Local Pragmatics Redux: Presupposition Accommodation and Non-Redundancy Without Covert Operators*

Keny Chatain[a], Philippe Schlenker[a,b]

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Abstract. On several occasions in recent linguistic research, operations that used to be considered part of pragmatics were syntacticized: a covert operator was postulated to enrich the meaning of some constituents as part of compositional semantics. Three cases in point are Chierchia, Fox and Spector's exhaustivity operator O, used to compute local implicatures; Bochvar's assertation operator A, used to compute local accommodation of presuppositions; and more recently, Blumberg and Goldstein's non-redundancy operator R, used to capture cases of intrusion of non-redundancy conditions in the truth conditions. A key benefit of syntacticization is to explain why these operations can be performed in the scope of various operators, something that is not easy to conceptualize within standard Gricean pragmatics. But are these operators syntactically real? We develop tests based on ellipsis and argue that the answer is negative for Bochvar's A as applied to presupposition accommodation, and for Blumberg and Goldstein's R applied to non-redundancy. In the spirit of Recanati's 'free enrichment', we develop an alternative analysis of presupposition accommodation. It is based on a generalization of domain restriction, which we take to apply not just to nominal elements but, when needed, to verbal elements as well. We further argue that some of Blumberg and Goldstein's non-redundancy conditions can be analyzed within a generalization of accommodation theory and can thus be reduced (operator-free) to the preceding case. Besides these results, our analysis raises more general questions: Which pragmatic operators are syntactically real and which are not? And what should be inferred from this typology about the architecture of the semantics/pragmatics interface?

Keywords: semantics, pragmatics, operators, semantics/pragmatics interface, local implicatures, local accommodation, non-redundancy

* Note: This (non-final) version does not take into account later comments we received from colleagues.

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[a] Institut Jean-Nicod (ENS - EHESS - CNRS), Département d'Etudes Cognitives, Ecole Normale Supérieure, Paris, France; PSL Research University.
[b] New York University, New York.

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1 Pragmatic Operations and Covert Operators

On several occasions in recent linguistic research, operations that used to be considered part of pragmatics were syntacticized: A covert operator was postulated to enrich the meaning of some constituents as part of compositional semantics. A key benefit of syntacticization was to explain why these operations can in some cases be performed in the scope of various operators, something that is not easy to conceptualize within standard Gricean pragmatics.

But are these operators syntactically real? We develop tests based on ellipsis and argue that the answer is negative for two important cases: presupposition accommodation, syntacticized by way of Bochvar's assertion operator A, which turns undefinedness into falsity (Beaver 2001, Beaver and Krahmer 2001, Fox 2013); and a non-redundancy operator, R, postulated by Blumberg and Goldstein 2021a,b to account, among others, for the intrusion of non-redundancy conditions in truth conditions. We argue that both cases should be handled without operators and by way of a variety of local pragmatic enrichment, a view proposed for different cases by Recanati ('free enrichment', e.g. Recanati 2003). Specifically, we take as our model restrictions on quantifier domains, standardly used to explain why *nobody stopped smoking* just means that nobody *in a salient domain D* stopped smoking. We generalize these restrictions to verbal elements: Under some pragmatic conditions, *stopped smoking* could come to mean *belongs to a salient domain G* and stopped smoking. This provides an analysis of presupposition accommodation without operators. We will argue that some of Blumberg's and Goldstein's cases can be reduced (in several steps) to presupposition accommodation, thus offering an operator-free account of some of these cases as well.

1.1 The story of O

Famously, Chierchia 2004 argued that some scalar implicatures are computed locally, in the scope of various logical operators.[1] This finding was unexpected in view of the neo-Gricean view, on which a sentence *S* triggers the implicature than an alternative *S*' is false if *S*' is more informative and hence cooperative than *S* – something that does not make sense for non-sentential constituents (e.g. Horn 1972). Chierchia originally revised the interpretive procedure so as to allow scalar implicatures to be computed in tandem with compositional interpretation. Soon after, however, the same facts were handled instead by postulating a covert operator O, which as a first approximation is a presupposition-less (and covert) version of *only* (e.g. Chierchia et al. 2012).

While there are multiple arguments for O, one of the most convincing pertains to Hurford's constraint, the observation that in configurations such as (1)a, deviance is obtained if the second disjunct entails the first. But when a scalar term appears in the first disjunct, as in (1)b, the constraint is apparently obviated. This can be explained if the constraint is still in force, but the meaning of the first disjunct has been strengthened by a local implicature implemented through O, as in (1)c; in its presence, the first disjunct means in essence *Ann only read some of the books*, and it is not entailed by the second disjunct any longer.

(1) a. #Ann lives in France or in Paris.
b. Ann read some of the books or she read all the books.
c. O [Mary read some of the books] or she read all of the books.

Besides Hurford's constraint, a key reason standard Gricean semantics has seemed hopeless to deal with local implicatures in that in some cases these yield a reading that does *not* entail the implicature-free one, as in (2)a, which can have the reading in (2)b (Chemla and Spector 2011). Because *exactly one* is non-monotonic, enriching the main predicate does not give rise to a stronger overall reading.

[1] Landman 2000 and Schwarz 2001 independently explored related ideas.

(2) a. Exactly one letter is connected with some of its circles.
b. exactly one letter λx O [t_x is connected with some of its_x circles]

Recanati 2010 proposes that local implicatures are neither syntactic nor semantic in nature, but fall under a more general category of 'modulation', a process whereby semantic values are modulated before they enter compositional evaluation. Modulation can turn the 'animal' meaning of *lion* in (3)a into a 'statue' meaning. Similarly, it can turn the literal meanings of *city* and *asleep* in (3)b into extended or metaphorical ones: since a set of buildings cannot be asleep, either *city* must come to refer to its inhabitants, or *asleep* must come to mean something like *quiet and showing little activity*.

(3) a. There is a lion in the middle of the piazza.
b. The city is asleep.
(Recanati 2010 pp. 5 and 41)

Recanati 2010 proposes that local implicatures are a subcase of modulation called 'free enrichment', whereby an expression "is contextually given a more specific interpretation than it literally encodes" (p. 168). The architecture Recanati proposes is somewhat reminiscent of Chierchia's (2004) initial attempt, with modulation affecting meanings before they enter semantic composition.

While the syntactic view has become dominant (in part due to its perspicuity), the debate between the operator-full and the operator-free version of local implicatures has never been fully addressed, possibly for three reasons. First, in view of the broader debate about the *existence* of local implicatures, deciding among various implementations seemed less than urgent. Second, the data that could bear on the debate are typically very subtle (in a nutshell, they involve the interaction of local implicatures and ellipsis-like tests). Third, there are now so many versions of local implicature theory (implemented by way of slightly different exhaustivity operators) that considering the full set of theoretical possibilities requires significant work.

While the conclusion of the story of O hasn't been written yet, the same general debate has arisen in cases in which a clear answer can be found, one that goes against the syntactic reality of pragmatic operators. One debate pertains to presupposition accommodation, and the other to instances of intrusion of non-redundancy conditions in truth conditions.

1.2 The story of A

In a landmark study of presupposition projection, Heim 1983 distinguished between two repair strategies that might be invoked when a presupposition fails to be satisfied, as in (4) (we replace *France* with *Syldavia* in Heim's example to increase the chance that one doesn't have beliefs about the country's constitutional system).

(4) The king of Syldavia didn't come.

One strategy, global accommodation, might just follow from Gricean pragmatics: the addressee computes the presupposition as required by projection rules, sees that in view of her beliefs the sentence should give rise to a failure, and adapts her beliefs to avoid this unfortunate outcome. Concretely: Heim's dynamic semantics was based on update rules such as (5), which specify how the context of evaluation of an expression is updated in view of the semantic value of its constituent parts. For atomic elements, one can take for granted a static trivalent semantics, writing $\mathbf{p}(w)$ for the value of a propositional expression *p* at world w, and state how failure at a world determines presupposition failure in a context, as in (5)a. Rules such as (5)b further specify how the update of a complex expression is determined on the basis of the update of its parts.

(5) If p is an atomic proposition expression and if F is a (possibly complex) propositional expression:
a. $C[p] = \#$ iff for some $w \in C$, $\mathbf{p}(w) = \#$. If $\neq \#$, $C[p] = \{w \in C: \mathbf{p}(w) = 1\}$
b. $C[\text{not } F] = \#$ iff $C[F] = \#$; if $\neq \#$, $C[\text{not } F] = C - C[F]$

Applying (5) to (4), we obtain the condition that C should guarantee the existence of a king of Syldavia. The addressee sees that this condition isn't satisfied by C, and adjusts her beliefs to ensure that the condition is satisfied in a more restrictive context C^+ that entails that Syldavia has a king. The update operation applies to that strengthened context, as illustrated in (6)a. If C^+ is the *minimal* strengthening of C that satisfies the presupposition, it has the value in (6)b, and after global accommodation and update, it follows that Syldavia is a monarchy.

(6) a. C[not the king of Syldavia came] –global accommodation→ C^+[not the king of Syldavia came] = C^+ - C^+[the king of France came]
b. C^+ = C[France has a king]
c. Result of global accommodation:
C[France has a king] - C[France has a king][the king of France came] = {w ∈ C: in w, France has a king and the king of France came}
d. Static trivalent semantics: For any world w, **the king of Syldavia came**(w) = # unless there is a unique king of Syldavia in w. If ≠ #, = 1 iff the king of Syldavia came in w.

This monarchist conclusion might be hard to swallow if one is talking about France rather than Syldavia – or if one believes that Syldavia is a republic. But fortunately, Heim offers an alternative, local accommodation, which does not affect the global context of evaluation (that of the entire negative sentence) but just the immediate context of the trigger (that is, the local context of the clause *the king of France came*). This gives rise to the result in (7)a, where local accommodation and update combined do not entail that France has a king. The sentence then means in essence: *It's not the case that France has a king and that he came*, where the underlined conjunct is the contribution of local accommodation. Local accommodation is usually assumed to be a last resort that is only employed in case global accommodation leads to unacceptable results.

(7) a. C[not the king of France came] –local accommodation→ C - C^+[the king of France came]
b. C^+ = C[France has a king]
c. Result of local accommodation:
C - C[France has a king][the king of France came] = {w ∈ C: in w, it's not the case that France has a king and he came}

While non-committal about the implementation, Heim seemed to view local and global accommodation alike as pragmatic in nature. Clearly, however, local accommodation is not an operation that invariably strengthens the meaning of the target sentence. Without local accommodation, if (4) is true, then Syldavia has a king, but this entailment disappears when local accommodation is applied. This suggests, rather unsurprisingly, that local accommodation is not a Gricean-style operation that enriches the global meaning.

It was later proposed that local accommodation could be viewed in terms of the optional insertion of an operator that turns undefinedeness, notated as #, into falsity, notated as 0 (Beaver 2001). This operator corresponds to Bochvar's (1939) meta-assertion operation (developed for trivalent logics in general), and it is correspondingly notated as A. In Beaver's words, "the meta-assertion of *F*, *AF*, is the proposition that *F* is true"[2], and it can be defined as in (8). This operator can be applied to a variety of trivalent logics, including to the trivalent core of Heim's dynamic semantics.

(8) *AF* has the value 1 iff *F* has the value 1; otherwise, *AF* has the value 0.

On this operator-based view, local accommodation is just the insertion of A above an elementary propositional expression. This can be applied in Heim's framework, with the Logical Form in (9)a, and the result in (9)b, which is equivalent in this case to Heim's original recipe. (Importantly, there are non-dynamic trivalent accounts of presupposition projection, and those may borrow Bochvar's A without making use Heim's intrinsically dynamic operation.[3])

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[2] Beaver 2001 p. 37 (we replaced Φ with *F* in the quote).
[3] For static trivalent accounts of presupposition projection, see for instance Peters 1979, Krahmer 1998, Fox 2008, George 2014.

(9) a. not A [the king of France came]
b. If $C \neq \#$, C[not A[the king of France came]] $\neq \#$, and C[not A[the king of France came]] = C - C[A[the king of France came]] = {w $\in$ C: in w, it's not the case that France has a king and he came}
c. **A[the king of Syldavia came]**(w) = 1 iff in w there is a unique king of Syldavia and in came; = 0 otherwise.

