from declaratives vs. interrogatives: Wrong results with Uegaki's procedure

We show that a standard approach to handling presupposition filtering, coupled with composition path proposed by Uegaki (2021) to capture presupposition projection for responsive predicates, does not produce the right result.

In the Karttunen-Heim tradition (Karttunen 1974; Heim 1992), attitude verbs provide their own definedness conditions, where the presuppositions of the embedded declarative are generally to be evaluated at the attitude holder's beliefs. We can propose something similar for *say*, where it is defined if the presuppositions of the proposition it selects are satisfied in the attitude holder's presented beliefs, as shown below.

(29) $[\![\text{say}]\!](p)(e)$ is defined if $\forall w' \in Goal(e)[CG_R(w') \subseteq \pi(p)]$

These definedness conditions capture the empirical distribution from Section 3: if the attitude holder is truthful, their actual beliefs are a subset of their presented beliefs, and therefore the presuppositions of the prejacent must hold in the attitude holder's actual belief worlds. If the attitude holder is lying, then the presuppositions project not into their actual beliefs, but into their fake beliefs, those they want their addressee to believe are their actual beliefs.

As discussed in Section 5, according to Uegaki's generalization, we should expect presuppositions from interrogatives embedded under *say* to behave like those from declaratives. And indeed, from a semantic point of view, there is nothing obvious that should block that type of behavior: *say wh-* could easily be a speech report of saying the answer to a *wh-* question that belongs to the speaker's presented beliefs. Here we show that if we follow Uegaki's procedure, based on Spector and Egré (2015), to derive the definedness conditions of interrogatives embedded under a responsive predicate, this is what we wrongly obtain.

(30) The lexical rule generating question-embedding predicates (Uegaki 2021):
$V_{int}(Q,x,w)$
   a. true iff $\exists w'[V_{decl}(\text{EXH}_Q(\text{ANS}_{w'}(Q)))(x)(w)$ is defined $\wedge V_{decl}(\text{ANS}_{w'}(Q))(x)(w)]$
   b. defined iff $\exists w'[V_{decl}(\text{EXH}_Q(\text{ANS}_{w'}(Q)))(x)(w)]$ is defined

Where:

(31) a. $\text{ANS}_w := \lambda Q : \exists p \in Q[p = \text{MAX}_{inf}(Q,w)].\text{MAX}_{inf}(Q,w)$ (Dayal 1996)
   b. $\text{MAX}_{inf}(Q,w) := p$ iff $w \in p \wedge \forall q \in Q[w \in q \rightarrow p \subseteq q]$
   c. $\text{EXH}_Q(p) := \lambda w.[\text{ANS}_w(Q) = p]$ (Spector and Egré 2015)

ANS carries the presupposition that there is a maximally informative true answer in the set of propositions it combines with, and picks out such a maximally informative true answer. EXH

ensures that that answer is strongly exhaustive.

Since *say* appears to be a responsive predicate, i.e., it is able to embed declaratives and interrogatives, we can use the rule in (30) to derive interrogative semantics for *say* from the semantics we proposed for declarative-embedding *say* in the previous section. We apply the rule for definedness in (30b) for *say* (adapting it to match our event semantics for *say*).

(32) a. $say_{int}(Q)(e)$ defined iff $\exists w'[say_{decl}(\textsc{Exh}_Q(\textsc{Ans}_{w'}(Q)))(e)]$ is defined
b. $\exists w'[say_{decl}(\textsc{Exh}_Q(\textsc{Ans}_{w'}(Q)))(e)]$ is defined iff
$\exists w'.\forall w \in Goal(e)[CG_R(w) \subseteq \pi(\textsc{Exh}_Q(\textsc{Ans}_{w'}(Q)))]$ (from (29))

We get that *x say Q* is defined iff the presuppositions of the (strongly exhaustive) answer to Q are in *x*'s presented set. This derives what Uegaki's generalization suggests, i.e., that the presuppositions of the question should project in the same way as the presupposition of the declarative. But it is not what we actually observe in the data, where it appears that presuppositions from embedded interrogatives project to the matrix level, and not the attitude holder's.

6.3. Solution: *say* can't select for questions, only DPs embedding questions

Our proposal for matrix projection of interrogatives will rely on the stipulation that *say* cannot select for interrogatives directly. Instead, it can embed DPs (as can be seen with overt examples in (34) and (35)), which allows for apparent question embedding via a silent question-embedding noun, forming a definite DP of the type 'the answer to', as shown in (33).

