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Factive islands from necessary blocking*

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Abstract Oshima (2007) and Schwarz & Simonenko (2018a) credit the unacceptability of so-called factive islands to necessary infelicity – the violation of some or other felicity condition on (wh-)questions in all accessible contexts. We apply this analysis to new types of factive islands – in wh-questions with *if any* and in multiple wh-questions – and argue that they pose challenges for an analysis in terms of necessary infelicity. We propose that factive islandhood can be understood as due to necessary blocking: in all accessible contexts where such a question would otherwise be felicitous, the speaker would have had to use a different, more suitable, question instead. We show that the necessary blocking analysis applies correctly to both classic factive islands and to the new types that we have identified.

Keywords: factive islands, unacceptability, wh-questions, felicity conditions, existence presupposition, uniqueness, blocking

1 Introduction

Szabolcsi & Zwarts (1993) discovered a *factive island* effect in wh-questions like those in (1), cases where wh-movement from an embedded clause results in unacceptability. ((1a) is from Szabolcsi & Zwarts 1993; (1b) is from Oshima 2007.)

(1) a. *From whom do you regret [having gotten this letter __]?
b. *Who does Max know [that Alice got married to __ on June 1st]?
c. *Where did they know [that Caesar was murdered __]?

The effect is associated with two characteristic properties. First, the embedding

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predicate is factive: *know* and *regret* introduce the presupposition that their complement is true. Second, the set determined by the clausal complement (which contains the wh-trace) has no more than one element. More precisely that set has no more than one element in normal, or, as we will say, *accessible*, contexts. In accessible contexts, there is no more than one person that you got the letter from or got married to on June 1st, and there is no more than one place where Caesar was murdered. Confirming the role of these two characteristics in factive islands, the examples in (2) and (3) (where (a) is from Szabolcsi & Zwarts 1993) show that removing either factivity or uniqueness restores acceptability.

(2) a. From whom do you believe [having gotten this letter __]?
b. Who does Max think [that Alice got married to __ on June 1st]?
c. Where did they suspect [that Caesar was murdered __] ?

(3) a. To whom do you regret [having shown this letter __]?
b. Who does Max know [that Alice talked to __ on June 1st]?
c. Where did they know [that Caesar had sent troops __] ?

Questions like those in (4) below, with *why* and *how* extracted from the complement of a factive predicate, were of central interest in earlier studies on the factive island effect (e.g., Cinque 1990, Rooryck 1992). In fact, it is this type of question that the term *factive island* was initially applied to.

(4) a. *Why does Max know [that Alice insulated Pat __]?
b. ?*How does Max know [that Alice went to San Francisco__]?

Oshima (2007) suggested that such adjunct questions too instantiate the feature of uniqueness, though less obviously so. If this is correct, their unacceptability can be taken to have the very same source as the unacceptability of factive islands of the sort exemplified in (1). In this paper, however, we will focus on the latter type of factive island, and we will remain agnostic as to whether a uniform account is possible that also captures cases with *why* and *how* (see Abrusán 2011; Schwarz & Simonenko 2018a,b for relevant discussion).

Szabolcsi & Zwarts proposed that factive island questions are unacceptable in virtue of lacking a proper meaning. How do factive island questions come to lack a proper meaning? Szabolcsi & Zwarts' answer is that such questions are semantically uninterpretable. Arguing against this answer, Oshima (2007) and Abrusán (2011) were the first to propose that factive islands are semantically interpretable but that their meaning is pathological. For Abrusán, the pathology is *propositional*, in the sense that the relevant questions, in virtue of presuppaltosing a contradiction, carry pathological propositional content. Schwarz & Simonenko (2018a) argue against this account, and instead make a case for the proposal in Oshima 2007, which credits

factive islands to a pathology that is not propositional in the relevant sense. On Oshima's analysis, and more explicitly so in Schwarz & Simonenko's rendition of it, factive islands instead suffer from a necessary conflict between conditions on the felicitous use of (wh-)questions, a pathology that we will here refer to as *intrinsic triviality*.

In this paper, we make a case that not all instances of factive islandhood can be attributed to intrinsic triviality. We in particular draw attention to factive island effects in wh-questions with *if any*-modifiers and in multiple wh-questions, where factive islands have not previously been identified. We observe that, under assumptions that may well be correct, those questions are not intrinsically trivial. We propose that their pathology can instead be understood as a blocking effect, viz. blocking by different questions, questions that have no less potential for information gain and that are preferable in virtue of being syntactically less marked or complex, or in virtue of being presuppositionally stronger.

Section 2 reviews the intrinsic triviality analysis; Section 3 introduces the new data that we argue this proposal fails to capture; and Section 4 articulates our new analysis of factive islands in terms of necessary blocking.

2 Factive islands from intrinsic triviality

The intrinsic triviality analysis assumes that question extensions are sets of propositions, the so-called Hamblin answers (Hamblin 1973, Karttunen 1977), which we can model as functions from possible worlds to truth values. Presuppositions carried by Hamblin answers can be encoded as conditions on the domains of those functions. To illustrate, in a given world w, the question in (5) is assigned the extension in (6). The condition between the colon and the period encodes the factive presupposition due to *regret*. In a world where Ian (I) and Jan (J) are the only people, the extension is the doubleton set in (7).

(5) Who regretted nominating themselves?

