Decomposing universal projection in questions[1]

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Abstract. Revising a proposal by Guerzoni (2003), we propose to derive universal projection of presuppositions in wh-questions, where attested, from a family of three felicity conditions on question use. Assuming that these felicity conditions can be violated under certain conditions, this proposal predicts a typology of contexts where universal projection can exceptionally be unattested. We propose that this prediction is correct, presenting a family of scenarios where the expected absence of universal projection is observed.

Keywords: wh-questions, universal presupposition projection, felicity conditions, bridge principles.

1. Introduction

Presuppositions have been said to project universally from under wh-phrases in wh-questions (e.g., Schlenker 2008, 2009; Abrusán 2011, 2014; Nicolae 2015). We can state this generalization as in (1), where π maps an expression to its presuppositional content, and R and S are the wh-phrase's property denoting restrictor and scope, respectively.

(1) **universal projection generalization**
$\pi(\text{wh R S}) = \lambda w.\ \forall x[[\![R]\!](x)(w) \rightarrow \pi(S)(x)(w)]$

For example, as stated in (3), R in (2) expresses the property of being one of those ten boys, and due to the factivity of *regret*, π(S) is the property of having been invited by Bill. According to the generalization in (1), then, (2) presupposes that Bill invited each of those ten boys.

(2) Who [$_{R}$ among those ten boys] [$_{S}$ does Mary regret that Bill invited __]?

(3) a. $[\![R]\!](x)(w) \Leftrightarrow$ x is one of those ten boys
b. $\pi(S)(x)(w) \Leftrightarrow$ Bill invited x in w

We will review two existing approaches to the presupposition projection behaviour of unembedded wh-questions: the *local context* approach, due to Schlenker (2008, 2009), and the *pragmatic bridge* approach, due to Guerzoni (2003). Under the local context approach, the same calculus drives projection from under wh-phrases that also drives projection from under universals and other quantificational phrases in declaratives. The pragmatic bridge approach, in contrast, divorces projection in wh-questions from projection from under quantificational phrases in declaratives, and instead credits presupposition projection in wh-questions to pragmatic con-

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straints on the use of questions.

We will propose a development of Guerzoni's (2003) pragmatic bridge approach by positing a family of three pragmatic bridge principles. We propose that this development is motivated by certain instances of non-universal projection in wh-questions, which do not seem to have been observed previously. We propose that non-projection in those cases can be understood in terms of the suspendability of the pragmatic principles that we posit.

2. Two approaches to presupposition projection in wh-questions

2.1. Local context account

Schlenker (2008, 2009) assumes that presuppositions project universally both from under quantificational determiner phrases and from under wh-phrases. For example, consider (4) on a reading where *him* is anaphoric to the matrix subject; under Schlenker's assumption, this example, like (1) above, presupposes that Bill invited each of those ten boys.

(4) None [$_R$ of those ten boys] [$_S$ regrets that Bill invited him].

Schlenker proposes a calculus that indeed applies to (1) and (4) in the same way. Here we sketch Schlenker's (2009) rendition of the proposal, which we dub the *local context* account. The account requires, in a nutshell, that a presupposition be entailed by its so-called local context. With S understood as above, the local context is the strongest property P such that restricting S with P is globally vacuous in the context set (in the sense of Stalnaker 1978), i.e., does not alter the interpretation of the structure as a whole relative to the context set. In cases like (1) and (4), the local context is as shown in (5), the conjunction of the context set c with the restrictor property, i.e., the property given by R.

(5) **local context**
$\lambda x.\lambda w.\ c(w) \wedge [\![R]\!](x)(w)$

The fact that the local context of S in both (1) and (4) entails the restrictor property is due to the fact that both *no* and *wh* participate in an inferential pattern known as *conservativity* (Barwise and Cooper 1981; Keenan and Stavi 1986): both of the equivalences in (6) are supported by intuitions, as exemplified by the intuited equivalences stated in (7).[2]

(6) **conservativity**
a. $no\ R\ S \equiv no\ R\ R{\wedge}S$
b. $wh\ R\ S \equiv wh\ R\ R{\wedge}S$

[2] We extrapolate slightly from Schlenker's (2009) brief discussion of wh-questions, which does not explicate the role of conservativity in the wh-question case.

(7) a. No boy complained ≡ No boy is a boy who complained
b. Which boy complained? ≡ Which boy is a boy who complained?