Our main argument against A will be that when ellipsis tests are applied, as in (10), it becomes very dubious that A is syntactically real.

(10) *Context:* we're supposed to take the lab rat out of its cage once every day. Otherwise, it gets stressed. Bill has been unreliable with this task.
Ann: Last Monday, Bill didn't take the lab rat out of its cage.
($\rightsquigarrow$ last Monday, the rat was initially in its cage)
Sue: He didn't on Wednesday either but that's just because I had it at home on Tuesday and forgot to bring it back so it wasn't in the cage at all that day.

The first sentence of (10) gives rise, despite the negation, to an inference that the lab rat was in the cage. This suggests that *take out of its cage* triggers the presupposition that the rat was in the cage, and crucially that no occurrence of A appears below negation. But under standard assumptions about ellipsis, the elided clause is obtained by copying the boxed antecedent. Since this boxed constituent doesn't contain A, neither does the elided clause. This predicts that the presupposition of the elided clause cannot be locally accommodated, which should give rise to a contradiction in view of the *because*-clause. Since no such contradiction is obtained, local accommodation seems to be possible in the elided clause—but this seems to argue against the operator-based account.

1.3 The story of R

The use of a disjunction *A or B* is typically deviant unless the context leaves open that *A* might be true or false, and similarly for B. Blumberg and Goldstein 2021a,b argue that such non-triviality conditions sometimes permeate the truth conditions, as in (11).

(11) *Context:* There are three detectives: one has already ruled out Ann and is certain that Bill is the culprit,[4] but the others don't know anything yet.

Exactly two detectives believe/hope/fear that Ann or Bill committed the crime.
(Blumberg and Goldstein 2021a)

An accurate paraphrase of the truth conditions seems to be: exactly two detectives (i) believe that at least one of Ann and Bill committed the crime, and (ii) leave open that Ann might or might not be the culprit, and similarly for Bill. Without (ii), it wouldn't be true that exactly two detectives satisfy the condition, since all three satisfy (i). In other words, the non-triviality conditions that apply to an utterance of *A or B* seem to affect the truth conditions of the belief report.

In this and a series of rather different cases, Blumberg and Goldstein argue that a non-redundancy operator R can appear in Logical Forms. For reasons we'll come to later, they posit that in the positive case, the operator applies to the first disjunct of the embedded clause, yielding the simplified representation in (12)a. For the negative case, displayed in (12)b, the operator is not inserted at all. Finally, the desired reading of (11) is derived with the representation in (12)c, which again contains the non-triviality operator R.

(12) a. The detective believes that R[Ann <committed the crime>] or Bill committed the crime.
Paraphrase: The detective believes that at least one of Ann and Bill committed the crime, and leaves open whether Ann might or might not have committed the crime.
b. The detective doesn't believe that Ann <committed the crime>] or Bill committed the crime.
Paraphrase: The detective doesn't believes that at least one of Ann and Bill committed the crime,
c. Exactly two detectives believe that R[Ann <committed the crime>] or Bill committed the crime.

[4] The second conjunct is not present in Blumberg and Goldstein's handout (2021a), but it seems to be intended.

Paraphrase: Exactly two detectives believe that at least one of Ann and Bill committed the crime, and leave it open whether Ann might or might not have committed the crime.

Just as was the case for O and A above, the presence of R can yield readings that do not entail the corresponding R-free sentence. Such is the case in (12)c, in the scenario in (11): the sentence with R is true but the sentence without R is false because all three detectives believe (the literal meaning of) the disjunction.

Our main argument will be once again that when ellipsis tests are applied, the syntactic reality of R becomes dubious, due to examples such as (13).

(13) *Context:* There are three detectives: one has already ruled out Ann and is certain that Bill is the culprit, but the others don't know anything yet.
a. Exactly two detectives believe that Ann or Bill committed the crime, but no journalist believes that Ann or Bill committed the crime.
b. Exactly two detectives believe that Ann or Bill committed the crime, but no journalist does.

Due to ellipsis, the second conjunct of (13)b must be identical to the first with respect to the presence or absence of A. Not having A at all would make the first conjunct false in view of the context. Including A, as in (14)b, predicts that the sentence with ellipsis just couldn't get the reading that the sentence without ellipsis does. This seems to us to be an incorrect prediction.

(14) a. LF of (13)a
Exactly two detectives believe that A [Ann <committed the crime>] or Bill committed the crime, but no journalist believes that Ann or Bill committed the crime.
b. LF of (13)b
Exactly two detectives believe that A [Ann <committed the crime>] or Bill committed the crime, but no journalist does ~~believe that A [Ann <committed the crime>] or Bill committed the crime~~.

We will run the same tests on other purported uses of R, and reach in several cases the same conclusion: this operator is not syntactically real.

1.4 Data elicitation

Unless they are cited from the literature, the examples we discuss are original to this piece. English judgments come from extended one-on-one elicitation sessions with two native speakers of American English, who are also linguists (we reasoned that seasoned linguists would be more apt to judge some of the more difficult cases we discuss; for arguments in favor of this introspective method, see for instance Sprouse and Almeida 2012, 2013, Sprouse et al. 2013). The French data come from the authors' own judgments).

1.5 Plan

The rest of this article is organized as follows. In Section 2, we sketch a typology of different types of truth-conditional enrichments, some of which are 'seen' by ellipsis and some of which are not; in particular, we study the case of domain restrictions, which we will generalize to apply to verbal elements in addition to nominal ones ('generalized domain restrictions'). We turn to the local accommodation of presuppositions in Section 3 and lay out the ellipsis-based argument against A; it dovetails with an independent argument against A-based theories initially sketched in Romoli 2011. Both problems are solved by treating accommodation with generalized domain restrictions. The accommodation part of the argument is extended to intermediate accommodation in Section 4. We then develop an argument against the syntactic reality of Blumberg and Goldstein's R operator, and we cast doubt on the unity of the phenomena they discuss. In Section 5, we argue that their diversity inferences under attitude verbs should be handled (operator-free) by lexical presuppositions of the relevant verbs, following insights of Heim 1992. In Sections 6–7, we suggest that the ignorance inferences triggered by disjunction and conjunction under attitude verbs originate (also operator-free) from Stalnaker conditions of non-triviality, which are technically anti-presuppositions; these may under some pragmatic conditions be strengthened into presuppositions, which may intrude in at-issue truth conditions. Further examples of anti-presuppositions that intrude in assertions are discussed in Section 1, and conclusions are drawn in Section 8.

2 Ellipsis and the Typology of Truth-conditional Enrichments

In this section, we lay out examples illustrating how ellipsis interacts with various enrichments depending on their source (which may be a covert syntactic operator, a semantic rule, or a post-semantic enrichment). These examples serve as the foundation for the argument developed in later sections against a syntactic treatment of accommodation and redundancy. One of these examples, domain restriction, also serves to introduce our own analysis of these enrichments.

2.1 Syntactic vs. semantic parallelism requirements on ellipsis resolution

Ellipsis is subject to licensing conditions. It is commonly accepted that these include at the very least parallelism requirements—the elided site must, in some fashion, be parallel to its antecedent. Theories differ on the nature of the parallelism requirement. Depending on the approach, parallelism may be a parallelism of forms (*syntactic parallelism*) or of meanings (*semantic parallelism*). Rooth 1992 proposes that ellipsis is subject to *both* syntactic and semantic parallelism conditions. The ellipsis in (15) meets the syntactic parallelism condition, because the elided VP is syntactically identical to its antecedent. The two clauses also satisfy a form of semantic parallelism, spelled out in terms of focus values: the proposition expressed by the antecedent must belong to the focus value of the clause that contains the ellipsis site. Specifically, the antecedent expresses $5 \leq 5$ which is in the set of propositions $\mathbf{n \leq n}$, i.e. the focus value of the second clause. Together, these two parallelisms license the ellipsis displayed in (15).

(15) 5 is less than or equal to itself, and 7_F is <~~less than or equal to itself~~> as well.

To justify this dual syntactic and semantic requirement, Rooth offers an interesting contrast between ellipsis and downstressing. According to Rooth, downstressing only requires semantic parallelism to be licensed. In (16)b, the focus value of the downstressed clause (represented in subscripted font) is the set of proposition $n \leq n$, which contains the proposition expressed by the first clause; this mere semantic parallelism suffices to license downstressing. By contrast, ellipsis is more demanding, and as a result *less or equal to itself* in (16)a cannot be elided: While this phrase satisfies the semantic parallelism condition, it is not syntactically parallel to its antecedent.

(16) Logical Forms and semantic parallelism condition
a. *5 is less or equal to 5 and 4 isn't <~~less or equal to itself~~>.
b. 5 is less or equal to 5 and 4 isn't $_{\text{less or equal to itself}}$.
c. Semantic parallelism requirement
$\mathbf{5 \leq 5}$ must belong to $\{\mathbf{1 \leq 1}, \dots , \mathbf{5 \leq 5}, \dots, \mathbf{7 \leq 7}, \dots\}$

2.2 Applying the ellipsis test

The cases studies to be presented all involve an expression E that receives a stronger interpretation than expected by a simple-minded compositional semantics. In each case, this enriched semantics may be explained in different ways. A *syntactic* explanation attributes the unexpected meaning of E to the presence of a covert operator *Op*, with a non-contextual semantics (i.e. its denotation does not depend on parameters of the interpretation function). According to the *contextual* explanation, there is no covert operator in E, but the interpretation itself depends on more contextual parameters than meets the eye. The *post-semantic* explanation posits that the syntax and semantics of E are just as they appear, but that the meaning delivered by the composition is enriched through pragmatic reasoning in a post-semantic (and as yet unspecified) component[5].

[5] These are not the only logical possibilities.

(17) **Three analyses of local enrichment**

a. **Syntactic enrichment**
Syntactic form: Op E
Source of the enrichment: for some parameter p, $[\![\text{Op E}]\!]^{p}$ differs in meaning from $[\![E]\!]^{p}$

b. **Contextual enrichment**
Syntactic form: E
Source of the enrichment: for some parameters p, p', $[\![E]\!]^{p'}$ differs in meaning from $[\![E]\!]^{p}$

c. **Post-semantic enrichment**
Syntactic form: E
Source of the enrichment: for some parameter p, $[\![E]\!]^{+\,p}$ differs in meaning from $[\![E]\!]^{p}$, where $[\![\bullet]\!]^{+}$ is a (mysterious) pragmatic strengthening of $[\![\bullet]\!]$

With these three types of explanations in mind, we consider contexts in which E serves as the antecedent for an elided expression E'. We determine whether E' must receive an enriched meaning when E does. This critically depends on which of the explanations laid out above is correct. Importantly, these hypotheses about the origin of the enriched meaning come with different requirements for the semantic and especially syntactic parallelism conditions, as is summarized in the table in (18); the shaded row will be the crucial one for our argument.

(18) **Interaction between three analyses of local enrichment and ellipsis**
Analysis of an expression *E* that has a stronger meaning than a standard compositional analysis would lead one to predict.

	Syntactic enrichment (non-contextual *Op*)	**Contextual enrichment**	**Post-semantic enrichment**
Syntactic form	Op E	E	E
Semantics+pragmatics	Non-contextual semantics: **Op E** depends only the value **E** (not on the value of covert parameters)	Contextual semantics: **E** depends on the value of covert parameters	Non-contextual semantics with pragmatics: **E** is enriched by reasoning/pragmatic considerations
Syntactic parallelism	X Op E. Y_F <Op E>.	X E. Y_F <E>.	X E. Y_F <E>.
Semantic parallelism	**X Op E** is in the focus value of Y_F Op E.	**X E** is in the focus value of Y_F E.	**X E** is in the focus value of Y_F E.
Semantic result	Strict semantic parallelism	Functional semantic parallelism (i.e. parallelism *modulo* differences in contextual parameters)	No requirement of pragmatic parallelism

Due to these conflicting predictions, we can use ellipsis as a way to adjudicate between these competing theories of local enrichment. Our main argument takes the following form:
(i) postulating a covert operator Op predicts a syntactic parallelism that is not observed;
(ii) by contrast, an operator-free analysis using a contextual semantics makes the correct syntactic and semantic predictions (while not relying on the mysterious operation of post-semantic enrichment).[6]

The rest of this section illustrates each column of (18), with one example of post-semantic enrichment, one example of syntactic enrichment, and one example of contextual enrichment. In the presence of ellipsis, these will illustrate the schematic predictions of (18). In later sections, the ellipsis test will be applied to the phenomena of interest, namely presupposition accommodation and redundancy effects.