(6) $\{\lambda w\text{: } \textsc{nominate}_w(x,x).\ \textsc{regret}_w(x, \textsc{nominate}(x,x)) \mid \textsc{person}_w(x)\}$

(7) $\left\{ \begin{array}{l} \lambda w\text{: } \textsc{nominate}_w(I,I).\ \textsc{regret}_w(I, \textsc{nominate}(I,I)) \\ \lambda w\text{: } \textsc{nominate}_w(J,J).\ \textsc{regret}_w(J, \textsc{nominate}(J,J)) \end{array} \right\}$

Turning to factive islands, we will illustrate with example (8), which repeats (1c). Its extension in a given world w is shown in (9), which will amount to (10) if Rome (R) and Alexandria (A) are the only places in w.

(8) *Where did they know [that Caesar was murdered __] ?

(9) $\{\lambda w\text{: } \textsc{murder}_w(x).\ \textsc{know}_w(\text{they}, \textsc{murder}(x)) \mid \textsc{place}_w(x)\}$

(10) $\left\{ \begin{array}{l} \lambda w\text{: } \textsc{murder}_w(R).\ \textsc{know}_w(\text{they}, \textsc{murder}(R)) \\ \lambda w\text{: } \textsc{murder}_w(A).\ \textsc{know}_w(\text{they}, \textsc{murder}(A)) \end{array} \right\}$

There is no accessible context where Caesar was murdered in both Rome and Alexandria. Therefore, in any accessible context, the presuppositions carried by the two Hamblin answers in (10) are mutually incompatible. More generally, due to the factivity and uniqueness features identified in Section 1, there is no accessible context where more than one of the Hamblin answers in (9) has a true presupposition. We will now refer to this property of factive island questions like (8) as *Uniqueness*. Identifying contexts with context sets in the sense of Stalnaker 1978, a question extension Q meets Uniqueness just in case (11) holds for any accessible context c, that is, if there is no world in c where the presuppositions of two different Hamblin answers are true.

(11) *Uniqueness*
$\forall p,q[[p,q \in Q \wedge p \neq q] \rightarrow dom(p) \cap c \cap dom(q) = \emptyset]$

On the intrinsic triviality analysis, the unacceptability of factive island questions stems from the fact that, given Uniqueness, they violate some or other felicity condition in all accessible contexts. Here we sketch a rendition of the analysis that posits three felicity conditions on (wh-)questions, expressed in (12) as conditions on a question extension Q in a context c.

(12) a. *Answerability*
$\exists p[p \in Q \wedge c \subseteq dom(p)]$

b. *Existence*
$c \subseteq \bigcup Q$

c. *Informativity*
$\exists p[p \in Q \wedge c \cap p \neq \emptyset \wedge c \not\subseteq p]$

Answerabilty demands that there be a Hamblin answer whose presupposition the context entails; *Existence* requires the context to entail that at least one of the Hamblin answers in Q is true; and *Informativity* calls for the existence of a Hamblin answer whose truth the context neither entails nor excludes. These conditions are assumed to govern idealized question use, even though, given repair mechanisms like presupposition accommodation, they are not expected to always be respected in actual conversation. Answerability was posited for independent reasons in Guerzoni (2003), there dubbed the *question bridge principle*. Existence is a way of encoding the existence presupposition of wh-questions often assumed in the literature (e.g., Horn 1972, Dayal 1996, Fox & Hackl 2006), motivated by the intuition that, for example, *Who left?* presupposes that someone left.

The claim now is that in any accessible (hence, non-empty) context set, a question that instantiates Uniqueness violates at least one of the three felicity condition. To prepare our proof of this claim, we introduce an auxiliary notion. As defined in (13), the *active core* of a question extension Q in a context c, Q/c, is the set of those members of Q whose presupposition is compatible with c.

(13) *Active core*
$Q/c := \{p \mid p \in Q \wedge c \cap dom(p) \neq \emptyset\}$

Now we observe that, if c is non-empty, and Q and c instantiate Uniqueness and meet Answerability, then Q/c is a singleton. Assuming that Q/c is a singleton, we can now distinguish two cases. Case 1 is that c entails the unique Hamblin answer in Q/c; it is apparent that in that case, Q and c violate Informativity. Case 2 is that c does not entail the unique Hamblin answer in Q/c; in that case, Q and c violate Existence.

Hence the question extension (9), in virtue of instantiating (11) in all accessible contexts, violates at least one of the felicity condition in (12) in all accessible contexts. On the intrinsic triviality analysis, it is this necessary infelicity that is responsible for the factive island effect in questions like (8).

3 Factive islands without intrinsic triviality

We now present novel observations which suggest that in certain cases factive islandhood is attested despite intrinsic triviality being averted, due to the absence of Existence or of Uniqueness. If this is the correct interpretation of our new data, then the intrinsic triviality analysis undergenerates factive islands.

3.1 Factive islands without Existence?

The Existence condition that the intrinsic triviality analysis appeals to is indeed a critical ingredient of the analysis. The necessary infelicity credited for factive islandhood does not arise without Existence. We confirm this claim with an example showing that Uniqueness does not prevent Answerability and Informativity from both being met. Consider again (8), repeated in (14), and its extension (15) in a world where Rome (R) and Alexandria (A) are the only places.

(14) *Where did they know [that Caesar was murdered __] ?