(33) Max said <*the answer to*> who came.

This proposal is largely a stipulation.[8] It can find support in similar proposals in the literature that argue for a silent DP layer in some instances of declarative clausal complementation (Moulton 2009; Kastner 2015; Özyıldız 2017; Bochnak and Hanink 2022; Bondarenko 2020, 2022); this proposal would be an interrogative version of this type of theory. Furthermore, these cited works argue that the presence of a DP layer affects semantic properties of clausal embedding. For instance, when looking at a variety of declarative CPs, Kastner (2015) argues that the complements of factive attitudes have a definite DP-like behavior, while complements of non-factives don't necessarily. This leads him to propose that while sometimes similar on the surface, these factive and non-factive complements come in different sizes, where factive complements come with an overt or covert D head that merges with the CP complement, and carries a presupposition that the prejacent refers to a discourse referent in the common ground. Work on factivity alternations of predicates which have factive and non-factive uses argues that they are dependent on complement type (with varying proposals for the actual mechanism): English (Moulton 2009), Washo (Hanink and Bochnak 2017), Turkish (Özyıldız 2017), Barguzin Buryat (Bondarenko 2020).

In this context, one could say that *say* exhibits alternation, not in its factivity (i.e. whether the prejacent needs to be satisfied at the matrix evaluation world), but in its presupposition projection behavior (i.e. whether the prejacent's presuppositions are satisfied at the matrix

[8] In future work, we hope to derive this property in a principled way. Indeed, if *say*'s projection facts hold across languages, this should be a desideratum for the theory. Furthermore, if this selectional restriction is indeed present for *say* cross-linguistically, it begs the question: are other responsive predicates also underlyingly responsive? If not, can we capture the projection behavior differently?

evaluation world). The explanation will be of a similar tone as the ones given for factivity alternative, namely where differences in projection behavior do come not from the semantics of the attitude itself, but as a result of complement type.

In most of this literature, it is only implicitly assumed that presuppositions of the definite DP must project to the matrix level, despite this property being central to some of these proposals. Here, we provide actual evidence to back this assumption, by presenting data with overt DPs embedded under *say*. We can show that the presuppositions of these DPs project to the matrix level, in (34)–(35)— data is given for French, replicated for English in the translations.

(34) *Zoé thinks that Jean has a dog (he doesn't); she tells me this.*
   a. #Elle m' a dit le nom du chien de Jean.
      she 1SG AUX said the name of.the dog of Jean
      #'She said the name of Jean's dog.' $\rightsquigarrow$ *Jean has a dog.*
   b. Elle m' a dit que le nom du chien de Jean est Paul.
      she 1SG AUX said that the name of.the dog of Jean is Paul
      'She said that the name of Jean's dog is Paul.' $\not\rightsquigarrow$ *Jean has a dog.*

(35) *Zoé hears that Jean asks her if Max is married, and she answers. But she misheard, Jean didn't ask anything, he just stated that Max is married.*
   a. #Elle a dit la réponse à la question de Jean.
      she AUX said the answer to the question of jean
      #'She said the answer to Jean's question.' $\rightsquigarrow$ *There is a question by Jean.*
   b. Elle a dit que la réponse à la question de Jean est oui.
      she AUX said that the answer to the question of Jean is yes
      'She said that the answer to J.'s question is yes.' $\not\rightsquigarrow$ *There is a question by Jean.*

Furthermore, we show that this pattern can also be found under *believe* and *explain*.

(36) a. *John thinks it rained, but it didn't.*
      #He believed the fact that it rained. $\rightsquigarrow$ *(There is a fact that) it rained.*
   b. *Mary asked whether it rained. John thought she claimed that it rained.*
      ??John believed the claim that it rained. $\rightsquigarrow$ *There is a claim that it rained.*
   c. *Sue thinks that France has two capitals.*
      (i) Sue thinks that both capitals of France were destroyed.
      (ii) Sue explained that both capitals of France were destroyed.
      (iii)??Sue explained the destruction of both capitals of France.

This data shows that the presuppositions of DP complements project to the matrix level, differently than those of CP complements, which as we saw project to the attitude holder's presented beliefs, in the case of *say*, and their actual beliefs for non-communication attitudes. While a contrast between declaratives and interrogatives would be surprising in light of the typology captured by Uegaki's generalization, a contrast between CPs and DPs is not, as we show here.