As detailed in Schlenker (2009), given conservativity, the requirement that the local context entail π(S) in cases like (1) and (4) derives universal projection as a pragmatic condition (Stalnaker 1973). It does this in virtue of deriving (8), requiring that the universal presupposition be entailed by the context set.

(8) **universal projection derived**
$[\![\text{no R S}]\!]/[\![\text{wh R S}]\!]$ is felicitous in c only if
$c \subseteq \{w: \forall x[[\![R]\!](x)(w) \rightarrow \pi(S)(x)(w)]\}$

As intended, this derives parallel universal projection from under quantificational determiners like *no* (Schlenker 2008, 2009; Chemla 2009), and for wh-questions (Schlenker 2008, 2009; Abrusán 2011, 2014; Nicolae 2015).

2.2. A pragmatic bridge approach

The second approach to presupposition projection in wh-questions exploits natural conditions on the felicitous use of (unembedded) questions. Guerzoni (2003: p. 50, 91) proposes a felicity condition worded as in (9).

(9) **question bridge principle**
A question is felicitous ONLY IF it can be felicitously answered (i.e. only in contexts where at least one answer is defined)

It will be useful to spell out this principle in some greater detail, under Guerzoni's own assumptions about presuppositions and the semantics of questions, listed in (10).

(10) a. **Frege-Strawson view of presupposition**
$\pi(\phi) = \text{dom}([\![\phi]\!])$
b. **Stalnaker's assertion bridge principle**
ϕ is felicitous in c only if $c \subseteq \text{dom}([\![\phi]\!])$
c. **Hamblin-Karttunen semantics**
$[\![\text{wh R S}]\!] = \lambda w.\{[\![S]\!](x) \mid [\![R]\!](x)(w)\}$

As stated in (10a), the proposed elaboration assumes, in the Frege-Strawson tradition, that the semantic presupposition carried by a sentence is encoded as a definedness condition: construing propositions as functions from possible worlds to truth values, the presupposition is given by the set of possible worlds that serves as that function's domain; (10a) feeds the bridge principle for assertions in (10b), due to Stalnaker (1973): for an assertion to be felicitous, the domain of the relevant proposition must be entailed by the context set; (10c) states the familiar Hamblin-Karttunen semantics for wh-questions (Hamblin 1973; Karttunen 1977).

Given these assumptions, and pretending for ease of exposition that Stalnaker's assertion bridge principle exhausts the felicity conditions on assertions, we can reconstruct Guerzoni's question bridge principle as in (11), requiring that in some context set world, the question extension contain a Hamblin-Karttunen answer whose domain is entailed by the context set.

(11) **question bridge principle**
Q is felicitous in c only if
$\exists$w,p[w$\in$c $\wedge$ p$\in$Q(w) $\wedge$ c$\subseteq$dom(p)]

We will start evaluating Guerzoni's account in the next subsection, in the context of a preliminary comparison of the two approaches.

2.3. Preliminary comparison of the approaches

We submit that both approaches reviewed above have considerable conceptual appeal. The local context approach is attractive in virtue of it providing a general and predictive account of presupposition projection. The assumptions about conservativity it relies on are independently established and hence do not incur any theoretical cost. The pragmatic bridge account, too, we take to enjoy independent conceptual motivation. The question bridge principle is surely a condition that is expected to be observed at least in prototypical uses of questions. After all, it seems plausible that a question that necessarily lacks any felicitous answer fails to serve a proper purpose in conversation and is therefore itself infelicitous. To this rationale, we add that the question bridge principle is a central (implicit or explicit) ingredient of existing analyses of certain island effects in wh-questions (Oshima 2007; Simonenko 2016; Schwarz and Simonenko 2016), which therefore provide potential independent motivation.

However, as developed so far, the two approaches are not on a par with regard to empirical predictions. The difference that is the most relevant in the present context, and perhaps also the most obvious, is that the Schlenker's account derives universal projection in wh-questions while Guerzoni's merely derives existential projection. For example, Guerzoni's account merely predicts (2) to presuppose that Bill invited some of those ten boys, not that he invited each of them. As matters stand, then, to the extent that the universal projection generalization for wh-questions is correct, the local context account emerges as the more adequate of the two.

We will argue below that the universal projection generalization is in fact less robust than it has been made out to be. We will then formulate a version of the pragmatic bridge account in terms of a family of three felicity condition on questions that does derive universal projection. We further propose that the violability of those principles predicts a typology of non-universal projection cases that is indeed attested.