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[6] This argument may suffer from one flaw, however. In some cases, such as "sprouting", the parallelism requirements are a bit looser than strict identity. One may worry that such “looser” requirements might license the ellipsis when E contains a covert operator that E’ does not. This would make the ellipsis test uninformative. We discuss and dismiss this possibility in Appendix I.

2.3 Post-semantic enrichments

Discrepancies between the meaning delivered by the composition and the observed interpretation may be due to pragmatic processes, such as reasoning based on world knowledge, reasoning about communicative intentions, etc—all instances of *post-semantic enrichments*. By their nature, post-semantic enrichments should not be subject to the parallelism requirement, which only compare forms and *literal* meanings.

Conversational implicatures: In (19), a famous example by Grice, a conversational implicature is triggered: B implicates that Smith has, or may have, a girlfriend in New York. Grice noted that nothing in the overt or covert form of B's utterance conveys this inference as part of its meaning. Correspondingly, one expects that a sentence that copies the boxed VP by way of ellipsis, as in (20), need not give rise to the same implicature. This is as we observe: the elided VP does not give rise to the inference that Smith's sister has been paying a lot of visits to New York because she has a partner there (one may understand that she has been paying a lot of visits to New York because of e.g. her brother, but this is certainly optional).

(19) A: Smith doesn't seem to have a girlfriend these days.
B. He has $\boxed{\text{been paying a lot of visits to New York lately}}$.
(Grice 1975 p. 51)

(20) B: His sister has too – but not for the same reason.

Strengthened anti-presuppositions: A principle, called Maximize Presupposition, has been posited in recent research to explain why an expression such as *believe* gives rise to an inference that its complement is false. According to this principle, *believe* may only be used if its presuppositional alternative *know* is inapplicable because its presupposition is not met (e.g. Sauerland 2003, 2008; Percus 2006; Singh 2011; Schlenker 2012; Spector and Sudo 2017; Anvari 2018); the corresponding inference is sometimes called an anti-presupposition. The principle predicts that a use of *believe* triggers an inference to the effect that the presupposition of *know* does not hold (an *anti-presupposition*). But as Chemla 2008 notes, this inference is often insufficiently strong, as illustrated in (21) (where 'common belief' refers to the epistemic status of standard presuppositions).

(21) John believes that I have a sister.
a. Alternative: John knows that I have a sister.
b. Actual inference: The speaker does not have a sister.
c. Predicted inference: It is not common belief that the speaker has a sister.
(Chemla 2008)

Chemla proposes a purely reasoning-based mechanism of strengthening: by combining (21)c with independently plausible principles of epistemic logic, one gets in some desirable cases the stronger inference in (21)b.

If this analysis is correct, the stronger inference is a post-semantic enrichment. One expects, just as above, that the stronger inference could be invisible to the parallelism requirement. A VP copied through ellipsis might thus not need to be strengthened when its antecedent is. This is what we observe in (22): while A's utterance conveys that A does not have a boyfriend, B's utterance (on a sloppy reading) yields no such inference. By contrast, when the inference is made part of the literal meaning using the adverb *wrongly*, as in (23), the inference is preserved, with the result that B's reply sounds contradictory.

(22) A: I am under the impression that my landlord believes I have a boyfriend.
B: I am too – but unlike yours, my landlord is right!

(23) A. I am under the impression that my landlord wrongly believes I have a boyfriend.
B. #I am too – but unlike yours, my landlord is right!

In sum, we have seen two cases where post-semantic enrichments failed to be 'seen' by parallelism requirements on ellipsis, for reasons that followed from reasoning-based analyses. Crucially, these enrichments are relatively uncontroversial because they are applied globally (to an entire utterance) by reasoning on the speaker's belief state. The post-semantic enrichments discussed in the table in (18) would have to apply locally and their nature is correspondingly unclear.

2.4 Syntactic Enrichments

We call 'syntactic enrichments' cases in which an enrichment is due to the presence of a covert operator whose meaning does not depend on parameters of the context. Syntactic enrichments must count for both the syntactic and a semantic parallelism requirement on ellipsis. This implies that an elided phrase must have an enriched meaning if its antecedent does. We illustrate this fact with two examples.

Existential closure: It has been argued that in many languages, tense is ambiguous, with both an anaphoric and an existential reading (e.g. Grønn and von Stechow, 2016). A case in point is the French *passé composé*, which can carry the roles of both the English present perfect and the English simple past. In (24), the tense of the main clause may either be anaphoric to the tense of the relative clause or understood existentially. The two readings can be represented in simplified form in (25)a and (25)b, where we assume that existential quantifiers are dynamic, i.e. can bind variables outside of their c-command domain. The key difference is that in (25)b the main clause contains an existential quantifier that is missing from (25)a.

(24) Dans chaque ville que j'ai visitée, des balcons se sont effondrés.
In each city that I have visited, some balconies SE are collapsed
'In every city I visited, balconies collapsed.'
a. **Anaphoric reading : …** *collapsed during my visit*
b. **Existential reading :** … *collapsed at some point in the past*

(25) a. [every x: city x & [∃t: PAST t] I visit_t x] balconies collapse_t
b. [every x: city x & [∃t: PAST t] I visit_t x][∃t': PAST t'] balconies $\text{collapse}_{t'}$

While unpronounced, existential closure is often thought to be syntactically real and to involve covert quantifiers. The existential reading can thus be seen as a syntactic enrichment, and we expect that this enrichment will be copied by ellipsis. This is indeed the case: in the dialogue in (26), either both clauses yield an anaphoric reading or both yield an existential reading; mixing readings is not possible.

(26) A: Moi, dans chaque ville que j'ai visitée, des balcons se sont effondrés.
Me, in each city that I have visited, some balconies SE are collapsed
'In my case, in every city I visited, balconies collapsed.

B: Moi aussi!
Me too
In my case too!'

Generic and episodic indefinites: A related case is that of episodic/generic indefinites. In English, the same expression *a house in Beverly Hills* can be interpreted generically (as *all typical houses in Beverly Hills*) or episodically (as *there is a house in Beverly Hills such that…)*, as illustrated in (27). It is generally thought that the generic reading obtains through a covert GEN operator, which occurs in the generic but not in the episodic case, as seen in (28).

(27) a. Joshua thinks a house in Beverly Hills is huge. (generic)
b. Joshua thinks a house in Beverly Hills burnt down (episodic)

(28) a. Joshua thinks Gen$_x$ [a house in Beverly Hills]$_x$ is huge.
b. Joshua thinks that a house in Beverly Hills burnt down.

In (27), predicate choice and plausibility considerations disambiguate the reading of the generic. But other cases, such as (29), a genuine ambiguity is obtained, which can be lifted by adding information to the discourse..

(29) Joshua thinks a house in Beverly Hills costs more than $100 million
a. … so in his estimation, the whole neighbourhood has a value of at least $50 billlion (generic).
b. … so his goal in life is to buy it (episodic).

Because the choice of generic vs. episodic reading is conditioned by the presence of a covert operator GEN, it is predicted that an elided clause should be disambiguated in the same way as its antecedent. This is indeed what is found: forcing the disambiguation of the elided clause in favor of the episodic reading (= (30)a) or the generic reading (= (30)b) concomitantly imposes the same reading on the antecedent clause.

(30) Joshua thinks a house in Beverly Hills cost more than $100 million.
a. Mark does too and he hopes to buy it.
b. Mark does too so, according to his estimation, the whole neighboorhood has a value of at least $50 billion.

2.5 Contextual enrichments

Finally, we turn to a third way in which enriched meanings can arise: through a dependency on contextual parameters, which yields different meanings depending on the value of these parameters. We use implicit domain restrictions as a prime illustration of this type of enrichment.

A commonplace observation is that a naive semantics for (31) would require that all students in the world come to my office—an undesirable result. To avoid this consequence, one usually assumes that quantifiers are implicitly dependent on a contextually provided domain.

(31) Every student came to my office.

As has been noted by several authors (von Fintel, 1994; Schlenker, 2006), this contextually provided implicit domain may be functional and co-vary with an arbitrarily large number of variables. Thus in (32), the domain restriction for *part-time instructor* is dependent on the *dean* (different deans interact with different students) and the domain restriction for *most students* depends on both the *dean* and the *part-time instructor*.

(32) [Uttered in Los Angeles, a large city with many colleges and many part-time instructors]
Each dean forced each part-time instructor to give an A to most students. (Schlenker 2006)

The possibility of implicit and potentially functional domains has important repercussions on ellipsis and parallelism conditions. Consider the two sentences in (33)a, which intuitively make claims about two different sets of professors.

(33) a. MIT's dean met with every professor. Harvard's dean didn't.
b. **Simple parse:**
MIT's dean met with every$_C$ professor. not Harvard's dean <~~met with every$_C$ professor~~>.
c. **Functional parse:**
MIT's dean λx x metwith every$_{C(x)}$ professor. not Harvard's dean will <λx x ~~met with every$_{C(x)}$ professor~~> too.

Parsed with a single domain variable C, as in (33)b, the two sentences are syntactically identical. But to derive the intended reading, the value given to the domain restriction variable C must vary across the two clauses (presumably through context change), yielding a violation of the semantic parallelism condition. The problem is solved with the functional parse in (33)c, which satisfies both syntactic and semantic parallelism (for the latter, because the same function is defined by the two complex predicates). Assuming that the value of C is constant across the discourse, in (33)c the two clauses are both syntactically identical and semantically parallel. Ellipsis is thus predicted to be licensed. And because the λ-abstract takes different arguments, a different implicit restriction is obtained in the two clauses.

Since we will base our main proposal on domain restriction, we should be more specific about implementation, which gives rise to multiple options. In Stanley and Szabó 2000, implicit domain restrictions are syntactically represented with both domain variables and individual variables, as is the case in (33). But a purely semantic analysis can also be proposed, and for reasons of notational simplicity, it is the solution we opt for. According to this analysis, illustrated in (34) for the case of *most*, the meaning of quantifiers involves a contextually provided restriction R dependent on s, the assignment function. Because the assignment function contains values for all the binders in the syntactic context, the value of R may depend on any binders in the context, as was illustrated in (32).

(34) a. $[[\text{most}]]^{c,s,t,w}(f) = \text{most}'(\lambda d_e.\ \mathbf{R_{c,s,t,w}(f)(d) = 1}$ and $f(d) = 1$ **and**)
b. $[[\text{most student}]]^{c,s,t,w} = [[\text{most}]]^{c,s,t,w}([[\text{student}]]^{c,s,t,w})$
$= \text{most}'(\lambda d_e.\ R_{c,s,t,w}(\text{student}'_{t,w})(d) = \text{student}'_{t,w}(d) = 1)$

2.6 Proposal: Generalized Domain Restriction

In the rest of this piece, we will argue on the basis of ellipsis and related tests that accommodation and redundancy effects are not syntactic enrichments. We will propose instead that they should be viewed as contextual enrichments. To do so, we will generalize the mechanism of domain restriction seen in the previous section from the nominal to the verbal domain. Thanks to this generalization, some of the enrichments discussed later will be subsumed under this rule, thus making them *contextual enrichments*.

To be more specific, we propose a new rule of *Generalized Domain Restriction*, defined in (35)-(37). In essence, we redefine composition by reference to an auxiliary interpretation function $^{G}[[\bullet]]^{c,s,t,w}$, which just affects elementary predicative expressions:[8] it narrows down their extensions to those elements that satisfy a generalized restriction, and crucially this may affect nominal and verbal expressions alike (unlike standard domain restriction, which only affects nominals). In greater detail, (36)a states that G restricts the meaning of elementary predicative expressions, while (36)b states that G has no effect on other elementary expressions. And (37) ensures that composition rules (Function Application, Predicate Modification and Predicate Abstraction) are redefined so as to take into account the effect of G on the meanings they combine.