6.4. Compositional analysis

Next, we give a compositional analysis that derives the contrast in projection behavior between CP and DP embedding, which can be summarized below.

(37) a. $[\![\text{say CP}]\!](e)$ is defined iff $\forall w' \in \mathit{Goal}(e)[CG_R(w') \subseteq \pi([\![\text{CP}]\!])]$

b. $[\![\text{say DP}]\!](e)$ is defined iff $\pi([\![\text{DP}]\!])$ is true

As reflected in (37), we base our analysis in an event-based framework where attitudes do not select a proposition, but can only combine with one if it type-shifts into a predicate of contentful individuals (Moltmann 1989; Kratzer 2006; Moulton 2009; Elliott 2016, 2020: a.o.). Specifically, we will adopt the framework proposed by Elliott (2016, 2020), where events and individuals are entities, of the same semantic type e, and attitudes, like other verbs, are predicates of events/entities. An event x, in this framework, can have propositional content $\textsc{Cont}(x)$.

In order to combine with an attitude predicate, a proposition must first type-shift to a predicate of (contentful) entities. Predicate modification can then apply. We propose that *say* itself does not provide new definedness conditions; instead, the operator responsible for the proposition-to-entity type-shift also introduces new definedness conditions, which make the presuppositions of declaratives project to the set of worlds associated with the contentful event, rather than the speaker's beliefs. Thus, if the content of the event is true in all the presented beliefs, then the presuppositions must also be. This captures what happens when *say* embeds declaratives.

As for interrogatives, we assume that questions cannot count as content as they are non-propositional, therefore no type-shifting operator is available to allow them to combine with attitudes. Instead, they must combine with content nouns that embed questions, such as *answer*, as argued in Section 6.3. These then combine through a DP layer as a complement to *say*. These elements do not affect the definedness conditions, which results in matrix projection.

6.4.1. *Say* as a predicate of contentful entities

We modify the semantics of *say* proposed by Anand and Hacquard (2014), in (28), into a predicate of events, to fit Elliott's framework.[9]

(38) $[\![\text{say}]\!] = \lambda e_e.say(e) \wedge \forall w' \in Goal(e)[CG_R(w') \subseteq \textsc{Cont}(e)]$

Note that this lexical entry is only defined when the content of e is propositional. However, it is conceivable that one can say something non-propositional, e.g. 'say a name'. So speakable content has a wider range than, for instance, thinkable content, which arguably can only be propositional. For the sake of simplicity, we restrict our attention to saying events with propositional content; refining it to reflect the general use of *say* is beyond our current scope.

6.4.2. Declarative embedding

We assume a covert type-shifter F_{cont} (as in Hanink and Bochnak 2017; Elliott 2020; Bochnak and Hanink 2022), which selects for propositions (sets of worlds, of type st) to predicates of (contentful) entities, of type et.

(39) $[\![F_{cont}]\!] = \lambda p_{st}.\lambda e_e.\textsc{Cont}(e) = p$

Our lexical entry for *say* in (38) cannot directly compose with propositions. However, it can compose via Predicate Modification with a proposition that has previously combined with the type-shifter F_{cont}, which results in a predicate of contentful entities.

[9]This semantics should be intensional. We ignore the world arguments on predicates for the sake of clarity, as they don't play a role in our derivations.

(40) a. $[\![F_{cont}]\!]([\![\text{that the box fell}]\!]) = \lambda e.\textsc{Cont}(e) = \{w : \text{the box fell in } w\}$
b. $[\![\text{say } F_{cont} \text{ that the box fell}]\!] = \lambda e.say(e) \wedge \forall w' \in Goal(e)[CG_R(w') \subseteq \textsc{Cont}(e) \wedge \textsc{Cont}(e) = \{w : \text{the box fell in } w\}]$

The denotation of F_{cont} on its own does not say anything about definedness conditions. By default, we might assume that it is a hole, and that a type-shifted proposition is defined whenever the presuppositions of its prejacent are true in the world of evaluation. We propose instead that the presuppositions of the prejacent must only be met at those worlds supplied by the content entity, as in (41).