(15) $\left\{ \begin{array}{l} \lambda w\text{: } \textsc{murder}_w(R).\ \textsc{know}_w(\text{they}, \textsc{murder}(R)) \\ \lambda w\text{: } \textsc{murder}_w(A).\ \textsc{know}_w(\text{they}, \textsc{murder}(A)) \end{array} \right\} = \left\{ \begin{array}{l} r \\ a \end{array} \right\}$

Now consider the context $c_0 := dom(r) - dom(a)$, the set of all worlds where Caesar

was murdered in Rome, and not in Alexandria. (Note that dom(r), being the set of all *logically* possible worlds where Caesar was murdered in Rome, includes worlds where Caesar was also murdered in Alexandria; subtraction of dom(a) excludes those unlikely worlds from c_0.) We observe that c_0 entails that Caesar was not murdered in Alexandria, that is, $c_0 \cap \text{dom(a)} = \emptyset$, so (15) and c_0 instantiate Uniqueness; c_0 also entails that Caesar was murdered in Rome, that is, $c_0 \subseteq \text{dom(r)}$, so (15) and c_0 meet Answerability; and c_0 does not settle whether they know that Caesar was murdered in Rome, that is, $c_0 \cap \text{r} \neq \emptyset$ and $c_0 \not\subseteq \text{r}$, so (15) and c_0 meet Informativity. With Existence removed, then, inconsistency is averted and no unacceptability is derived.

The intrinsic triviality analysis' reliance on Existence, however, can be considered a weakness. As often observed (e.g., Horn 1972), and illustrated by (16), the purported existence presupposition that motivates Existence (here, the intuited inference that someone left) can very naturally be contradicted in response to a question.

(16) A: Who left?
B: No one.

Such responses do not seem to carry a detectable signature of presupposition denial (e.g., von Fintel 2004), and in particular do not seem to require a marked prosody. This suggests that the existence implication that a question like *Who left?* has been reported to give rise to can be absent or can easily be cancelled.

This observation could be interpreted as showing that, at least sometimes, the Existence condition is not operative in actual conversation. Being dependent on Existence, the intrinsic triviality analysis would then require the assumption that Existence is nevertheless invariably operative in the interpretation of factive island questions. However, not only is it unclear how this assumption could be motivated on independent grounds, it is also challenged by additional data. Horn (1972) observed that a wh-question can lack the expected existence implication in virtue of the wh-phrase being followed by *if any*. The felicitous use of Horn's example (17), for example, surely does not require common belief, or convey in any way, that someone left. In fact, the use of *if any* conveys that the speaker is not certain that someone left.

(17) Who, if anyone, left?

Extending the interpretation of (16) that we have just entertained, this suggests that *if any* is a conventional means for the questioner to signal that Existence is not operative. Necessary infelicity would then be averted, and so the intrinsic triviality analysis predicts that modification with *if any* obviates the factive island effect.

However, this prediction is clearly incorrect. The examples in (18), where *if any* is added to the factive island questions in (1), are just as unacceptable as those in (1) themselves are.

(18) a. *From whom, if anyone, do you regret [having gotten this letter __]?
b. *Who, if anyone, does Max know [that Alice got married to __ on June 1st]?
c. *Where, if anywhere, did they know [that Caesar was murdered __] ?

However, data like (16) and (17) do not actually necessitate the conclusion that Existence sometimes fails to apply. Another possibility is that wh-questions, or at least wh-questions with an *if any*-phrase, do not denote a classical Hamblin answer set like (6) or (11) but a larger set augmented with a *negative answer*, a proposition that constitutes the conjunction of the negations of all the classic Hamblin answers. *Who left?*, or at least of *Who, if anyone, left?*, for example, then has an extension augmented with the negative answer that nobody left. By way of further illustration, suppose again that Rome (R) and Alexandria (A) are the only places. The classic and augmented answer set for (19) is then as shown in (20) and (21), respectively.

(19) Where was Caesar murdered?

(20) $\left\{ \begin{array}{l} \lambda w.\ \text{MURDER}_w(R) \\ \lambda w.\ \text{MURDER}_w(A) \end{array} \right\}$

(21) $\left\{ \begin{array}{l} \lambda w.\ \text{MURDER}_w(R) \\ \lambda w.\ \text{MURDER}_w(A) \\ \lambda w.\ \neg\text{MURDER}_w(R) \wedge \neg\text{MURDER}_w(A) \end{array} \right\}$

Note that, under the assumption that Rome and Alexandria are the only places, the disjunction of all the propositions in the augmented answer set (21), the proposition that Existence requires the context to entail, carries no information, merely conveying that Caesar was murdered somewhere or nowhere. Hence the effect of Existence is trivialized. This observation invites the hypothesis that Existence is always in force, and that the absence of a detectable existence implication is due to Existence being trivialized by the inclusion of the negative answer in the question extension.

Under this analysis of missing existence implications, do factive islands like those in (18) still pose a problem for the intrinsic triviality analysis? It depends on what the negative answer to a question like those in (18) is taken to presuppose, or in other words, what the domain of the negative answer is taken to be. To illustrate, the negative answer in the extension of (18c) will for any place deny that they knew that Caesar was murdered there. But what will it presuppose? How does the negative answer's presupposition relate to the presuppositions of the classic Hamblin answers? Or, as we will say, how do the presuppositions of the classic Hamblin

answers *map onto* the negative answer's presupposition? One possibility is that the mapping is *universal*: the negative answer presupposes that Caesar was murdered in *all* places, hence will be incompatible with any accessible context. A second possibility is that the mapping is merely *existential*: the negative answer merely presuppose that there *some* place where Caesar was murdered, a presupposition that is compatible with accessible contexts. A third possibility is that the classic Hamblin answers' presuppositions do not map onto the negative answer at all, in the sense that the negative answer carries none of those presuppositions.