3. A first case of non-universal projection

While the universal projection generalization for wh-questions seems consistent with the relevant examples discussed in the literature, we take it to be clear that universal projection is not always attested. Here we provide a first set of illustrations. The unembellished universal projection generalization predicts B's question in (12) below to presuppose that every member is female.

(12) A: Some member nominated herself.
B: Which [$_R$ member] ([$_S$ nominated herself])?

This is so, at least, if the feminine gender marking on the reflexive pronoun *herself* is analyzed as a presupposition trigger (Cooper 1983), so that S carries the presupposition content specified in (13). However, this prediction appears incorrect. The question in (12) may presuppose that some member is female or perhaps, more specifically, that the discourse referent introduced by A's statement is female, but surely not that all members are female.

(13) π(S)(x)(w) $\Leftrightarrow$ x is female in w

Analogous observations hold for the discourses in (14) and (16). In these cases, the wh-phrase's scope carries the presuppositional content specified in (15) and (17), triggered by the definiteness of *their* and the factivity of *know*, respectively. The universal projection generalization accordingly leads one to expect that B's question presupposes that each of the colleagues has Australian relatives and that each of those 50 runners will be disqualified. Once again we take those predictions to be incorrect. In each case, the attested presupposition seems, again, to be existential, or, perhaps, more specifically a presupposition about the discourse referent introduced by A's existential statement.

(14) A: Some of the colleagues brought their Australian relatives to the meeting.
B: Which [$_R$ of the colleagues] ([$_S$ brought their Australian relatives])?

(15) π(S)(x)(w) $\Leftrightarrow$ x has Australian relatives in w

(16) A: Some of those 50 runners know that they will be disqualified.
B: Which [$_R$ of those 50 runners] ([$_S$ know that they will be disqualified])?

(17) π(S)(x)(w) $\Leftrightarrow$ x will be disqualified in w

What are the implications of these observations for the local context account, which is designed to deliver the universal projection generalization? The account can conceivably be reconciled with the data above by appealing either to tacit restriction of the wh-phrase's domain (e.g. George 2011) or to local accommodation in the sense of Heim (1983). Tacit domain restriction could strengthen the restrictor property of the question in (12), so that the universally projected presupposition would merely entail that certain members are female, not that all members are. Likewise for the questions in (14) and (16). Alternatively, local accommodation could be posited to obviate projection, thereby also accounting for the absence of the problematic universal presuppositions in the relevant examples.

We doubt, however, that either tacit domain restriction or local accommodation is part of the correct analysis of the non-projection data presented above. In alignment with experimental findings reported in Chemla (2009) and Geurts and van Tiel (2016), it seems to us that tacit domain restriction is hard or impossible in cases where *which* combines with a partitive of the form *of Def Num NP* (where Def is a definite or demonstrative determiner, Num is a numeral, and NP is a noun phrase). Example (16) illustrates that non-universal projection is found in particular in cases of this form, suggesting that tacit domain restriction is at least insufficient to capture the observed absence of universal projection. With regard to local accommodation, we note that this process, if posited in wh-questions, must be tightly constrained. One reason is that the unavailability of local accommodation is an implicit premise of current analyses of the so-called factive island effect illustrated by (18), from Oshima (2007).

(18) *Who does Max know that Alice got married to on June 1st?

Oshima (2007) and Abrusán (2011) propose two different analyses on which factive island questions suffer from certain pathologies of meaning. We will not review these analyses here, but we note that under both accounts, the intended meaning pathology would be obviated by local accommodation of the factive presupposition. If either Oshima's and Abrusán's account is correct, then, local accommodation can be unavailable in wh-questions even if projection yields a pathological meaning. It would therefore be surprising if local accommodation were available in cases like those above, where there seems to be less pressure for universal projection to apply, given that it would not result in a comparable pathology.

Motivated in part by these doubts about the local context account, we will in the following explore an alternative approach to the presence and absence of universal projection in wh-questions, an approach whose central ingredient is a family of pragmatic question bridge principles.

4. Universal projection from three bridge principles

We propose to revise Guerzoni's (2003) proposal by replacing the question bridge principle in (11) with a family of three pragmatic bridge principles: informally, the *No Accommodation* condition requires that a questioner avoid the need for accommodation of the presupposition of a possible answer, hence that answer presuppositions be either satisfied by common knowledge or else incompatible with it; the *Restrictor Economy* condition obligates the questioner to avoid possible answers whose presuppositions are incompatible with common knowledge; and the *Restrictor Homogeneity* condition demands that the questioner aims for the set of possible answers to be fully determined by common knowledge.