(41) $[\![F_{cont}]\!] = \lambda p_{st}.\lambda e_e.\textsc{Cont}(e) = p$ defined iff $\textsc{Cont}(e) \subseteq \pi(p)$

We further propose that *say* does not introduce its own definedness conditions. We obtain the desired result in (42). The presuppositions of the prejacent of *say* must be satisfied, as dictated by F_{cont}, in the worlds provided by the content of the event, which must itself be satisfied in the presented belief worlds, as dictated by the semantics of *say*.

(42) $[\![\text{say } F_{cont} \text{ p}]\!] = \lambda e.say(e) \wedge \textsc{Cont}(e) = p \wedge \forall w' \in Goal(e)[CG_R(w') \subseteq \textsc{Cont}(e)]$
defined iff $\textsc{Cont}(e) \subseteq \pi(p) \Rightarrow$ defined iff $\forall w' \in Goal(e)[CG_R(w') \subseteq \pi(p)]$

An advantage of this proposal is that it makes correct predictions for doxastic attitude verbs. If we take F_{cont} to be responsible for declarative embedding in general, and attitudes to be underspecified for definedness conditions, we predict that the presuppositions of the declarative are evaluated at the same set of worlds in which the prejacent itself is evaluated. This is what we observe, at least, for belief predicates: *believe* asserts that its prejacent is true at all belief worlds, and is defined when the presuppositions of the prejacent are true in those belief worlds.

(43) $[\![\text{believe } F_{cont} \text{ p}]\!] = \lambda e.believe(e) \wedge Bel(e) \subseteq \textsc{Cont}(e) \wedge \textsc{Cont}(e) = p$
defined iff $\textsc{Cont}(e) \subseteq \pi(p) \Rightarrow$ defined iff $Bel(e) \subseteq \pi(p)$

In the Karttunen-Heim conception, presuppositions from non-communication attitude verbs, including of belief and desire, project to the attitude holder's beliefs. In our system, the predictions are more nuanced and dependent on the specific semantics of the attitude. We leave testing the predictions of our system across attitude predicates for further investigation.

6.4.3. Interrogative embedding through DPs

We now show how we obtain matrix projection when *say* combines with interrogatives via a content noun. Following Elliott (2016, 2020), we take content DPs to be definite descriptions of content entities. In particular, *answer* is a content noun, that we define as a function taking a question and returning a property of entities whose content is the maximally true answer to Q (essentially integrating Dayal's answerhood operator into the semantics of 'answer').

(44) a. $[\![\text{the answer to Q}]\!]^w = \iota x[\textsc{Cont}(x) = \textsc{Max}_{inf}(Q, w)]$
b. defined iff $\exists!x.\textsc{Cont}(x) = \textsc{Max}_{inf}(Q, w)$
c. defined iff Q is defined

The word *answer* does not redefine definedness conditions, and thus the presuppositions of $[\![\text{the answer to Q}]\!]$ are the same as those of $[\![\text{Q}]\!]$. Now we see what happens when it further composes. The type of a definite content DP like (44a) allows it to combine with *say* via function application, with the result shown in (45).

(45) (first attempt) $[\![\text{say the answer to Q}]\!]^w = say(\iota x_e[\textsc{Cont}(x) = \textsc{Max}_{inf}(Q,w)]) \wedge \forall w' \in Goal(\iota x[\textsc{Cont}(x) = \textsc{Max}_{inf}(Q,w)])[CG_R(w') \subseteq \iota x[\textsc{Cont}(x) = \textsc{Max}_{inf}(Q,w)]]$

However, this composition is problematic because the attitude holder, which later enters the derivation as a predicate of events, cannot compose with this expression. We follow Elliott (2016) in assuming that the content DPs can only compose with a verb via a thematic argument head F_{int}, whose semantics (here for *say*) is as follows in (46a). It first composes with *say*, creating a thematic argument slot, which then can compose with the DP.