(35) **Assumption:** For any $n \geq 1$, any context c determines a generalized restriction R^n_c which can take an assignment function, a time and a world as additional arguments, where $R^n_{c,s,t,w}$ takes n individual arguments to yield a truth value.

Notation: For $n = 1$, we write $R_{c,s,t,w}$ instead of $R^n_{c,s,t,w}$.

(36) For any elementary expression a, for any context c, assigntment function t, and world w:
a. if $[[a]]^{c,s,t,w}$ has a predicative type (ending in <e, t>, <e, et>> or <e, <e, et>>), and requires n arguments of type e to yield a truth value,
$^{G}[[a]]^{c,s,t,w} = \lambda d_1 \dots \lambda d_n$. # iff $R^n_{c,s,t,w}(d_1, \dots, d_n) = 1$ and $[[a]]^{c,s,t,w}(d_1, \dots, d_n) = \#$; 1 iff $R^n_{c,s,t,w}(d_1, \dots, d_n) = 1$ and $[[a]]^{c,s,t,w}(d_1, \dots, d_n) = 1$;
b. otherwise, $^{G}[[a]]^{c,s,t,w} = [[a]]^{c,s,t,w}$.

(37) For any expressions a, b, for any context c, assigntment function t, and world w:
a. Function Application
If one of {a, b} has a type of the form $<\alpha, \beta>$ and the other has type α, then
$[[[a\ b]]]^{c,s,t,w} = {}^{G}[[a]]^{c,s,t,w}({}^{G}[[b]]^{c,s,t,w})$ or ${}^{G}[[b]]^{c,s,t,w}({}^{G}[[a]]^{c,s,t,w})$, whichever one is type-theoretically acceptable.

[8] One could explore a version of our system with Generalized Restriction applying to all expressions whose type 'ends in t'.

b. Predicate Modification
If a and b are both of type <e, t>, $[\![[a\ b]]\!]^{c, s, t, w} = \lambda x_e.\ \#$ iff $^G[\![a]\!]^{c, s, t, w}(x) = \#$ or $^G[\![b]\!]^{c, s, t, w}(x) = \#$; 1 iff $^G[\![a]\!]^{c, s, t, w}(x) = {}^G[\![b]\!]^{c, s, t, w}(x) = 1$.

c. Predicate Abstraction
If E = *such$_i$, who$_i$, which$_i$*, *i*, or *λi*,

$[\![[E\ F]]\!]^{c, s, t, w} = \lambda x_e.\ {}^G[\![F]\!]^{c, s[i \to x], t, w}$

To illustrate, the meaning of *most students* will be computed as in (38), which in the bivalent case yields the very same result as (34)b.

(38) $[\![[\text{most student}]]\!]^{c, s, t, w} = {}^G[\![\text{most}]\!]^{c, s, t, w}\ ({}^G[\![\text{student}]\!]^{c, s, t, w})$
$= [\![\text{most}]\!]^{c, s, t, w}\ (\lambda d_e\ .\ \#$ iff $R_{c, s, t, w}(\text{student}'_{t, w}, d) = 1$ and $\text{student}'_{t, w}(d) = \#$; 1 iff $R_{c, s, t, w}(\text{student}'_{t, w}, d) = \text{student}'_w(d) = 1)$
$= \text{most}'\ (\lambda d_e\ .\ \#$ iff $R_{c, s, t, w}(\text{student}'_{t, w}, d) = 1$ and $\text{student}'_{t, w}(d) = \#$; 1 iff $R_{c, s, t, w}(\text{student}'_{t, w}, d) = \text{student}'_w(d) = 1)$

On the assumption that $R_{c, s, t, w}(\text{student}'_{t, w}, \#) = 0$, this simplifies to:

$\text{most}'(\lambda d_e\ .\ 1$ iff $R_{c, s, t, w}(\text{student}'_{t, w}, d) = \text{student}'_{t, w}(d) = 1$; 0 otherwise)

This example shows that the mechanism proposed subsumes domain restriction as seen above. But it is more general: as we will see later, this rule can also serve as a model for local accommodation. To foreshadow these developments, local accommodation will be what happens when the domain restriction of a predicate is strong enough to meet its presupposition.

3 Presupposition Accommodation Without Operators I: Local Accommodation

We turn to our first target, the accommodation operator A. We argue that it is not syntactically real, and that its effects are better captured by way of Generalized Restriction.

3.1 Local accommodation obviates strict parallelism requirements

We start by investigating cases in which a certain VP triggers a presupposition that projects, while its elided counterpart leads to local accommodation of the same presupposition. By ensuring that the ellipsis site is high enough, we will rule out the possibility that local accommodation is effected by an operator.

Writing *X* and *Y* for the subjects, the target forms will have the form in (39)a, where the elided VP is enclosed within angle brackets, and where local accommodation is forced by a *because*-clause stating that subject Y doesn't satisfy the presupposition *P*. The key will be that if local accommodation were effected by an operator, it would have to be contained with the scope of negation and within the elided part. This would lead one to expect, contrary to fact, that A is present in the antecedent.

(39) a. X not <u>P</u>P'. Y too <not PP'> (because not Y P).
b. Impossible LF:
X not <u>P</u>P'. Y too <not **A** PP'>.

The English example in (40) has precisely this structure and seems felicitous; it makes use of the verb *take Y out of X,* which presupposes that *Y was in X*. Importantly, the first sentence, pronounced by Ann, is interpreted without local accommodation: our consultants infer that the rat was in its cage last Monday. This still allows for the application of local accommodation to the elided structure pronounced by Sue.

(40) *Context:* we're supposed to take the lab rat out of its cage once every day. Otherwise, it gets stressed. Bill has been unreliable with this task.
Ann: Last Monday, Bill didn't take the lab rat out of its cage.
(⇝ last Monday, the rat was initially in its cage)
Sue: He didn't on Wednesday either, but that's just because I had it at home on Tuesday and forgot to bring it back, so it wasn't in the cage to begin with.

The French example in (41)a is analogous, but has the advantage of allowing for a control (in (41)b) with a version of *be unaware* ('ignorer') that does not contain a negation (not even as a morpheme).[9] The latter results in incoherence because, for lack of a negation, global and local accommodation alike yield the inference that the students at the private school have real chances of success.

(41) *Context:* The speaker works at two separate schools to prepare students for competitive exams. One school is public and has excellent students, but they lack self-confidence. The other school is private and has terrible students.

a. Au	lycée	public, les élèves	ne	s'	aperçoivent	pas
At-the	*high-school*	*public, the students*	*NE*	*SE*	*notice*	*not*

qu'	ils	ont	de	réelles	chances	de	succès	aux	examens.
that	*they have*	*of*	*real*	*chances*	*of*	*success*	*to-the*	*exams*	

'At the public school, the students don't realize that they have real chances of success at the exams.

b. #Au	lycée	public, les élèves	ignorent
At-the	*high-school*	*public, the students*	*are-unware*

qu'	ils	ont	de	réelles	chances	de	succès	aux	examens.
that	*they have*	*of*	*real*	*chances*	*of*	*success*	*to-the*	*exams*	

'At the public school, the students are unware that they have real chances of success at the exams.

Continuation (for both a. and b.):

Au	lycée	privé	aussi –	mais	là	c'est	parce qu'	ils	n'	en ont aucune.
At-the	*high-school*	*private*	*too –*	*but*	*there*	*it is*	*because*	*they*	*NE*	*EN have none*

At the prive school too – but there that's because they don't stand a chance.'

3.2 Local accommodation vs. non-triggering: Homer's test

At this point an objection could be raised. Instead of claiming that a presupposition is triggered and then locally accommodated, one might posit that no presupposition was triggered in the first place. The possibility of non-generation of presuppositions on pragmatic grounds has a long history, going back at least to Stalnaker 1974. It has acquired new relevance in view of numerous recent proposals that argue that some or all presuppositions are generated by a productive algorithm working on top of bivalent (non-presuppositional) meanings, making the latter primitive (e.g. Abusch 2010, Abrusán 2011, Tonhauser et al. 2013, Schlenker 2021). If the foregoing examples involve non-triggering, they make our argument moot (but if so, they also cast doubt on the need for A in the first place, at least for local accommodation: non-triggering might be all we need).

Fortunately, Homer 2008 offers a possible criterion to distinguish between local accommodation and non-triggering. The criterion is developed in an article that develops a theory of presuppositional intervention on the licensing of Negative Polarity Items (NPIs). Homer notes that contrary to what one might expect on a simple-minded theory, intervention continues to make its effects felt even in the presence of local accommodation. Crucially, however, there are cases in which intervention disappears, and these can be analyzed as involving non-triggering rather than local accommodation.

A particularly minimal case is afforded by *s'apercevoir* in French: it yields intervention with local accommodation, as in (42). But when embedded in a counterfactual conditional (with the attitude

[9] One might try to construct a related control in English with *are oblivious of the fact that*, but it would involve a more complicated structure.

verb in the counterfactual imperfect and the embedded clause in the subjunctive), no intervention makes itself felt, as in (43).

(42) *Pierre ne s' aperçoit pas que Marie a la moindre chance, car elle n' a aucune chance.
Pierre NE SE perceives NEG that Marie has the slightest chance, for she NE has no chance
'Pierre doesn't realize that Marie has any chance, for she has no chance.' (Homer 2008)

(43) Si Pierre s' apercevait que Marie ait changé quoi ce soit, il serait en colère.
if Pierre SE perceived that Marie have.SUBJ changed anything, he would-be in wrath
'If Pierre found out that Marie changed anything, he would be mad.' (Homer 2008)

Homer's view is that the contrast makes sense if no presupposition is generated in (42) while one is locally accommodated in (43). This analysis dovetails with another fact: local accommodation is usually thought to be a last resort (Heim 1983), and in fact a variant of (42) without the NPI and without the *because*-clause, as in (44)a, does yield the inference that Marie has chances. Adding the *because*-clause forces the local accommodation reading, as in (44)b. By contrast, (45)a doesn't give rise to the inference that Marie changed things, and the same observation might extend to (45)b, with an embedded clause in subjunctive, which contrasts with (45)c, with an embedded clause in the indicative (why in this particular case the subjunctive induces non-triggering is a further question; for the present argument, all that matters is that it does).

(44) a. Pierre ne s' aperçoit pas que Marie a des chances.
Pierre NE SE perceives NEG that Marie has some chances
=> Marie has chances
'Pierre doesn't realize that Marie has chances.'
b. Pierre ne s' aperçoit pas que Marie a des chances, car elle n'en a aucune.
Pierre NE SE perceives NEG ghat Marie has some chances for she NE EN has none
≠> Marie has chances
'Pierre doesn't realize that Marie has chances because she has none.'

(45) a. Si Pierre s' apercevait que Marie ait changé des choses, il serait en colère.
if Pierre SE perceived that Marie have.SUBJ changed some things, he would-be in wrath
≠> Marie changed things
'If Pierre found out that Marie changed something, he would be mad.'
b. Pierre ne s'est pas aperçu que Marie ait changé des choses.
Pierre NE SE is NEG perceived that Marie have.SUBJ changed some things
≠>? Marie changed things
c. Pierre ne s'est pas aperçu que Marie a changé des choses.
Pierre NE SE is NEG perceived that Marie has changed some things
≠>? Marie changed things

Without seeking to provide a full account, we note that the intervention-inducing version of *s'apercevoir*, with an embedded indicative, is precisely the one we investigated in (41). The point can be made sharper by adding Homer's test to our target sentences, as in (46). This strongly suggests that the phenomenon we are assessing in (41) is indeed local accommodation rather than non-triggering: we *do* obtain NPI intervention in this case, which wouldn't be the case if non-triggering were at stake.

(46) Au lycée privé, les élèves ne s'aperçoivent pas qu' ils ont
At-the high-school private, the students NE SE notice not that they have
a. de réelles chances,
some real chances,
b. *la moindre chance,
the slightest chance,
parce qu' ils n' en ont aucune.
because they NE of-it have none.
'At the private high school, the students don't realize that they have real chances/any chance because they have none.'