Maintaining the assumptions catalogued in (19a) and (19b), which repeat (10a) and (10b), and still assuming that question meanings map worlds to sets of propositions, these bridge principles can be explicated as the felicity conditions listed in (20). For wh-questions of the form *wh R S*, under the Hamblin-Karttunen semantics in (10c), repeated in (19c), these conditions amount to those listed in (21).

(19) a. **Frege-Strawson view of presupposition**
$\pi(\phi) = \text{dom}([\![\phi]\!])$
b. **Stalnaker's assertion bridge principle**
ϕ is felicitous in c only if $c \subseteq \text{dom}([\![\phi]\!])$
c. **Hamblin-Karttunen semantics**
$[\![\text{wh R S}]\!] = \lambda w.\{[\![S]\!](x) \mid [\![R]\!](x)(w)\}$

(20) Q is felicitous in c only if
i. **No Accommodation**
$\forall p[\ c \subseteq \{w: p \in Q(w)\} \rightarrow c \subseteq \text{dom}(p) \vee c \cap \text{dom}(p) = \emptyset]$
ii. **Restrictor Economy**
$\forall p[\ c \subseteq \{w: p \in Q(w)\} \rightarrow c \cap \text{dom}(p) \neq \emptyset]$
iii. **Restrictor Homogeneity**
$\forall w,w'[w,w' \in c \rightarrow Q(w) = Q(w')]$

(21) $[\![\text{wh R S}]\!]$ is felicitous in c only if
i. **No Accommodation**
$\forall x[\ c \subseteq [\![R]\!](x) \rightarrow c \subseteq \text{dom}([\![S]\!](x)) \vee c \cap \text{dom}(([\![S]\!])(x)) = \emptyset]$
ii. **Restrictor Economy**
$\forall x[\ c \subseteq [\![R]\!](x) \rightarrow c \cap \text{dom}([\![S]\!](x)) \neq \emptyset]$
iii. **Restrictor Homogeneity**
$\forall w,w'[w,w' \in c \rightarrow \{x:[\![R]\!](x)(w)\} = \{x:[\![R]\!](x)(w')\}]$

Our central observation about these felicity conditions, established in detail in the Appendix, is that for wh-questions, under the Hamblin-Karttunen semantics assumed, the three bridge principles taken together have the consequence (22). Those principles, taken together, derive universal projection.

(22) **universal projection derived**
$[\![\text{wh R S}]\!]$ is felicitous in c only if
$c \subseteq \{w: \forall x[[\![R]\!](x)(w) \rightarrow w \in \text{dom}([\![S]\!](x))]\}$

Before building on this result in the remainder of the paper, we note that, while we cannot offer a general theory of felicity conditions in which the particular bridge principles posited here can be embedded, these principles strike us as plausible conditions on prototypical question-answer exchanges. We take it to be natural that a questioner will strive to avoid the need to accommodate the presupposition of a possible answer (No Accommodation) and to restrict the answer space to only those propositions that are still live options in the conversation (Restrictor Economy).

As for Restrictor Homogeneity, we suggest that it provides a possible way of interpreting the familiar notion of D-linking introduced in Pesetsky (1987). Pesetsky notes: "When a speaker asks a question like *which book did you read?*, the range of felicitous answers is limited by a set of books both speaker and hearer have in mind. If the hearer is ignorant of the context assumed by the speaker, a *which*-question is odd". Echoing related remarks in George (2011) in a different context, we propose that Pesetsky's observation can be understood as follows. It is very unlikely for the full extension of the bare noun *book* to be invariable throughout a context set. Hence it may at first seem unlikely for the question *Which book did you read?* to satisfy the Restrictor Homogeneity condition. However, this condition could well be met if the wh-phrase's domain is tacitly understood by the interlocutors as restricted to a particular set of books, say the set of books on this shelf that the interlocutors are attending to. What we propose, then, is that D-linking is tacit restriction of the wh-phrase's domain that is driven by the pressure to meet Restrictor Homogeneity. The question left open under this line of thought, though, is what to make of Pesetsky's proposal that D-linking is restricted to *which*-questions, excluding wh-questions with bare *who* or *what*. We return to this issue in section 5.3 below.