We now note that the intended effects of the intrinsic triviality analysis would be preserved if the mapping onto the negative answer were universal. In that case, the negative answer would effectively be inert for the purposes of the intrinsic triviality analysis. Its presupposition being incompatible with any accessible context, the augmented question extension would continue to instantiate Uniqueness, and it would meet any of the conditions in (12) if and only if the classic, non-augmented, question extension meets this condition. However, if the mapping of the classic Hamblin answers' presupposition were merely existential, or if there was no mapping at all, the intrinsic triviality analysis would not apply as intended. In that case, a factive island question's augmented extension would not instantiate Uniqueness, as the negative answer's presupposition could be met in an accessible context in addition to the presupposition of one of the classic Hamblin answers. As we invite the reader to confirm, the three conditions in (12) could then be met simultaneously in accessible contexts; and so the account of factive islandhood in terms of intrinsic triviality would not be viable.

For a comprehensive evaluation of the intrinsic triviality analysis, then, one would want to decide on independent grounds how the presuppositions of classic Hamblin answers map onto the negative answer. Given that negative answers permit meta-language renditions as negative universal statements with *no*, like *No one left*, we hypothesize that the mapping of presuppositions onto a negative answer parallels presupposition projection from under a negative universal quantifier with *no*. Reporting on findings based on controlled experimentation, Chemla (2009) concludes that projection from under negative universals in the cases he investigates is universal. For example, Chemla takes (22) to presuppose that each of the 10 students has a father who will receive a congratulation letter.

(22) None of these 10 students knows that his father is going to receive a congratulation letter.

However, while granting Chemla's findings about cases like (22), it does not seem to us that presuppositions *always* project universally from under negative universal quantifiers. In particular, and most relevantly, we fail to detect universal

projection in (23), which we would expect to express the negative answer to the question in (18c). That is, it seems clear that (23) need not be read as presupposing the contextual contradiction that Caesar was murdered in all places.

(23) There is no place such that they know that Caesar was murdered there.

So, assuming that presupposition projection from under negative universal quantifiers parallels the mapping of presuppositions onto negative answers, examples like (23) shed doubt on the assumption that in factive island cases like those in (18), the mapping is universal. By the same token, they shed doubt on the viability of the intrinsic triviality analysis of factive islandhood in such cases.[1]

We now turn to another type of data that we argue shed doubt on the intrinsic triviality analysis as a general account of factive islands, in fact more clearly so than the cases discussed in this section.

3.2 Factive islands without Uniqueness

While the study of factive islands has so far been confined to questions with a single wh-phrase, we observe that the effect extends to multiple wh-questions. In (24), the referential subject *they* in the matrix of (14) is replaced with the wh-phrase *who*.

(24) *Who knew [that Caesar was murdered where]?

In compliance with the superiority condition (Chomsky 1973), it is this phrase that we have placed in initial position, while the wh-phrase *where* that is fronted in (14) remains in situ in the embedded clause. Still, example (24) is no more acceptable than (14) is. This effect moreover carries the signature of factive islandhood. It is dependent on factivity and the uniqueness of the referent that can truthfully resolve the embedded wh-clause, here uniqueness of the place of Caesar's murder. Example (25a) shows that substituting non-factive *think* for factive *know* restores acceptability. Since Caesar may well have moved troops to more than one place, example (25b) changes the embedded clause's content to eliminate uniqueness; this change, too, is judged to remove the factive island effect.

(25) a. Who thought [that Caesar was murdered where]?

1 There is, however, another avenue one might pursue in an attempt to accommodate factive islands with *if any* under (a version of) the intrinsic triviality analysis. As suggested by the morphology, cases like (17) could be analyzed as conditional questions (e.g., Isaacs & Rawlins 2008). On this view, suspension is credited to the assumption that the question is the main clause of a conditional, whose antecedent is given by *if any*. Necessary infelicity might then be calculated within the scope of *if any*, causing unacceptability of the conditional question as a whole. We leave the exploration of this possible analysis to future research.

b. ?Who knew [that Caesar sent troops where]?

In a classic treatment, due to Hamblin (1973) and Karttunen (1977), a multiple wh-question's extension is a Hamblin set containing one proposition per tuple of entities in the cross-product of the wh-restrictors' extensions. In a given world w, the extension of (26), for example, is as shown in (27). If Rome and Alexandria are the only places in w, and Ian and Jan are the only people, then this extension is the four-membered Hamblin set in (28).

(26) Who lives where?

(27) $\{\lambda w.\ \text{LIVE}_w(y,x) \mid \text{PLACE}_w(x) \wedge \text{PERSON}_w(y)\}$

(28) $\left\{ \begin{array}{l} \lambda w.\ \text{LIVE}_w(I,R) \\ \lambda w.\ \text{LIVE}_w(J,R) \\ \lambda w.\ \text{LIVE}_w(I,A) \\ \lambda w.\ \text{LIVE}_w(J,A) \end{array} \right\}$

The classic semantics for multiple wh-questions proposed in Hamblin 1973 and Karttunen 1977 has in more recent literature been identified as the semantics that accounts for so-called single-pair answers (Dayal 1996, 2016). To also account for the possibility of so-called pair-list answers, multiple wh-questions have been proposed to allow for an additional type of interpretation (Dayal 1996, 2016; Fox 2013; Kotek 2019). We note that these proposals are compatible with our argument, which merely requires that the classic semantics for wh-questions is an available interpretation, not that it is the only available interpretation.