3.3 Local Accommodation isn't all-or-nothing

Romoli 2011 argued that the analysis of local accommodation using Bochvar's operator A runs into a separate problem: it predicts that accommodation of the presuppositions of a given constituent X should be all-or-nothing, whereas sometimes some presuppositions of X are accommodated while others are not (see also Fox (2013, fn. 35), Francis (2019, section 2.6.3)). While we think that Romoli's original examples could be handled by a tweak to the A-based theory, we will display new examples that fully vindicate his conclusions. We will then show that this problem receives a natural solution within our operator-free analysis based on Generalized Domain Restrictions.

3.3.1 Romoli's argument and its limitations

Romoli 2011 starts from the example in (47)a, where the boxed constituent gives rise to accommodation of the presupposition of *stop* but not of the presuppositions triggered by *being upset* and by *too*. The more complex example in (47)b shows that the purported (non-accommodated) presuppositions really do project like presuppositions out of an *if*-clause.

(47) Romoli's examples (Romoli 2011)
a. Either $\boxed{\text{John stopped being upset that he left the country too}}$, or John started being upset that he left the country too.
b. If either [$\boxed{\text{John stopped being upset that he left the country too}}$] or [John started being upset that that he left the country too], he will let us know soon.

We believe that Romoli considers insertion of A at the points shown in (48)a, where his objection to A is entirely valid: by locally accommodating the presupposition of *stop*, one would be forced to accommodate the presuppositions of the more embedded triggers as well. But Romoli's objection does not work against the modified analysis in (48)b, where A is applied directly to *stop* rather than to the entire VP. This does require an extended definition of A so it can apply to any constituent whose type 'ends in t', rather than just to propositions. But it is routine to define such an operation.[10] The present dialectics is summarized in (49).

(48) a. If either A [John stopped being upset that he left the country too] or A [John started being upset that that he left the country too], he will let us know soon.
b. If either [John [A stopped] being upset that he left the country too] or [John [A started] being upset that that he left the country too], he will let us know soon.

(49) **Romoli's argument and its limitations**
a. In (47), one derives (i) a presupposition that John left the country and that another salient person did too, but (ii) no presupposition that John used to be upset about this fact.
b. On the assumption that A is 'all or nothing', it is unclear how to give it scope "so that it could cancel only the conflicting presuppositions".
c. This conclusion is valid for the LF in (48)a, but not for the LF in (48)b.
d. The latter requires either (i) that lexical presuppositions can fail to be generated, or (ii) a generalized definition of A.

3.3.2 Vindicating Romoli's conclusion: partial accommodation

We will now seek to vindicate Romoli's conclusion in a different way: sometimes one and the same word gives rise to some but not all of its presuppositions—a phenomenon we will term 'partial accommodation'.

[10] The semantic value **A** of the cross-categorial operator *A* can be defined as in (i).

(i) For any type-theoretic object E whose type 'ends in t' and requires n arguments of types $\tau_1, \dots, \tau_n$ to yield a truth value, $\mathbf{A}\, E = \lambda d_{1\tau\_1} \dots \lambda d_{1\tau\_n}\,.\ 1$ iff $E(d_{1\tau\_1}) \dots (d_{1\tau\_n}) = 1$; 0 otherwise.

We start from Homer's *s'apercevoir*. In the negative sentence in (50)a, the verb triggers the inference that the person referred to is in fact unpopular, and it also triggers the inference that this person is alive. Related facts hold in (50)b, which involves universal projection under *none*.

(50) a. Cette personnalité ne s'aperçoit pas qu'elle est impopulaire.
this public-figure NE SE notice not that she is unpopular
'This public figure doesn't realize that they are unpopular.'
=> this person is alive
=> this person is unpopular

b. Aucune de ces dix personnalités ne s'aperçoit qu'elle est impopulaire.
none of these ten public-figures NE SE notices not that she is unpopular
'None of these ten public figures realize that they are unpopular.'
=> each of these ten public figures is alive
=> each of these ten public figures is unpopular

Crucially, there are also cases in which only one of the two presuppositions is locally accommodated, as seen in (51)-(52).

(51) a. Cette personnalité ne s'aperçoit pas qu'elle est impopulaire, car elle est morte!
this public-figure NE SE notice not that she is unpopular, for she is dead
'This public figure doesn't realize that s/he is unpopular because s/he is dead!'

b. Cette personnalité ne s'aperçoit pas qu'elle est impopulaire, car elle ne l'est pas!
this public-figure NE SE notice not that she is unpopular, for she is dead, for she NE it est not!
'This public figure doesn't realize that s/he is unpopular because s/he isn't!'

(52) a. Aucune de ces dix personnalités ne s'aperçoit qu'elle est impopulaire, car elles sont toutes mortes!
none of these ten public-figures NE SE notices that she is unpopular, for they are all dead
'None of these ten public figures realize that they are unpopular, because they are all dead.'
≠> each of these ten public figures is alive
=> each of these ten public figures is unpopular

b. Aucune de ces dix personnalités ne s'aperçoit qu'elle est impopulaire, car aucune ne l'est!
none of these ten public-figures NE SE notices that she is unpopular, for none NE it is
'None of these ten public figures realize that they are unpopular, because none of them is!'
=> each of these ten public figures is alive
≠> each of these ten public figures is unpopular

It is clear that none of the insertion points for A displayed in (53) (for (52)) will be able to distinguish between the two presuppositions. The heart of the matter is that the verb *notice* simultaneously triggers a presupposition about its subject and about the embedded proposition, as stated in (54) (where we greatly simplified the lexical contribution of *notice*). Any occurrence of A that applies above *notice* will fail to draw the necessary distinction.

(53) a. [no public-figure] λx [t_x [A notices] that x is unpopular]
b. [no public-figure] λx [t_x A [notices that x is unpopular]
c. [no public-figure] λx A[t_x notices that x is unpopular]
d. [no public-figure] A λx [t_x A [notices that x is unpopular]

(54) $[[\text{notice } F]]^{c, s, t, w} = \lambda d_e . \#$ iff doesn't exist at t in w or $[[F]]^{c, s, t, w} \neq 1$; 1 iff $\text{notice}'_{t,w}(\lambda t' \lambda w' [[F]]^{c, s, t', w'})(d) = 1$.

Proponents of A are thus forced to complicate their analysis significantly. First, they might need some syntactic representation of the two presuppositions, for instance by decomposing *notice* into two parts, one that triggers a presupposition about subject existence, the other about the truth of the propositional object. This could be implemented by invoking a voice head *v* (e.g. Kratzer 1996), responsible for the subject existence presupposition, while the lexical verb is responsible for the factive presupposition, with an LF akin to (55)a for the accommodation-free case. Depending on how one defines the cross-categorial meaning of A, this might make it possible to apply A to *v* only, as in (55)b, and to *notice* or to the *VP* only, as in (55)c'.

(55) a. t_x v notice that x is unpopular
b. t_x [A v] [notice that x is unpopular]
c. t_x v [[A notice] that x is unpopular]
c'. t_x v A [notice that x is unpopular]

But this measure won't suffice to handle further cases, such as (56), where the relevant presuppositions pertain to the object of the verb. In addition, the possessive description is not by itself responsible for the presupposition that the denoted individuals exist at the time of evaluation, as this presupposition is clearly absent from the possessive description in (57).

(56) a. None of these ten doctors will heal/cure his patient.
=> each of the ten patients is alive
=> each of the ten patients is or was sick

b. None of these ten doctors will heal/cure his patient because the patients are all dead.
≠> each of the ten patients is alive
=> each of the ten patients is or was sick

c. None of these ten doctors will heal/cure his patient because none of the patients are sick.
=> each of the ten patients is alive
≠> each of the ten patients is or was sick

(57) None of these ten children knows anything about his great-great-grandparents.
≠> each/some of these ten children's great-great-grandparents are alive

Yet another response is possible, however. One might object that in our examples, one of the presuppositions isn't generated to begin with. This might explain away some cases, but not all, at least if one accepts Homer's criterion. The crucial cases in this respect are (58)a and (59)a, where the factive presupposition of *notice* involves an indicative clause under *s'apercevoir*, which does not seem amenable to non-triggering. This can be re-established by modifying our examples minimally by adding NPI *le moindre* as in (58)b and (59)b. The result is less acceptable than the NPI-free versions in (58)a and (59)a, and it is also less acceptable than the NPI-full but factive-free examples in (58)c and (59)c.

(58) a. Cette personnalité ne s'aperçoit pas qu'elle a du soutien, car elle n'en a pas!
this public-figure NE SE notices not that she has some support, for she NE of-it has not
'This public figure doesn't realize that s/he has some support, because s/he doesn't have any!'
=> this public figures is alive
≠> this public figures enjoys some support

b. *Cette personnalité politique ne s'aperçoit pas que ses mémoires aient la moindre
this public-figure political NE SE notices not that her memoirs have the slightest

valeur littéraire, parce qu' ils n' en ont aucune!
value literary, because they NE of-it have none!
Intended: 'This public figure doesn't notice that her memoirs have the slightest literary value, because they have none!'

c. Cette personnalité politique ne pense pas que ses mémoires aient la moindre
this public-figure political NE thinks not that her memoirs have the slightest

valeur littéraire, parce qu' ils n' en ont aucune!
value literary, because they NE of-it have none!

'This public figure doesn’t think that her memoirs have the slightest literary value, because they have none!'

(59) a. Aucune de ces dix personnalités ne s'aperçoit qu'elle a du soutien, car aucune n'en a.
none of these ten public-figures NE SE notices that she has some support, for none NE of-it has.
'None of these ten public figures realize that s/he has some support, because none of them has any!'
=> each of these ten public figures is alive
≠> each of these ten public figures enjoys some support

b. *Aucune	de ces	dix personnalités	ne	s'aperçoit	que ses mémoires	aient la	moindre
none	*of these*	*ten public-figures*	*NE*	*SE notices*	*that her memoirs*	*have the*	*slightest*
valeur	littéraire,	parce que		leurs mémoires n’		en	ont aucune.
value	*literary,*	*because*		*their memoirs NE*		*of-it*	*have none!*

Intended: 'None of these ten public figures notices that their memoirs have the slightest literary value, because they have none!'

c. Aucune	de ces	dix personnalités	ne	pense	que ses mémoires	aient la	moindre
none	*of these*	*ten public-figures*	*NE*	*thinks*	*that her memoirs*	*have the*	*slightest*
valeur	littéraire,	parce que		leurs mémoires n’		en	ont aucune.
value	*literary,*	*because*		*their memoirs NE*		*of-it*	*have none!*

'None of these ten public figures thinks that their memoirs have the slightest literary value, because they have none!'

Since accommodation is probably not effected by an operator in these cases, it is also unsurprising that ellipsis fails to give rise to parallelism requirements, as shown in the French examples in (60).

(60) A:	Dans	mon	pays,	le	roi	ne	s'	aperçoit	pas
	In	*my*	*country,*	*the*	*king*	*NE*	*himself*	*notice*	*not*
qu'	il	est	impopulaire.						
that	*he*	*is*	*unpopular.*						

'In my country, the king doesn't notice that he is unpopular.

a. B:	Dans	le	mien	aussi:	il	est	mort.
	In	*the*	*mine*	*too:*	*he*	*is*	*dead.*

In mine too: he is dead.'
=> the king in A's country is alive
=> the king in A's country is unpopular
≠> the king in B's country is alive
=> the king in B's country is or was unpopular

b. B:	Dans	le	mien	aussi:	notre	roi	est	très	populaire.
	In	*the*	*mine*	*too:*	*our*	*king*	*is*	*very*	*popular.*

In mine too: our king is very popular.'
=> the king in A's country is alive
=> the king in A's country is unpopular
=> the king in B's country is alive
≠> the king in B's country is or was unpopular

We conclude that Romoli's conclusion was right: accommodation isn't all-or-nothing. This dovetails with our ellipsis-based argument against the syntactic reality of A: positing A wont help in these cases; and as we will now see, our alternative account solves the problem.

3.4 An account with Generalized Domain Restriction

We will now show that the two problems discussed earlier – the fact that A isn't syntactically real, and Romoli's problem – can be solved using Generalized Domain Restriction.