5. A typology of non-universal projection

While universal projection follows from the three proposed bridge principles taken together, it can be shown (as the reader is invited to confirm) that no two of these principles are sufficient to derive universal projection. We now note that while felicity conditions provide listeners with a guide to the speaker's assumptions, the listener might under certain conditions take the speaker to act in violation of one of the felicity conditions. The assumption that one of the three felicity conditions in (20) is violated would result in the obviation of the inference of a universally projected presupposition. Below, we present data that we interpret as showing that, indeed, each of the three conditions in (20) is suspendable and that the suspension of any one of the three principles results in the expected absence of universal projection.

5.1. The No Accommodation condition suspended

We begin by revisiting the examples presented in section 3 above. We submit that the attested absence of universal projection in all of those cases has the same source, viz. a violation of the No Accommodation condition stated in (20)i. For illustration, we focus here on the question in (14)B, repeated below as (23). The restrictor property and the presupposition are as shown in (24) (where (b) repeats (15)).

(23) Which [$_R$ of the colleagues] [$_S$ brought their Australian relatives]?

(24) a. $[\![R]\!](x)(w) \Leftrightarrow$ x is one of the colleagues in w
b. $\pi(S)(x)(w) \Leftrightarrow$ x has Australian relatives in w

Consider now the type of scenario described in (25). Relative to this scenario, the question (23) would satisfy Restrictor Homogeneity (20)iii and Restrictor Economy (20)ii, but not No Accommodation (20)i.

(25) **Type 1 scenario**
it is common knowledge that the colleagues are $r_1, \ldots, r_n$; for each of $r_1, \ldots, r_n$, the questioner lacks an opinion about whether they have Australian relatives

It would satisfy Restrictor Homogeneity because common knowledge fully determines the set of colleagues. It would satisfy Restrictor Economy because for each member x of that set, the speaker's belief's, and hence common knowledge, is compatible with x having Australian relatives. But it would violate No Accommodation because for some (in fact, every) member x of that set, the speaker's beliefs, and hence common knowledge, fails to entail that x has Australian relatives.

We believe that the question (23) indeed has acceptable uses in such a scenario. In fact, we take the discourse in (14) above, repeated here as (26), to make that point, since it is easy to imagine B's question in (26) as occurring in a type 1 scenario (where common knowledge is now the common knowledge of A and B).

(26) A: Some of the colleagues brought their Australian relatives to the meeting.
B: Which [$_R$ of the colleagues] [$_S$ brought their Australian relatives]?

On our analysis, this demonstrates that suspension of the No Accommodation condition is a possible source of the absence of universal presupposition projection in wh-questions.

5.2. Restrictor Economy suspended

We will present an observation suggesting that Restrictor Economy, too, can be suspended. We will make this case with respect to the question in (27), where the restrictor property is as in (28a), and the presupposition property, due to the factivity of *know*, is as shown in (28b).

(27) Which [$_R$ of our players] [$_S$ does Fred know _ scored in the last game]?

(28) a. $[\![R]\!](x)(w) \Leftrightarrow$ x is one of our players in w
b. $\pi(S)(x)(w) \Leftrightarrow$ x scored in the last game in w

Consider now the type of scenario described in (29). Relative to this scenario, the question (27) would satisfy Restrictor Homogeneity (20)iii and No Accommodation (20)i, but not Restrictor Economy (20)ii.

(29) **Type 2 scenario**
it is common knowledge that our players are $r_1, \ldots, r_n$ (n>3); for r_1, r_2, r_3, it is common knowledge that they scored; for $r_4, \ldots, r_n$, it is common knowledge that they did not score

The question would satisfy Restrictor Homogeneity because common knowledge fully determines the set of players. It would satisfy No Accommodation because for each member x of that set, either common knowledge entails that they scored in the last game, or it entails that they did not. But it would violate Restrictor Economy precisely because for some members x of the set, common knowledge entails that they did not score.

We suggest that the question in (27) is indeed usable in this type of scenario. To illustrate, it seems clear that (30) below can be a successful exchange embedded in type 2 scenario.

(30) A: Crazy Fred is turning into a real problem. Whenever he finds out that one of our players scored a goal in a league game, within a week or two he sends that player a threatening text message.

B: We need to protect our players! Which [$_R$ of them] [$_S$ does Fred know __ scored in the last game]?