On the classic analysis, the extension of (24) in w will be (29). Assuming again that w has the restricted inventory of places and people considered above, this amounts to the four-membered Hamblin set in (30).

(29) $\{\lambda w\text{: }\text{MURDER}_w(x).\ \text{KNOW}_w(y,\ \text{MURDER}(x)) \mid \text{PLACE}_w(x) \wedge \text{PERS}_w(y)\}$

(30) $\left\{ \begin{array}{l} \lambda w\text{: }\text{MURDER}_w(R).\ \text{KNOW}_w(I,\ \text{MURDER}(R)) \\ \lambda w\text{: }\text{MURDER}_w(R).\ \text{KNOW}_w(J,\ \text{MURDER}(R)) \\ \lambda w\text{: }\text{MURDER}_w(A).\ \text{KNOW}_w(I,\ \text{MURDER}(A)) \\ \lambda w\text{: }\text{MURDER}_w(A).\ \text{KNOW}_w(J,\ \text{MURDER}(A)) \end{array} \right\} = \left\{ \begin{array}{l} r_i \\ r_j \\ a_i \\ a_j \end{array} \right\}$

A comparison of (29) and (30) with (9) and (10) above reveals a commonality of the extensions of (24) and our classic factive island question in (8). In both cases, assuming there is a unique place of Caesar's murder, different presuppositions carried by different Hamblin answers are mutually incompatible. However, (29) and (30) differ from (9) and (10) in that they contain multiple Hamblin answers that carry *the same* presupposition. For example, (30) contains two different Hamblin answers presupposing that Caesar was murdered in Rome. So, the multiple wh-factive islands

differ from single wh-factive islands in that they fail to instantiate (for all accessible contexts c) the Uniqueness property in (11), repeated in (31). Instead, they merely instantiate a weaker property that we dub *Exclusivity*, stated in (32).

(31) *Uniqueness*
$\forall p,q[[p,q \in Q \wedge p \neq q] \rightarrow dom(p) \cap c \cap dom(q) = \emptyset]$

(32) *Exclusivity*
$\forall p,q[[p,q \in Q \wedge dom(p) \neq dom(q)] \rightarrow dom(p) \cap c \cap dom(q) = \emptyset]$

We can now demonstrate that Exclusivity is too weak a property to support necessary infelicity. We can do this by again constructing a suitable example to show that all felicity conditions can be met simultaneously by a question extension that instantiates Exclusivity. To do so, we first define *r.dom* as denoting the common domain of r_i and r_j, that is, as the proposition that Caesar was murdered in Rome; likewise, we define *a.dom* as denoting the common domain of a_i and a_j, that is, as the proposition that Caesar was murdered in Alexandria. Now consider the example context set c_0 := (r.dom−a.dom)∩($r_i \cup r_j$), the set of all worlds where Caesar was murdered in Rome and not in Alexandria, and where Ian or Jan knows that. We first observe that, $c_0 \cap$ a.dom $= \emptyset$ (i.e., c_0 entails that Caesar was not murdered in Alexandria), hence (30) and c_0 instantiate Exclusivity. Also, we have $c_0 \subseteq$ r.dom (c_0 entails that Caesar was murdered in Rome), so (30) and c_0 meet Answerability. Furthermore, since $c_0 \subseteq r_i \cup r_j$ (i.e., c_0 entails that Ian or Jan knows that Caesar was murdered in Rome), (30) and c_0 meet Existence. Finally, $c_0 \cap r_i \neq \emptyset$ and $c_0 \not\subseteq r_i$ (i.e., c_0 does not settle whether Ian knows that Caesar was murdered in Rome), so (30) and c_0 meet Informativity. Therefore, if the classic semantics for multiple wh-questions is available, then the intrinsic triviality analysis fails to capture the factive islandhood of multiple questions like (24).

To address the problems that arise from the intrinsic triviality analysis' reliance on Existence and Uniqueness, we will now spell out the proposal that factive islandhood can arise from necessary blocking, a proposal that does not make reference to either Existence or Uniqueness.

4 Factive islands from necessary blocking

The idea to be spelled bellow is that in any accessible context where a factive island question is otherwise felicitous, a competing question would have to be used instead. This proposal employs only one of the three felicity conditions introduced above, viz. Answerability, hence in particular does not rely on Existence. Moreover, it is not restricted to factive islands that instantiate Uniqueness, but it also applies correctly to cases that merely instantiate Exclusivity.

Section 4.1 introduces the analysis by applying it to factive islands with a single wh-phrase, without appealing to Existence; Section 4.2 applies the analysis to factive islands with multiple wh-phrases, which instantiate Exclusivity but not Uniqueness.

4.1 Blocking: Existence not required

To introduce the necessary blocking analysis, we return to our factive island question (14), repeated once again in (33). And we again confine attention to a possible world where Rome and Alexandria are the only places. In such a world, (33) has the set in (15) as its extension, repeated here as (34).

(33) *Where did they know [that Caesar was murdered __] ?

(34) $\left\{ \begin{array}{l} \lambda w\text{: } \textsc{murder}_w(R).\ \textsc{know}_w(\text{they}, \textsc{murder}(R)) \\ \lambda w\text{: } \textsc{murder}_w(A).\ \textsc{know}_w(\text{they}, \textsc{murder}(A)) \end{array} \right\} = \left\{ \begin{array}{c} r \\ a \end{array} \right\}$

We propose that (33) is blocked by a polar question obtained from (33) by replacing the wh-phrase with an expression referring to a place. A pair of such questions is shown in (40), where *in Rome* or *in Alexandria* substitutes for *where*. Under the classic analysis of polar questions (e.g., Karttunen 1977), the extensions of those polar questions are the sets in (36).