3.4.1 Ellipsis

We start by analyzing instances of ellipsis schematized in (61)a, with the representation in (61)b.

(61) a. X not $\underline{P}$P'. Y too <not PP'>
b. X λi not i $\underline{P}$P'. Y λi not i $\underline{P}$P'.

The derivation of the meaning of the λ-abstract proceeds as in (62), making use of the rules in (36)-(37). We note that G plays a non-trivial role only when it is applied to predicative elements. For notational simplicity, we write $\underline{P}P'_{t,w}$ for $[[\underline{P}P']]^{c,\,s[i\rightarrow x],\,t,\,w}$ (which does not depend on the assignment function, nor on the context).

(62) $[[\lambda i \text{ not } i\ \underline{P}P']]^{c,s,t,w} = \lambda x_e.\ {}^{G}[[\text{not } i\ \underline{P}P']]^{c,\,s[i\rightarrow x],\,t,\,w}$
$= \lambda x_e.\ \text{not}'({}^{G}[[i\ \underline{P}P']]^{c,\,s[i\rightarrow x],\,t,\,w})$
$= \lambda x_e.\ \text{not}'({}^{G}[[\underline{P}P']]^{c,\,s[i\rightarrow x],\,t,\,w}(x))$
$= \lambda x_e.\ \text{not}'\ [[\lambda d.\ \#\text{ iff } R_{c,\,s[i\rightarrow x],\,t,\,w}(\underline{P}P'_w, d) = 1 \text{ and } \underline{P}P'_{t,w}(d) = \#;\ 1 \text{ iff } R_{c,\,s[i\rightarrow x],\,t,\,w}(\underline{P}P'_w, d) = 1 \text{ and } \underline{P}P'_{t,w}(d) = 1)](x)]$
$= \lambda x_e.\ \text{not}'\ [\#\text{ iff } R_{c,\,s[i\rightarrow x],\,t,\,w}(\underline{P}P'_{t,w}, x) = 1 \text{ and } \underline{P}P'_{t,w}(x) = \#;\ 1 \text{ iff } R_{c,\,s[i\rightarrow x],\,t,\,w}(\underline{P}P'_{t,w}, x) = 1 \text{ and } \underline{P}P'_{t,w}(x) = 1]$

If we feed this λ-abstract its argument corresponding to *X* in (61), which we write as **X**, we obtain the result in (63).

(63) $[[\lambda i \text{ not } i\ \underline{P}P']]^{c,s,t,w}(\mathbf{X}) = \text{not}'\ [\#\text{ iff } R_{c,s[i\rightarrow x],t,w}(\underline{P}P'_{t,w}, \mathbf{X}) = 1 \text{ and } \underline{P}P'_{t,w}(\mathbf{X}) = \#;\ 1 \text{ iff } R_{c,s[i\rightarrow x],t,w}(\underline{P}P'_{t,w}, \mathbf{X}) = 1 \text{ and } \underline{P}P'_{t,w}(\mathbf{X}) = 1]$

Now the key is that the generalized domain restriction $R_{c,s[i\rightarrow x],t,w}(\underline{P}P'_{t,w}, \mathbf{X})$ depends on **X**, and by parity of reasoning, we would get for the elided sentence a generalized domain restriction $R_{c,s[i\rightarrow x],\,t,\,w}(\underline{P}P'_{t,w}, \mathbf{Y})$ that depends on **Y**, the value of the subject of the elided clause.

Since we take such generalized domain restrictions to be contextually determined, it is natural that the context can be adjusted to ensure that $R_{c,s[i\rightarrow x],t,w}(\underline{P}P'_{t,w}, \mathbf{Y})$ avoids a presupposition failure in the elided clause. This can be achieved if $R_{c,s[i\rightarrow x],t,w}(\underline{P}P'_{t,w}, \mathbf{Y})$ entails (by generalized entailment) the presupposition **P** of the elided predicate *$\underline{P}$P'*.

3.4.2 Partial accommodation

The same method can account for cases of partial accommodation discussed in Section 3.3. Since accommodation is now a pragmatic process in which one adjusts a generalized domain restriction in order to satisfy a presupposition, nothing prevents the adjustment from targeting some presuppositions but not others: those that cannot project without yielding a pragmatic failure will be accommodated; others need not be.

To be concrete, consider again the example of partial accommodation in (50)a, with the (A-free) LF in (64).

(64) not [this public figure] $\lambda x\ t_x$ [notices that x is unpopular]

Writing *VP* for the embedded Verb Phrase (so *VP = notices that x is unpopular*), its restricted meaning will be computed as in (65) relative to a context c, an assignment function s' and a world w (but it should be borne in mind that if the entire sentence is evaluated relative to c, s, w, the relevant values of s' will be of the form s' = s[x→d], for d different public figures).

(65) ${}^{G}[[VP]]^{c,s',t,w} = \lambda d\ .\ \#\text{ iff } R_{c,s',t,w}([[VP]]^{c,s',t,w}, d) = 1 \text{ and } [[VP]]^{c,s',t,w}(d) = \#;\ 1 \text{ iff } R_{c,s',t,w}([[VP]]^{c,s',t,w}, d) = 1 = [[VP]]^{c,s',t,w}(d) = 1$

With a trivial generalized restriction, projection will give rise to a requirement that, at the world and time of evaluation (i.e. at the world and time of the context, if the sentence isn't embedded[11]), the subject public figure is (i) unpopular and (ii) alive.[12] If the 'alive' inference cannot be accommodated globally because this would contradict the rest of the sentence, as in (51)a, one can assume that for d = the subject public figure, $R_{c,s[x\rightarrow d], t, w}([\![VP]\!]^{c, s[x\rightarrow d, t, w}, d)$ guarantees that d is alive in w – and thus the 'alive' presupposition of the VP will be locally satisfied without yielding undesirable inferences about the world of evaluation. On the assumption that the restriction contributed by R is minimal, we will still preserve the inference that the subject public figure is unpopular. In the case of (51)b, things are reversed, and it is now just the presupposition that the subject public figure is unpopular which is accommodated by way of a non-trivial R, whereas the presupposition that the subject public figure is alive will be preserved.

The foregoing discussion pertained to a VP (namely *notices that x is unpopular*) found under a λ-abstractor, and thus the same account will extend to the quantified examples in (52), which can uniformly be given the Logical Form in (66), without the operator A:

(66) [no public-figure] $\lambda x\ t_x$ [notices that x is unpopular]

Theory-neutrally, partial accommodation of the 'alive' presupposition predicts the same behavior as for the sentence in (67)a, while partial accommodation of the 'unpopular' presupposition should be similar to (67)b.

(67) a. [None of these public figures]$_x$ **is alive** and notices that they$_x$ are unpopular.
=> all of these public figures are alive
b. [None of these public figures]$_x$ **is unpopular** and notices that they$_x$ are unpopular.
=> all of these public figures are unpopular

Two remarks should be added for clarity. First, the end of the target sentences in (52)a/b asserts that in (67)a/b the conjunction of the nominal restrictor with the (boldfaced) first conjunct is vacuous. But this does not mean that this conjunction is *presupposed* to be vacuous (which might give rise to deviance), as what is assumed in the global context is of course less specific than what is asserted. Second, several theories of presupposition projection (notably, various incarnations of dynamic semantics following Heim 1983) predict a conditional presupposition, both in (67) and in our analysis of partial accommodation. For instance, partial accommodation of the 'unpopular' presupposition as well as (67)b are predicted to just presuppose that for each of the relevant public figures x, *if x is unpopular, x is alive*. This is too weak, but this is an instance of a far more general issue called the Proviso Problem: in diverse cases, dynamic semantics (and other frameworks) predict conditional presuppositions when unconditional ones are observed (see for instance Geurts 1996, 1999, Lassiter 2012, Mandelkern 2016). This a question that is orthogonal to the issue of accommodation per se, as shown by the fact that it arises in (67) just as it does in our target examples in (52). We thus leave this issue aside in what follows.

4 Presupposition Accommodation Without Operators II: Intermediate Accommodation and Further Refinements

As mentioned above, one might object that the cases we considered result from non-triggering rather than from local accommodation proper. The dialectical situation is somewhat peculiar, as such an objection would save the A operator from our argument, but it would also obviate the need for A in the first place: if non-triggering is a general possibility, why not rely on it to account for *all* cases of local accommodation?

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[11] We assume, as is standard, that if *F is uttered in context c and if s properly represents the referential intentions in c for free variables of F, then F is true in c if and only if* $[\![F\,]\!]^{c\,,\,s\,,\,t\_w,\ c\_w} = 1$, where c_t and c_w (i.e. c_t and c_w) are respectively the time and world coordinates of c.

[12] We distinguish these in our discussion, but we do not have to assume that these are morpho-syntactically distinct at the lexical level: *notice* will come with failure conditions that take into account all presuppositions at once.

While we invoked Homer's intervention criterion to exclude non-triggering as an explanation, it would be reassuring to have an independent argument that non-triggering isn't at stake. We will now develop one using intermediate accommodation, cases in which a presupposition is undoubtedly triggered because it projects to an entire constituent, but is still accommodated in an intermediate context. Since intermediate accommodation is notoriously difficult to obtain empirically, we can only hope to show that, *to the extent that it is possible,* it gives rise to the expected inferential patterns in ellipsis.[13] Having completed our argument in this way, we will refine our theory by discussing a constraint on Generalized Domain Restriction.

4.1 Intermediate accommodation and ellipsis

Schematically, we will consider examples that have the form in (68), where *think-not* corresponds to the verb *doubt/don’t think*, and where the bracketed part is elided.

(68) X think-not if $\underline{p}$p’, q. Y too <think-not if $\underline{p}$p’, q>.

Simplifying somewhat,[14] there are three patterns of accommodation and they can be paraphrased (with conjunctions) as in (69). All possible patterns, yield substantially different readings, which can be teased apart. Critically, intermediate accommodation is entailed by *Y thinks not p* and it is the only reading that is.

(69) **Possible patterns of accommodation in the elided clause**
a. Global accommodation
[p and Y thinks that p] and Y think-not if p’, then q

b. Local accommodation
Y think-not if [p and p'], q

c. Intermediate accommodation
Y think-not [p and if p', q]

Consider (70). We aim for a non-parallel reading where the antecedent clause uttered by person A does not involve any accommodation whereas the elided clause uttered by person B does.

(70) A: I doubt that the Statue of Liberty would collapse if an earthquake shook its pillars.
B: I do too, but that's because I know that the Statue of Liberty doesn't have pillars.

[13] In section 3.3.2, we used Homer’s diagnostic to exclude the possibility that apparent cases of partial accommodation are in fact due to non-triggering of the relevant presupposition. In principle, we could construct a new argument to the same effect using intermediate accommodation. The logic would be that part of the presupposition fully projects (thus excluding the possibility that non-triggering is involved), while another part is accommodated at an intermediate scope. We tried to construct such examples, as in elided part of (i) (here ellipsis is just intended to make the sentence easier to process). The idea was that the factive presupposition of *feel angry* fully projects (hence the purported inference that B's company's interns were underpaid), while that of *continue* is accommodated at an intermediate level (if it fully projected or if gave rise to non-triggering/local accommodation, there would be an inference that B's company's interns used to feel angry). Owing to the difficulty of intermediate accommodation itself, we could not get clear judgments, be it in favor or against our contention. We therefore leave this possibility open for future research.

(i) A: In my company, it's impossible/inconceivable that the interns won't **continue** to **feel angry** that they are underpaid.
B: In mine as well – for here they never did.
Purported judgments (unclear):
=> A's company's interns were underpaid; => A's company's interns have felt angry that they were underpaid
=> B's company's interns were underpaid; ≠> B's company's interns have felt angry that they were underpaid

[14] Once again, we disregard issues related to the Proviso Problem.

B': I too doubt that the Statue of Liberty would collapse if an earthquake shook its pillars, but that's because the Statue of Liberty does not have pillars.

On the operator-based theory, the representation of the elided clause would have to contain A under *think-not*, as represented in (71). And the syntactic parallelism condition would require that it should be present in the antecedent as well, thus predicting intermediate accommodation in the antecedent clause as well.