Since common knowledge in the type 2 scenario is inconsistent with the potential universal presupposition, the mere acceptability of (30) is indicative of the absence of universal projection. We conclude that the suspension of Restrictor Economy is a second possible source of the absence of universal projection.[3]

5.3. Restrictor Homogeneity suspended

Finally, we submit that Restrictor Homogeneity, too, is subject to acceptable suspension, and that such suspension goes along with the expected absence of universal projection. We propose that "quiz show questions" routinely violate the Restrictor Economy condition. For eample, we take it to be obvious that (31) could be appropriately posed by a TV show host to a candidate even when common knowledge fails to determine the set of Japanese nobel prize winners. In particular, it seems clear that (31) would be usable in a quiz show setting that instantiates the type 3 scenario in (32).

(31) Which [$_R$ Japanese Nobel Prize winner] [$_S$ died last month]?

(32) **Type 3 scenario**
it is common knowledge that there are some Japanese Nobel Prize winners, but there is no x such that it is common knowledge that x is a Japanese Nobel Prize winner

In this scenario, not only does common knowledge fail to determine the set of Japanese Nobel Prize winners, in violation of Restrictor Homogeneity (20)iii, but common knowledge even fails to determine this set partially, as it fails to identify any individual as a Japanese Nobel Prize winner. It is because of that property of the scenario that No Accommodation (20)i and Restrictor Economy (20)ii are satisfied vacuously, as the universal quantification (20)i and (20)ii ranges over the empty set of propositions.

[3] It seems plausible to us that acceptable violations of Restrictor Economy can arise when speakers aim to satisfy a competing constraint that is incompatible with Restrictor Economy. In the analysis of (30) the competing constraint that comes to mind is Gricean brevity. The speaker could have avoided the violation of Restrictor Economy by using a restrictor like *of the players who scored a goal in the last game* instead of *of them*, but refrained from doing so in order to reduce utterance length or syntactic complexity. Cummins et al. (2013: 204) make a related observation that a speaker may choose to use a presupposition trigger and later explicitly deny the presupposition if the alternative to the trigger involves a circumlocution.

Consider now the variant of (31) shown in (33). Given the restrictor and the presupposition properties shown in (34), universal projection would yield the presupposition that every Japanese Nobel Prize winner has Australian collaborators.

(33) Which [$_R$ Japanese Nobel Prize winner] [$_S$ accused one of his Australian collaborators of plagiarism last month]?

(34) a. $[\![R]\!](x)(w) \Leftrightarrow$ x is a Japanese Nobel prize winner in w
b. $\pi(S)(x)(w) \Leftrightarrow$ x has Australian collaborators in w

It seems obvious that (33) in fact need not carry such a universal presupposition. As announced above, we propose attributing the absence of universal projection in this case to the suspension of Restrictor Economy.

Recall also our proposal from above that Pesetsky's (1987) notion of D-linking can be understood as tacit restriction of a wh-phrase's domain driven by the pressure to meet the homogeneity requirement. The question we left open is why obligatory D-linking would be restricted to *which*-questions, as Pesetsky proposed. The question is, in particular, why questions with bare wh-phrases *who* and *what* need not be D-linked. We cannot offer an explanatory answer to this question, but we note that under our interpretation, this restriction might indicate that Restrictor Homogeneity is not in fact a general condition on question use, but merely, for reasons that remain to be elucidated, a condition on the use of *which*-questions.[4]

If so, it is predicted that universal projection is systematically absent in wh-questions with bare *who* or *what*. It turns out that this prediction is compatible with judgments reported in the literature – simply because the cases used to illustrate universal projection in wh-questions happen to not include any questions with bare *who* or *what* (Schlenker 2008, 2009, Abrusán 2011, 2014, Nicolae 2015) . Consider, then, the question in (36), a variant of (2) above, which is repeated here as (35).

(35) Who [$_R$ among those ten boys] [$_S$ does Mary regret that Bill invited __]?

(36) Who does Mary regret that Bill invited __?

We take it that judgments regarding universal projection are less clear for (36) than they are for (35). Under analyses that derive, or presuppose, the unqualified universal projection generalization (Schlenker 2008, 2009, Abrusán 2011, 2014), a natural interpretation of this finding is that,

[4] Typologically, the English contrast between D-linked *which* and non-D-linked *what/who* seems to be replicated in several different ways. For instance, French has been reported by Baunaz (2011: 203) to employ a special prosodic contour (slight fall rise accent) on wh-words to signal specificity, that is, that "the speaker has a very good idea that the interlocutor has a specific referent in mind". Languages which have morphological markers triggering D-linking, such as Turkish on the account of Enç (1991), may use or not use those on wh-words depending on contextual factors (e.g. Kornfilt 2013). It remains to be seen if these contrasts translate into different behaviours with respect to presupposition projection.

while universal projection is actually present in (36), uncertainty about the wh-phrase's domain renders the universal presupposition hard to detect. That is, proponents of these accounts could point out that it is expectedly hard to confirm whether (36) presupposes that Bill invited everyone, simply because it is unclear what individuals the universal quantification ranges over. In contrast, our own analysis leads us to propose that the uncertainty about the wh-phrase's domain, via suspension of Restrictor Homogeneity, does not merely render universal projection hard to detect, but in fact preempts universal projection from taking place in the first place, in virtue of removing one of the premises that we consider necessary to derive it.