(35) a. Did they know that Caesar was murdered in Rome?
b. Did they know that Caesar was murdered in Alexandria?

(36) a. $\left\{ \begin{array}{l} \lambda w\text{: } \textsc{murder}_w(R).\ \ \textsc{know}_w(\text{they}, \textsc{murder}(R)) \\ \lambda w\text{: } \textsc{murder}_w(R).\ \neg\textsc{know}_w(\text{they}, \textsc{murder}(R)) \end{array} \right\} = \left\{ \begin{array}{c} r \\ -r \end{array} \right\}$

b. $\left\{ \begin{array}{l} \lambda w\text{: } \textsc{murder}_w(A).\ \ \textsc{know}_w(\text{they}, \textsc{murder}(A)) \\ \lambda w\text{: } \textsc{murder}_w(A).\ \neg\textsc{know}_w(\text{they}, \textsc{murder}(A)) \end{array} \right\} = \left\{ \begin{array}{c} a \\ -a \end{array} \right\}$

Which polar question will block (33)? We take the answer to depend on the context. Specifically, in a context where the extension of (33), shown in (34), meets Answerability, a blocking question will be one whose extension also meets Answerability. There are two types of accessible contexts where (33) meets Answerability: *type R* contexts entail r.dom–a.dom (i.e., that Ceaser was murdered in Rome, and not in Alexandria), and *type A* contexts entail a.dom–r.dom (i.e., that he was murdered in Alexandria, and not in Rome). In contexts of type R, the extension of (35a), shown in (36a), will meet Answerability, while the extension of (35b), shown in (36b), will not. In contexts of the type A, it is the other way around. Hence, we propose that (35a) is the blocking question in type R contexts, while (35b) is the blocking question in type A contexts.

On what grounds should the questions in (35) be expected to block (33)? Our

answer begins with the observation that in the relevant context, the proposed blocking question has no less potential for soliciting information than (33) itself. In Section 2, we defined the notion of a Hamblin set's active core in a context, viz. as the set of those Hamblin answers whose presupposition is compatible with the context. Any Hamblin answer outside a question's active core, in virtue of having a presupposition that is incompatible with the context, is excluded as a candidate for being offered in a felicitous response. We note moreover that, if the active core of a question Q1 is a subset of the active core of a question Q2, then this amounts to Q2 having no less potential for information gain than Q1. This is because any Hamblin answer that might be offered in a felicitous response to Q1 could also be offered in a felicitous response to Q2. We now observe that the active core of (34) in a type R context is the singleton Hamblin set {r}. {r} is a subset of (36a), the extension of (35a). In a type R context, (36a) itself is the active core of (36a). So in such a context, the active core of (34) is a subset of the active core of (36a). In type R contexts, therefore, (35a) has no less potential for information gain than (33), and it should therefore be an option for a rational speaker to use (35a) instead of (33).

Symmetrically, the active core of (34) in a type A context is the singleton {a}, a subset of (36b), which is the extension of (35b) and its own active core in a type A context. So in type A contexts, (35b) has no less potential for information gain than (33), and hence it should be an option for the speaker to use (35b) instead of (33).[2]

But why would it be obligatory, as opposed to merely permitted, for the speaker to use one of the questions in (35) instead of (33)? That is, why do the questions in (35) block (33), as opposed to freely alternating with (33)? In what sense are the proposed blocking questions *better* than the question they are proposed to block? We offer two different answers, which are compatible with each other and that we think may both be correct. First, the questions in (35) may be better than (33) in virtue of being syntactically less marked. We speculate that, all else equal, a

2 Arguing against the classic analysis of polar questions, Biezma & Rawlins (2012) propose that polar questions denote singleton sets, whose sole member is the proposition given by the question's affirmative answer. Under this view, the sets in (36a) and (36b) would be replaced with the singletons {r} and {a}, respectively. In the relevant contexts, the active core of (34) would then not merely be included in, but would in fact be equal to, the active core of (36a) or (36b). This change would fully preserve the rationale for necessary blocking presented in the text. In fact, it would render the case of single wh-factive islands more fully parallel to the case of multiple wh-factive islands analyzed in the next subsection – as we will see, in those cases the active cores of the blocking questions will be identical to the active core of the question to be blocked.

Notably, however, Biezma & Rawlins's singleton analysis of polar questions is not compatible with the conditions in (12), assumed in the intrinsic triviality analysis as elaborated in Section 2. In particular, any singleton Hamblin set is bound to violate either Existence or Informativity. The arguments for the singleton analysis (presented by Biezma & Rawlins) could therefore be potentially construed as arguments against the intrinsic triviality analysis. (Thanks to Aron Hirsch for discussion of this point.)

polar question is less marked than a wh-question.[3] Second, the blocking question in (35) may be better than (33) in virtue of the Maximize Presupposition principle articulated in Heim 1991. Maximize Presupposition demands that the speaker choose the presuppositionally stronger of two utterances with otherwise comparable content, provided that the stronger presupposition is actually met. Note now that the questions in (35a) and (35b) are intuited to presuppose that Caesar was murdered in Rome and Alexandria, respectively. This intuition is in fact predicted by the Answerability condition, which effectively encodes existential projection of presuppositions from Hamblin sets. For (33), in contrast, the Answerability condition merely predicts the weaker presupposition that Caesar was murdered in Rome or Alexandria.[4] Moreover, the observed presupposition of (35a) is met in contexts of type R, the contexts where we have proposed (35a) blocks (33). Maximize Presupposition therefore demands that in type R contexts, the speaker use (35a) instead of (33). Likewise, the observed presupposition of (35b) is met in contexts of type A, the contexts where we have proposed (35b) blocks (33). Maximize Presupposition therefore requires that in type A contexts, the speaker use (35b) instead of (33).