(71) X think-not A not pp'. Y too <think-not A not pp'>.

Since intermediate accommodation is notoriously difficult, we include a control without ellipsis in (70)B'. If a parallelism makes itself felt on ellipsis, only the unelided control in B' should allow for a non-parallel reading and thus be felicitous (with intermediate accommodation in the elided clause but not in the antecedent clause). For our consultants, both the target elided sentence and the unelided control do, confirming that intermediate accommodation is not subject to parallelism.

In sum, we have developed an independent argument that non-triggering alone couldn't explain the interaction between ellipsis and accommodation. In the cases we just saw, the antecedent sentence involves full projection, and thus the accommodation operator could not be present. Simultaneously, however, an elided clause displays intermediate accommodation. Non-triggering couldn't derive the observed inferential patterns, and the syntactic parallelism on ellipsis excludes the possibility that A is the source of the phenomenon (as it is not present in the antecedent clause).

4.2 Constraining Generalized Domain Restriction

As a final remark, we should note that Generalized Domain Restriction is a powerful mechanism. In principle, there is no bound on how restrictive the value of G can be, and it may apply to both nominal and verbal elements. By itself, this need not be a problem: as with implicit domain restrictions, we assume that G is determined through context and thus constrained by the pragmatics. Still, there seems to be an important difference between verbal and nominal restrictions. In the nominal realm, domain restriction is the norm. In the verbal domain, it seems to be used rather sparingly, possibly just as a last resort to avoid infelicities. We leave this problem for future research and just stipulate in (72) that verbal domain restrictions might be a last resort.

(72) **Conjecture: Verbal Domain Restriction as a Last Resort**
Applications of Generalized Domain Restriction to the verbal domain might be limited to cases in which this helps avoid infelicities (such as presupposition failure).

Stepping back, we have seen arguments from two sources against the syntactic reality of the A operator, and in favor of the operator-free analysis we developed: ellipsis tests suggest that A isn't real; and a generalization of Romoli's data suggests that A couldn't properly handle partial accommodation anyway.

We will now extend the logic of our argument against A to a separate pragmatic operator that has been posited in recent research, Blumberg and Goldstein's non-redundancy operator R.

5 Non-Redundancy Without *R* I: Diversity

Blumberg and Goldstein 2021a,b propose that a large class of inferences are due to a ban against redundancy. This includes diversity inferences and ignorance inferences, which are exemplified in (73).

(73) a. Diversity inferences
The detective hopes/fears that the surveillance cameras are functional. ⇒ the detective doesn't know whether the surveillance cameras are functional.
b. Igonorance inferences
The detective believes Mary or Sue committed the crime.
⇒Jim doesn't know whether Mary or Sue committed the crime.

c. Jim can eat ice-cream or cake.
⇒ Jim can eat ice-cream and Jim can eat cake.

Diversity inferences refer to cases in which embedding of a clause *F* under an attitude verb such as *hope* or *fear* triggers an inference that the attitude holder believes *F* to be possibly true and possibly false, as illustrated in (73)a. Ignorance inferences refer to cases in which a disjunction *A or B* (or sometimes conjunction *A and B*) embedded under an attitude verb triggers the inference that the attitude holder takes the status of *A* and of *B* to be open, as illustrated in (73)b.

Blumberg and Goldstein further observe that these meaning components can sometimes make at-issue contributions in the scope of various quantifiers. To account for such local readings, they posit a covert syntactic operator R, whose existence is thus motivated by analogy with the exhaustivity operator O discussed in Section 1.1.

We will now cast doubt on the syntactic reality of R. We start by showing that the inferences Blumberg and Goldstein consider are not all of the same nature. We propose that diversity conditions are lexically triggered presuppositions and not the by-product of a general non-redundancy mechanism. After excluding diversity inferences from consideration, we will apply the ellipsis test to show that ignorance inferences cannot be syntactic enrichments, as proposed by Blumberg and Goldstein. Finally, we will propose an alternative treatment of these inferences in terms of *pragmatic* non-triviality conditions.

5.1 Diversity inferences and the R-based account

Blumberg and Goldstein observe that a number of attitude verbs, such as *hope*, *fear* and *wonder*, come with diversity conditions: they can only be used if the attitude holder believes the embedded proposition to be possibly true and possibly false, as illustrated in (74).

(74) a. *Context:* The detective believes that Ann didn't commit the crime.
#He hopes that/fears that/wonders whether she did.
b. *Context:* The detective believes that Ann committed the crime.
#He hopes that/fears that/wonders whether she did

In Blumberg and Goldstein's proposal, this diversity requirement arises from a condition against redundant material, reified by way of a syntactic operator R. Simply put, R yields undefinedness if its propositional argument is uniformly true or uniformly false throughout the local context. A formal definition is given in (75)a, where lc is a local context parameter (something we do not make use of in our own treatment). The proposal also relies on the two auxiliary assumptions listed in (75)b.

(75) a. **Semantics of R**
$[\![RA]\!]^{c, s, lc, w} = \#$ unless for some w', w" in lc, $[\![A]\!]^{c, s, lc, w'} \neq [\![A]\!]^{c, s, lc, w''}$; if $\neq \#$, $= 1$ iff $[\![A]\!]^{c, s, lc, w} = 1$.

b. **Auxiliary assumptions**
(i) The attitude verbs in (73)-(74) set the local context of the embedded clause to the doxastic alternatives of the matrix agent.
(ii) The semantics of these attitude verbs is bivalent: failure of the embedded clause yields falsity of the embedding clause.

With the LF in (76)a below, and the auxiliary assumptions, this proposal correctly predicts the diversity inferences for *hope* seen in (74).

(76) a. x hopes Ra
a'. **Predicted truth conditions**
In the best of x's doxastic alternatives, *A* is true, in some of x's doxastic alternatives, *A* is true, while in others, *A* is false

An R-based account also predicts that diversity inferences can be generated in the scope of various quantifiers. Blumberg and Goldstein give the following example to illustrate:

(77) *Context:* There are three detectives and several suspects. All three detectives most desire that Ann committed the crime, since they already have her in custody. One detective is sure that Ann did it, but the others don't know anything yet.
Exactly two detectives hope that Ann committed the crime

As stated, however, the account of diversity inferences suffers from one empirical and one conceptual problem, requiring some refinements. Empirically, the case of *believe* is problematic. *believe* does not trigger a diversity inference, as such an inference would contradict what is asserted by the sentence: in (78)a, the assertion rules out that the detective leaves open whether Mary is the culprit.

(78) a. The detective believes that Mary is the culprit.
$\not\Rightarrow$ The detective does not believe that Mary is the culprit.
b. The detective believes R [Mary is the culprit].

This shows the need to regulate the distribution of R. To rule out (78)b and other distributional requirements, Blumberg and Goldstein 2021a invokes the principles of Contradiction Avoidance and the Strongest Meaning Hypothesis, described below. To avoid generating contradictions, they also assume that Contradiction Avoidance overrides the Strongest Meaning Hypothesis.

(79) **Contradiction Avoidance:** Do not insert R if inserting it makes the sentence contradictory.
Strongest Meaning Hypothesis: When choosing between parses of a sentence that only differ in the distribution of the R operator, pick that parse which yields the strongest meaning.

In the later piece Blumberg and Goldstein 2021b, the distribution of R is left to future research, noting issues with the principles in (79). Our arguments in the sequel will not rely on the specifics of the distribution of R and we may keep these principles as a useful guide in distinguishing parses.

Conceptually, their assumption (in (75)b(ii)) that attitude verbs converts failure of the embedded clause to falsity (of the embedding clause) seems at odds with the fact that attitudes project presuppositions. In fact, they assume that the failure triggered by R, notated as #, is not presupposition failure, but another kind of failure living alongside presupposition failure.

5.2 Diversity conditions as simple presuppositions

Having spelled out Blumberg and Goldstein's basic account, we turn to some challenges. In their proposal, diversity inferences are derived through a uniform mechanism, namely the insertion of the operator R. It derives diversity inferences as part of the assertive content: while the semantics of R is trivalent, the attitude verb makes its contribution at-issue (per the assumptions in (75)b).

However, diversity inferences triggered by different attitude verbs display different pragmatic statuses. On the one hand, the diversity inferences of *wonder* don't project over negation or in questions, as illustrated in (80), and in this respect they behave like ordinary at-issue content. This is as expected on the R-based account.

(80) a. Does Jane wonder whether it's raining?
$\not\Rightarrow$ it's not the case that Jane believes it's raining
b. Jane isn't wondering whether it's raining.
$\not\Rightarrow$ it's not the case that Jane believes it's raining

By contrast, *hope* triggers diversity inferences that do project in these environments, as seen in (81).[15] This is unexpected for Blumberg and Goldstein's account: in their account, all diversity inferences are at-issue hence should fail to project.

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[15] We don't include the other part of the diversity inference: *it's not the case that Jane believes it's not raining*. We believe that this inference may be at-issue for *hope*. For instance, a sentence such as *Jane no longer hopes to win the election* seems (to our ear) acceptable in a context where Jane has just learned that she has lost. Here, no inference is triggered of the form: *not [Jane believes she hasn't won]*. For simplicity, we disregard this point in our discussion of Blumberg and Goldstein's account, but we do take it into account in our lexical entry for *hope*

(81) a. Jane hopes that it's raining.
⇒ it's not the case that Jane believes it's raining
b. Jane doesn't hope that it's raining
⇒ it's not the case that Jane believes it's raining
c. Does Jane hope that it's raining?
⇒ it's not the case that Jane believes it's raining

The heterogeneity of diversity inferences is unexplained if one and the same mechanism, namely the R-operator, underlies them all. We find the following alternative explanation more natural: diversity inferences are part of the lexical semantics of the attitude verb.[16] Specifically, we propose a denotation for *hope*, in (82), which has a diversity inference as a lexical presupposition, while the denotation for *wonder whether*[17], in (83), encodes it as an assertion. Both denotations draw from Heim (1992), who gave a related lexical entry for *want*, reproduced in modified form in (84). (From here on, we don't explicitly consider in our lexical entries cases in which arguments of an item may evaluate to #; we assume that an explanatory theory of presupposition projection explains how undefinedness in the arguments translate to undefinedness in the output.)

(82) A Heim-inspired semantics for *hope*
$[\![\text{hope}]\!]^{c,s,t,w}(p)(x) = \#$ iff $\mathbf{Dox_w(x) \cap \{w': p(w') = 0\} = \emptyset}$;
$[\![\text{hope}]\!]^{c,s,t,w}(p)(x) = 1$ iff $\mathbf{Dox_w(x) \cap \{w': p(w') = 1\} \neq \emptyset}$ and $\text{Best}(\text{Dox}_w(x)) \subseteq \{w': p(w') = 1\}$

(83) A Heim-inspired semantics for *wonder whether*
$[\![\text{wonder whether}]\!]^{c,s,t,w}(p)(x) = 1$ iff $\mathbf{Dox_w(x) \cap \{w': p(w') = 1\} \neq \emptyset}$ and $\mathbf{Dox_w(x) \cap \{w': p(w') = 0\} \neq \emptyset}$
$[\![\text{wonder whether}]\!]^{c,s,t,w}(p)(x) = 0$ otherwise

(84) A Heim-inspired semantics for *want* (modified from Heim 1992 to state the at-issue conditions in terms of Best, as in Blumberg and Goldstein 2021a,b)
$[\![\text{want}]\!]^{c,s,t,w}(p)(x) = \#$ iff $\mathbf{Dox_w(x) \cap \{w': p(w') = 1\} = \emptyset}$, **or** $\mathbf{Dox_w(x) \cap \{w': p(w') = 0\} = \emptyset}$;
$[\![\text{want}]\!]^{c,s,t,w}(p)(x) = 1$ iff $\text{Best}(\text{Dox}_w(x)) \subseteq \{w': p(w') = 1\}$

A harder challenge for this lexicalist account is to explain Blumberg and Goldstein's observation that diversity inferences (be they presuppositional as with *hope* or assertive as with *wonder whether*) may sometimes intrude under quantifiers, as in (85), repeated from (77).