(46) a. $[\![F_{int}]\!] = \lambda f_{et}.\lambda x_e.\lambda e_e.[\textsc{Cont}(e) = \textsc{Cont}(x)] \wedge f(e)$

b. $[\![F_{int}\ \text{say}]\!] = \lambda x.\lambda e.[\textsc{Cont}(e) = \textsc{Cont}(x)] \wedge say(e) \wedge \forall w' \in Goal(e)[CG_R(w') \subseteq \textsc{Cont}(e)]$

c. $[\![[F_{int}\ \text{say}]\ \text{the answer to Q}]\!]^w =$
$\lambda e.[\textsc{Cont}(e) = \textsc{Cont}(\iota x[\textsc{Cont}(x) = \textsc{Max}_{inf}(Q,w)])]$
$\wedge say(e) \wedge \forall w' \in Goal(e)[CG_R(w') \subseteq \textsc{Cont}(e)]$

The presuppositions of 'the answer to Q' project all the way up. As we defined it, *say* does not redefine definedness conditions, nor does F_{int}, therefore 'say the answer to Q' is defined whenever Q is defined. In contrast, there is no requirement for the presuppositions to be satisfied in the attitude holder's presented beliefs. Finally, while the presuppositions of the embedded interrogative must project to the matrix level, the answer need not be true in the matrix evaluation world, as has been observed in the literature (Tsohatzidis 1993; Spector and Egré 2015). It simply predicts the answer must be true in the presented beliefs of the attitude holder.

One may be skeptical of the seemingly ad hoc difference between F_{int} and F_{cont} in how presuppositions are filtered. However, one can argue that it is not arbitrary: the projection properties of F_{cont} follow from a standard universal projection rule for presuppositions in the scope of a universal quantifier (Heim 1983). We can rewrite F_{cont} as a universal quantifier as in (47).

(47) $F_{cont} = \lambda p.\lambda e.\forall w \in \textsc{Cont}(e).p(w)$ defined iff $\forall w \in \textsc{Cont}(e).\pi(p)(w)$

However, we cannot apply the same projection rule for F_{int}, because the nuclear scope of the universal quantification, $\textsc{Cont}(x)$, is not itself an argument of F_{int}, which means that its presuppositions would be undefined if we extended the rule to this case. Thus, any presupposition filtering rule for F_{int} would be stipulative.[10]

7. Conclusion

This paper provides a novel characterization of presupposition projection from the scope of *say*, which has received little attention in the literature. It reveals on the one hand that presuppositions from declaratives are filtered to the attitude holder's presented beliefs, i.e., the reported common ground according to the attitude holder's goals (following the characterization by Anand and Hacquard 2014). On the other hand, presuppositions from interrogatives project to the speaker's beliefs, and not necessarily to the attitude holder's beliefs. This contrast in projection behavior between declaratives and interrogatives is unexpected given a generalization proposed by Uegaki (2021), according to which presuppositions embedded under responsive

[10] Another solution would be to embed this analysis in a framework of clausal embedding that does not need F_{int}, such as the one proposed by Kratzer (2006) and Moulton (2009), where *say* is a transitive predicate, selecting both for a contentful individual and an event (which in such a framework are of different types).

predicates project into the same set of worlds regardless of complement type.

We propose to explain away this apparent exception to the generalization by arguing that interrogative complements can combine with *say* only through a definite description containing a question embedding content noun such as 'answer'. Now, the difference in presupposition projection is no longer unexpected from a typological point of view. We show data with overt definite DPs that reveals this presupposition projection behavior, which corrobates observations and claims made in the literature showing that the presuppositions associated with DP complements project to the matrix level. In particular, this has been argued to underlie factivity inferences for predicates exhibiting factivity alternations, as well as a more general observation that factive and non-factive predicates combine with different types of complements, where the former takes CP embedding DPs, headed by a silent definite D head.

We propose an analysis where *say*, like other attitudes, is a predicate of contentful entities. It combines with propositions via a type-shifter that turns propositions into predicates of contentful entities, and is defined whenever the presuppositions of the propositions are true in the worlds associated with the contentful entity. This makes presuppositions of embedded declaratives project to the worlds at which the prejacent is evaluated. For *say*, this is the presented beliefs. In contrast, when *say* combines with a DP, the presuppositions of the DP project to the matrix level, because *say* does not provide any non-default definedness conditions, and the word *answer* doesn't either. This analysis has wider-ranging consequences on the theory of presupposition filtering. We depart from the traditional Karttunen-Heim conception that presuppositions from under attitudes project to the attitude holder's beliefs, except for verbs of saying, which are noted by Karttunen to be plugs, without receiving much further attention. Instead, presuppositions must project to the set of worlds at which the embedded proposition is evaluated: the attitude holder's beliefs for doxastic predicates, the attitude holder's presented beliefs for verbs of saying, and, possibly, so on.

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