In sum, and extrapolating from the particular example discussed, we propose that in any context where a single wh-factive island question would otherwise be felicitous, it is blocked by a felicitous polar question where a referring term replaces the wh-phrase. The blocking question matches the factive island question in potential for information gain, and it is moreover better than the factive island question in virtue of being syntactically less marked and/or in virtue of being presuppositionally stronger. So, factive island questions are analyzed as being unacceptable in virtue of being necessarily blocked by better questions.

Importantly, this account does not make reference to wh-questions' existence presupposition, the presupposition derived by Existence. It is thereby immune to objections based on the observation that the (purported) existence presuppositions is easily denied in conversation. By the same token, the necessary blocking account extends to factive islandhood in examples with *if any* like those in (37), repeated from (18). Hence the necessary blocking analysis addresses the potential problem of undergeneration of factive islands that we identified in Section 3.1.

3 Syntactic markedness or complexity has been appealed in the analysis of other phenomena related to meaning. One well-known example is Hurford's Constraint (Hurford 1974), the oddness of disjunctions like *It is raining hard or it is raining*, where disjuncts stand in a (semantic or pragmatic) entailment relation. In a school of thought that can be traced to Stalnaker 1975, such a disjunction is odd in virtue of being equivalent to the weaker disjunct on its own (here *It is raining*), while being syntactically more marked or complex than that disjunct.

4 This holds if the presupposition of a sentence is identified with the strongest proposition entailed by every context where it is felicitous, or, equivalently, with the union of all the contexts where the sentence is felicitous.

(37) a. *From whom, if anyone, do you regret [having gotten this letter __]?
b. *Who, if anyone, does Max know [that Alice got married to __ on June 1st]?
c. *Where, if anywhere, did they know [that Caesar was murdered __] ?

What remains to be seen is whether it fully solves the undergeneration problem we have described, that is, whether it also applies to multiple-wh factive islands of the sort introduced in Section 3.2. In the next subsection, we demonstrate that the account indeed extends to those factive islands as well. This demonstration establishes that the blocking account does not rely on Uniqueness, but only on the weaker property of Exclusivity.

4.2 Blocking: Uniqueness not required

We return to our multiple-wh factive island question (24), repeated in (38), and we again confine attention to a possible world where Rome and Alexandria are the only places and where Ian and Jan are the only people. The extension of (38) in such a world is given (39), which repeats (30).

(38) *Who knew [that Caesar was murdered where]?

(39) $$\left\{ \begin{array}{l} \lambda w\text{: } \textsc{murder}_w(R).\ \textsc{know}_w(I, \textsc{murder}(R)) \\ \lambda w\text{: } \textsc{murder}_w(R).\ \textsc{know}_w(J, \textsc{murder}(R)) \\ \lambda w\text{: } \textsc{murder}_w(A).\ \textsc{know}_w(I, \textsc{murder}(A)) \\ \lambda w\text{: } \textsc{murder}_w(A).\ \textsc{know}_w(J, \textsc{murder}(A)) \end{array} \right\} = \left\{ \begin{array}{l} r_i \\ r_j \\ a_i \\ a_j \end{array} \right\}$$

We propose that (38) is blocked by some wh-question with a single wh-phrase, one that can be obtained from (38) by replacing the in situ wh-phrase *where* with an expression referring to a place. A pair of such questions is shown in (40), where *in Rome* or *in Alexandria* substitutes for *where*.

(40) a. Who knew that Caesar was murdered in Rome?
b. Who knew that Caesar was murdered in Alexandria?

The rationale for the proposal that these questions block (38) is transparently parallel to the rationale laid out for classic factive islands in the preceding subsection. We begin with the issue of which of the wh-questions in (40) will block (38). Again we take this to depend on the context. Specifically, in a context where the extension of (38), shown in (39), meets Answerability, a blocking question will be one whose extension also meets Answerability. There are two types of accessible contexts where (39) meets Answerability, contexts of Type R and those of Type A. In contexts of type R, the extension of (40a), shown in (41a), will meet Answerability, while

the extension of (40b), shown in (41b), will not. In contexts of the type A, it is the other way around. Hence, we propose that (40a) is the blocking question in type R contexts, while (40b) is the blocking question in type A contexts.