6. Conclusions

Building on Guerzoni (2003), we have attributed the universal projection of presuppositions in wh-questions, where observed, to the conspiracy of three question bridge principles. If, like other felicity conditions, these principles are violable under certain conditions, they predict a typology of possible instances of non-universal projection. For each principle, we have presented instances of non-universal projection that we attribute to the principle's suspension.

This proposal leaves many questions unanswered. First, while we have offered instances of violations of each of the three felicity conditions, we have said little about what it is about the examples presented that allows for those violations, hence we have not pinpointed the ultimate source of the absence of universal projection in the relevant cases.

Second, the analysis is subject to an important limitation. Since it is based on felicity conditions on asking questions, in its present form it is not applicable to embedded questions. But presupposition projections can of course be observed to project from embedded questions as well. To illustrate, (38) embeds (2), repeated again as (37), under *know*.

(37) Who [$_R$ among those ten boys] [$_S$ does Mary regret that Bill invited __]?

(38) Ann knows [who [$_R$ among those ten boys] [$_S$ Mary regrets that Bill invited __]].

It seems clear that, to the extent that (37) is intuited to presuppose that Bill invited each of those ten boys, so is (38). For the pragmatic bridge account to capture this parallel, or any projection of presuppositions from embedded questions, it would need to be suitably generalized. The prospects for that project remain to be assessed.[5]

Finally, we can pose an updated version of a question formulated at the end of section 3. There we asked how Schlenker's (2008; 2009) local context account, which is designed to derive the universal projection generalization, could be rendered compatible with cases of non-universal projection. We noted that the effects of this theory could conceivably be weakened by appealing to tacit restriction of the wh-phrase's domain (George 2011) or local accommodation (Heim 1983). In section 3, we already voiced doubts about the prospects of this approach. In addition,

[5] We thank Philippe Schlenker (personal communication) for pressing us on this point.

we now note that tacit domain restriction or local accommodation would need to selectively apply in the three type of scenarios that we have identified as supporting the suspension of one of the three question bridge principles. Under the local context account, the question that arises is why domain restriction or local accommodation would apply under just those circumstances.

Appendix

In this appendix, we wish to confirm that the three bridge principles posited in section 4 derive universal projection. Assuming a non-empty context set c, we first show that the conditions in (20), repeated in (39), jointly entail (40).

(39) Q is felicitous in c only if

i. **No Accommodation**
$\forall p[\, c\subseteq\{w: p\in Q(w)\} \rightarrow c\subseteq dom(p) \vee c\cap dom(p)=\emptyset]$

ii. **Restrictor Economy**
$\forall p[\, c\subseteq\{w: p\in Q(w)\} \rightarrow c\cap dom(p)\neq\emptyset]$

iii. **Restrictor Homogeneity**
$\forall w,w'[w,w'\in c \rightarrow Q(w)=Q(w')]$

(40) Q is felicitous in c only if
$c \subseteq \{w: \forall p[p\in Q(w) \rightarrow w\in dom(p)]\}$

Proof: The statements in (i) and (ii) entail (A). Given (iii), and given that c is non-empty, $\forall w[w\in c \rightarrow p\in Q(w)]$ and $\exists w[w\in c\ \&\ p\in Q(w)]$ are equivalent for any p, so (A) and (B) are equivalent. Since w does not occur on the right-hand side of the material implication in (B), (B) is equivalent to (C), which in turn is equivalent to (D). Since for any $w\in c$, $c\subseteq dom(p)$ entails $w\in dom(p)$, (D) entails (E), and hence (F). QED

(A) $\forall p[\, c\subseteq\{w: p\in Q(w)\} \rightarrow c\subseteq dom(p)]$
(B) $\forall p[\, \exists w[w\in c\ \&\ p\in Q(w)] \rightarrow c\subseteq dom(p)]$
(C) $\forall p,w[w\in c\ \&\ p\in Q(w) \rightarrow c\subseteq dom(p)]$
(D) $\forall w[w\in c \rightarrow \forall p[p\in Q(w) \rightarrow c\subseteq dom(p)]\,]$
(E) $\forall w[w\in c \rightarrow \forall p[p\in Q(w) \rightarrow w\in dom(p)]\,]$
(F) $c \subseteq \{w: \forall p[p\in Q(w) \rightarrow w\in dom(p)]\}$

For wh-questions, under the Hamblin-Karttunen semantics, (40) amounts to (41) as intended, deriving universal projection.

(41) $[\![\text{wh R S}]\!]$ is felicitous in c only if
$c \subseteq \{w: \forall x[[\![R]\!](x)(w) \rightarrow w\in dom([\![S]\!](x))]\}$

References

Abrusán, M. (2011). Presuppositional and negative islands: a semantic account. *Natural Language Semantics 19*(3), 257–321.

Abrusán, M. (2014). *Weak Island Semantics*. Oxford University Press.

Barwise, J. and R. Cooper (1981). Generalized quantifiers and natural language. *Linguistics and Philosophy 4*(2), 159–219.

Baunaz, L. (2011). *The grammar of French quantification*, Volume 83. Springer Science & Business Media.

Chemla, E. (2009). Presuppositions of quantified sentences: experimental data. *Natural Language Semantics 17*(4), 299–340.

Cooper, R. (1983). *Quantification and Semantic Theory*. Dordrecht: Reidel.

Cummins, C., P. Amaral, and N. Katsos (2013). Backgrounding and accommodation of presuppositions: an experimental approach. In *Proceedings of Sinn und Bedeutung*, Volume 17, pp. 201–218.

Enç, M. (1991). The semantics of specificity. *Linguistic Inquiry 22*, 1–25.

George, B. R. (2011). *Question embedding and the semantics of answers*. Ph. D. thesis, University of California, Los Angeles.

Geurts, B. and B. van Tiel (2016). When "all the five circles are four": New exercises in domain restriction. *Topoi 35*(1), 109–122.

Guerzoni, E. (2003). *Why even ask?: on the pragmatics of questions and the semantics of answers*. Ph. D. thesis, Massachusetts Institute of Technology.

Hamblin, C. L. (1973). Questions in Montague English. *Foundations of Language 10*, 41–53.

Heim, I. (1983). On the projection problem for presuppositions. In D. F. M. Barlow and M. Wescoat (Eds.), *Proceedings of the Second West Coast Conference in Linguistics*, pp. 249–260.

Karttunen, L. (1977). Syntax and semantics of questions. *Linguistics and Philosophy 1*, 3–44.

Keenan, E. L. and J. Stavi (1986). A semantic characterization of natural language determiners. *Linguistics and Philosophy 9*(3), 253–326.

Kornfilt, J. (2013). *Turkish*. Routledge.

Nicolae, A. C. (2015). Questions with NPIs. *Natural Language Semantics 23*(1), 21–76.

Oshima, D. Y. (2007). On Factive Islands: pragmatic anomaly vs. pragmatic infelicity. In *New Frontiers in Artificial Intelligence*, pp. 147–161. Springer.

Pesetsky, D. (1987). Wh-in-situ: Movement and unselective binding. In E. J. Reuland and A. G. B. ter Meulen (Eds.), *The Representation of (In)definiteness*, Volume 98 of *Current Studies in Linguistics*, pp. 98–129. Cambridge, MA: MIT Press.

Schlenker, P. (2008). Presupposition projection: Explanatory strategies. *Theoretical Linguistics 34*(3), 287–316.

Schlenker, P. (2009). Local contexts. *Semantics and Pragmatics 2*, 1–78.

Schwarz, B. and A. Simonenko (2016). Two pragmatic accounts of factive islands. In B. Prickett and C. Hammerly (Eds.), *Proceedings of 46th annual meeting of the North East Linguistic Society (NELS 46)*. GLSA (Graduate Linguistics Student Association), Department of Linguistics, University of Massachusetts.

Simonenko, A. (2016). Semantics of DP islands: the case of questions. *Journal of Semantics 33*(4), 661–702.

Stalnaker, R. (1973). Presuppositions. *Journal of Philosophical Logic 2*(4), 447–457.

Stalnaker, R. (1978). Assertion. In P. Cole (Ed.), *Syntax and Semantics*, Volume 9, pp. 78–95. Academic Press, New York.