(41) a. $\left\{ \begin{array}{l} \lambda w\text{: } \textsc{murder}_w(R).\ \textsc{know}_w(I, \textsc{murder}(R)) \\ \lambda w\text{: } \textsc{murder}_w(R).\ \textsc{know}_w(J, \textsc{murder}(R)) \end{array} \right\} = \left\{ \begin{array}{l} r_i \\ r_j \end{array} \right\}$

b. $\left\{ \begin{array}{l} \lambda w\text{: } \textsc{murder}_w(A).\ \textsc{know}_w(I, \textsc{murder}(A)) \\ \lambda w\text{: } \textsc{murder}_w(A).\ \textsc{know}_w(J, \textsc{murder}(A)) \end{array} \right\} = \left\{ \begin{array}{l} a_i \\ a_j \end{array} \right\}$

On what grounds should the questions in (40) be expected to block (38)? We begin by observing that the active core of (39) in a type R context is the Hamblin set in (41a), which is also the extension of (40a) as well as its active core in a type R context; so in type R contexts, (40a) has no less (in fact, the same) potential for information gain as (38). In type R contexts, therefore, it should be an option for a rational speaker to use (40a) instead of (38). Symmetrically, the active core of (39) in a type A context is (41b), which is also the extension of (40b) as well as its active core in a type A context; so in type A contexts, (40b) has no less (in fact, the same) potential for information gain as (38). In type A contexts, then, it should be an option for the speaker to use (40b) instead of (38).

Why would it be obligatory for the speaker to use one of the questions in (40) instead of (38)? What makes the proposed blocking questions better than the question they are proposed to block? Again, we propose that the questions in (40) may be better than (38) in virtue of being syntactically less marked or complex. We speculate that, all else equal, a single-wh question is less marked than a multiple wh-question. Also, the relevant blocking questions in (35) may be better than (38) in virtue of Maximize Presupposition. As predicted by the Answerability condition, the questions in (35a) and (35b) are intuited to presuppose that Caesar was murdered in Rome and Alexandria, respectively. For (38), in contrast, the Answerability condition merely predicts the weaker presupposition that Caesar was murdered in Rome or Alexandria. Moreover, the observed presupposition of (40a) is met in contexts of type R, the contexts where we have proposed (40a) blocks (38). Maximize Presupposition therefore demands that in type R contexts, the speaker use (40a) instead of (38). Likewise, the observed presupposition of (40b) is met in contexts of type A, the contexts where we have proposed (40b) blocks (38). Maximize Presupposition therefore requires that in type A contexts, the speaker use (40b) instead of (38).

We conclude that necessary blocking provides a viable rationale for the unacceptability of both single wh-factive island questions, which instantiate Uniqueness, and multiple wh-factive island questions, which merely instantiate Exclusivity.

This finding raises a question about the logical profile of Hamblin sets that are

subject to necessary blocking. For the sake of basic descriptive adequacy, we want to make sure that the account does not overgenerate factive islands. That is, we want to make sure that necessary blocking is predicted only for questions that instantiate Exclusivity, as opposed to, say, any old question whose Hamblin answers carry presuppositions.

To confirm that this is indeed the case and that there is no overgeneration of factive islands, we return to the question in (5) above and its extension (7) in a world where Ian and Jan are the only people, repeated here as (42) and (43).

(42) Who regretted nominating themselves?

(43) $\left\{ \begin{array}{l} \lambda w\text{: } \textsc{nominate}_w(I,I).\ \textsc{regret}_w(I,\ \textsc{nominate}(I,I)) \\ \lambda w\text{: } \textsc{nominate}_w(J,J).\ \textsc{regret}_w(J,\ \textsc{nominate}(J,J)) \end{array} \right\}$

Assuming that there are accessible contexts where both Ian and Jan nominated themselves, the question in (42) does not instantiate Exclusivity. As a consequence, the polar questions in (44), whose extensions are given in (45), do not in all accessible contexts match (42) in information gain potential. While (43) may contain true Hamblin answers reporting on both Ian's and Jan's regrets, the true Hamblin answer in (45a) and (45b) necessarily remains silent on Jan's and Ian's regrets, respectively.

(44) a. Did Ian regret nominating himself?
b. Did Jan regret nominating herself?

(45) a. $\left\{ \begin{array}{l} \lambda w\text{: } \textsc{nominate}_w(I,I).\ \ \textsc{regret}_w(I,\ \textsc{nominate}(I,I)) \\ \lambda w\text{: } \textsc{nominate}_w(I,I).\ \neg\textsc{regret}_w(I,\ \textsc{nominate}(I,I)) \end{array} \right\}$

b. $\left\{ \begin{array}{l} \lambda w\text{: } \textsc{nominate}_w(J,J).\ \ \textsc{regret}_w(J,\ \textsc{nominate}(J,J)) \\ \lambda w\text{: } \textsc{nominate}_w(J,J).\ \neg\textsc{regret}_w(J,\ \textsc{nominate}(J,J)) \end{array} \right\}$

Necessary blocking, then, is predicted to be restricted to questions that instantiate Exclusivity, correctly delineating the range of cases where factive islandhood is and is not attested.

5 Conclusion

The intrinsic triviality analysis of factive islandhood proposed in Oshima 2007 and Schwarz & Simonenko 2018a assumes that factive island questions carry an existence presupposition, and it also assumes that no two Hamblin answers in a factive island question's extension carry the same presupposition. We have presented novel data suggesting that factive islandhood is attested in certain questions that do not carry an existence presupposition, and in certain questions whose extension can include multiple Hamblin answers with the same presupposition. In such cases, the intrinsic triviality analysis suffers from a (potential) problem of undergenerating factive

islands. Accommodating the (potentially) problematic novel data, we have proposed a more general rationale for the unacceptability of factive islands, under which unacceptability is due to the relevant questions being blocked by better questions in all accessible contexts.

We note that our arguments pose no immediate threat to the assumption that intrinsic triviality results in unacceptability. However, if the necessary blocking analysis is accepted, then it follows that factive islands do not actually furnish direct evidence for this assumption.

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