(85) *Context:* There are three detectives and several suspects. All three detectives most desire that Ann committed the crime, since they already have her in custody. One detective is sure that Ann did it, but the others don't know anything yet.
Exactly two detectives hope that Ann committed the crime

Fortunately, there are two reasonable solutions under our lexical account. First, the intrusive reading could be handled as a case of local accommodation of the diversity presupposition of *hope*. Second, local accommodation might not even be necessary if presuppositions are projected in existential form by numerals, as is suggested by the experimental results of Chemla 2009. Under the 'existential projection' view, the lexical entry for *exactly two* might be that in (86). It has a very weak presuppositional requirement, to the effect that at least one of the three detectives takes it to be possible that Ann didn't commit the crime. This existential presupposition is satisfied by the scenario of (85). The at-issue truth conditions end up counting the number of detectives that satisfy the ('possibly false')

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in (82) (where the condition that the attitude holder takes the embedded proposition to be possible is at-issue). In the end, *wonder*, *hope* and *want* all display slightly different behaviors with respect to these diversity inferences: for *wonder*, they are at-issue; for *want*, they are presuppositional; for *hope*, one is presuppositional and one is at-issue. This typology only reinforces our point that lexical idiosyncracies are at work here.
[16] For theories that posit a general algorithm to trigger apparently lexical presuppositions in other cases, these cases would need to be revisited as well.
[17] This is a shortcut: any appropriate semantics for *wonder whether* should derive its meaning compositionally, from a denotation for *wonder* and the meaning of an indirect yes-no question. We won't pursue this point here.

presupposition combined with the at-issue contribution of the verbal predicate, which yields the desired result.

(86) **Existential projection rule for *exactly two***
If **NP** and **VP** are of type <e, t>,
[[Exactly two]] (**NP**)(**VP**) ≠ # only if for at least one object d, **NP**(d) = 1 and **VP**(d) ≠ #;
if ≠ #, [[Exactly two]] (**NP**)(**VP**) **= 1** iff |{d: **NP**(d) = **VP**(d)}| = 2

Owing to the heterogeneous behavior of diversity inferences, we conclude that a lexical account of diversity inferences is empirically more adequate than the R-based analysis. It is also more parsimonious, as it does not rely on the postulation of a new covert operator. This conclusion leaves open the possibility that Blumberg and Goldstein's account might be correct for the other inferences they discuss, in particular ignorance inferences. But in the next sections, we show that the ellipsis test casts doubt on the syntactic reality of R, a result that dovetails with our discussion of the accommodation operator A. We propose instead an entirely pragmatic account of Blumberg and Goldstein's ignorance inferences, based on older Stalnakerian ideas.

6 Non-Redundancy without *R* II: Problems with the R-based Account of Ignorance

Blumberg and Goldstein's ignorance inferences involve cases in which *A or B* as well as *A and B* are embedded under attitude verbs and yield the inference that the attitude holder is ignorant about the status of *A*, *B*. Blumberg and Goldstein propose to treat such inferences as instances of non-redundancy implemented in terms of the R operator discussed in the previous section. The same ellipsis-based tests as in our discussion of the operator A will argue against this syntactic treatment, and in favor of an operator-free alternative.

6.1 Ignorance inferences with R

Blumberg and Goldstein 2021a,b argue that (87) yields the inference that the agent is ignorant about the individual disjuncts.

(87) The detective believes that/hopes that/fears that/wonders whether Ann or Bill committed the crime.
=> the detective thinks it's possible that Ann committed the crime
=> the detective thinks it's possible that Bill committed the crime

Blumberg and Goldstein also show that with all attitudes considered but *believe*, similar ignorance inferences are triggered by conjunctions, as illustrated in (88).

(88) Mary hopes that/fears that/wonders whether Ann brought apple pie and Bill brought blueberry pie.
=> Mary thinks it's possible that Ann didn't bring apple pie
=> Mary thinks it's possible that Bill didn't bring blueberry pie

Blumberg and Goldstein's analysis relies on the insertion of R in appropriate positions. They posit representations such as those in (89)-(90). A key auxiliary hypothesis, which is standard in local context theory, is that in *[A and B]* the local context of *B* is the local context of the entire embedded clause updated with *A*, whereas in *[A or B]* the local context of *B* is the local context of the embedded clause updated with *not A*; this is stated in (90).

(89) a. The detective hopes that Ann or Bill committed the crime.
b. x hopes RA ∨ RB

(90) a. Mary hopes Ann brought apple pie and Bill brought blueberry pie.
b. x hopes RA ∧ RB

(91) Auxiliary assumptions
a. In *[A and B]* the local context of *B* is the local context of the entire constituent updated with *A* (i.e.

intersected with the value of *A*).
b. In *[A or B]* the local context of *B* is the local context of the entire constituent updated with *not A* (i.e. intersected with the value of *not A*).

The structures in (89)b and (90)b deliver the correct ignorance inferences. As mentioned in the previous section, Blumberg and Goldstein take the local context of the embedded clause to be the set of doxastic alternatives of the agent. With the assumptions in (91), these principles and the semantics of R entail that *[R A]* is defined only if *A* is undecided over the set of doxastic alternatives, i.e. the detective deems *A* and its negation to be possible. In (90), *[R B]* will be defined only if *B* is undecided over the set of A-worlds among the agent's doxastic alternatives. Similarly, in (89), *[R B]* will be defined only if *B* is undecided over the set of not-A-worlds among the agent's doxastic alternatives. In particular, we have derived the desired ignorance inferences: disjunction embedded under attitudes will only be felicitous if each disjunct is true in some doxastic alternative, and conjunction embedded under attitudes will only be defined if each conjunct is false in some doxastic alternative.

As Blumberg and Goldstein point out, the structures in (89)b-(90)b in fact yield stronger inferences. In the case of disjunction, it is also required that some doxastic alternatives satisfy neither *A* nor *B*. Otherwise, *A or B* would hold across these alternatives, and thus *B* would be implied by *[not A]*, with the result that *B* would be redundant in its local context. This is simply the diversity inference derived in a different manner. As seen in the previous section, such an inference will be contradictory in the case of *believe*. In other words, the structure in (92)c is not admissible:

(92) a. The detective believes that Ann or Bill committed the crime.
b. x believes RA ∨ B
c. #x believes RA ∨ RB

Blumberg and Goldstein rule out (92)c using Contradiction Avoidance as stated in (79). Fortunately, the structure in (92)b is sufficient to generate the ignorance inference: it implies that the agent does not know whether *A*; and combined with the fact that she believes *A or B*, this implies that she believes *B* is possible[18].

As in the previous section, the syntactic nature of Goldstein and Blumberg's account predicts that ignorance inferences could make a contribution in the scope of quantifiers, a case illustrated in (93) and predicted by the structures in (94).

(93) a. *Context:* There are three detectives, and two possible suspects: Ann and Bill. One detective has already ruled out Ann, but the others haven't ruled out either Ann or Bill.
Exactly two detectives believe that Ann or Bill committed the crime.

b. *Context:* There are three detectives and three possible suspects: Ann, Bill, and Carol. The detectives have Ann and Bill in custody, but can't find Carol. One detective is sure that Ann didn't do it, but the others don't know anything yet.
Exactly two detectives hope that Ann or Bill committed the crime.

c. *Context:* Three of Mary's friends are at a potluck dinner. All three most prefer apple pie and blueberry pie to any other type of pie. One already knows that Ann brought apple pie, but the others don't know anything about who brought what.
Exactly two of Mary's friends hope that Ann brought apple pie and Bill brought blueberry pie.

(94) a. [Exactly two detectives] $\lambda x\ t_x$ believe [RA or B]
b. [Exactly two detectives] $\lambda x\ t_x$ hope [RA or RB]
c. [Exactly two detectives] $\lambda x\ t_x$ hope [RA and RB]

[18] Still, this does not imply that *[not B]* is possible. This account thus falls short of deriving true ignorance inferences. This problem also befalls the account we will later present.

6.2 *Problems*

Despite these positive results, we will now show that the R-based account of these ignorance inferences makes incorrect predictions about ellipsis, and we will offer an operator-free alternative analysis. In Section 5, we argued that the lexical semantics of attitudes verbs is responsible for their diversity inferences. But this account cannot extend to ignorance inferences triggered by embedded conjunctions and disjunctions, as the latter are not directly visible to the lexical semantics of the attitude verbs. We will thus develop a different account based on local pragmatic principles.

6.2.1 Problems with ellipsis: believe

Blumberg and Goldstein's syntactic analysis makes a prediction: in ellipsis, if the elided material is large enough, R should be present in the elided expression as well as in its antecedent, or it should be absent from both, as schematically illustrated in (95), where we once again enclose the elided material within angle brackets.

(95) a. x $V_{attitude}$ [RA or (R)B]. Not y <$V_{attitude}$ RA or (R)B>
b. x $V_{attitude}$ [A or B]. Not y <$V_{attitude}$ A or B>

These predictions appear to be in error. Consider the dialogue in (96). If A's utterance has the structure in (95)a, with R, then B's utterance should contain R as well, and either of the continuations listed would be felicitous, contrary to fact. If A's utterance has the structure in (95)b, this problem does not arise, but another one does: A’s assertion is incorrectly predicted not to trigger ignorance inferences.

(96) Dialogue:
A: The detective believes that Ann or Bill committed the crime.
B: I don't!
(#In fact, I know that Bill did it.)
(#In fact, I know that Ann did it.)

Related problems arise with conjunction. To account for the ignorance inferences triggered by each conjunct, Blumberg and Goldstein must analyze (97)a as (97)a' and (97)b as (97)b': in each case, *R* appears twice in the first embedded clause, which is then copied under negation in the second clause. This predicts readings on which the negation could be true simply because the speaker is certain that Ann will or did bring apple pie. While this might be a possible reading, this does not seem to us to be the only reading. Specifically, the salient reading of (97)a implies that I don't want Ann to bring apple pie and I don't want Bill to bring blueberry pie, but the inference doesn't follow from the R-full representation in (97)a'.

(97) a. Mary wants Ann to bring apple pie and Bill to bring blueberry pie, but I don't.
a'. x wants [RA and RB]. I don't <want [RA and RB]>.
b. Mary hopes that Ann brought apple pie and Bill brought blueberry pie, but I don't.
b'. x hopes [RA and RB]. I don't <hope [RA and RB]>.

6.2.2 Problems with projection: want and hope

Under *want*, the R-based account fails to predict that ignorance inferences in fact project out of various environments. In view of the Strongest Meaning Hypothesis, the negative sentence in (98)a should have the R-free representation in (98)b, without an embedded R. But this fails to derive the diversity inference that is in fact observed. The same remarks extend to the conditional sentence in (98)a.

(98) a. The detective doesn't hope that the award goes to Ann or Bill.
=> the detective thinks it's possible that the award goes to Ann or not, and similarly for Bill
b. not x hope [$A \vee B$]

(99) a. If the detective hopes that the award goes to Ann or Bill, he'll say so.
=> the detective thinks it's possible that the award goes to Ann or not, and similarly for Bill
b. if x hopes [A ∨ B], C

Importantly, the lexical presupposition of *want* in (84) only derives the result that, for the attitude holder, the entire clause *[A ∨B]* is possibly true and possibly false. The latter requirement (*[A ∨B]* is possibly false) entails that for the attitude holder *A* is possible false and *B* is possibly false. But the former requirement (*[A ∨B]* is possibly true) doesn't entail that for the attitude holder A is possibly true.[19]

When it comes to *[A &B]* embedded under *want*, Blumberg and Goldstein predict once again an R-free representation under negation, as in (90)b, but this fails to account for intuitive ignorance inferences illustrated in (100)a. The lexical presupposition in (84) derives part of the result, namely that for the attitude holder *A* is possibly true and *B* is possibly true. But this lexical presupposition does not on its own derive the inference that for the attitude holder *A* is possibly false and *B* is possibly false (e.g. the requirement that the entire conjunction is possibly false could be entirely due to *B*, not to *A*). While one could in principle posit that the conjunction somehow has intermediate scope, yielding a representation equivalent to (100)c, this mere possibility would not explain why the ignorance inference appears to be non-optional.

(100) a. Mary doesn't want Ann to bring apple pie and Bill to bring blueberry pie.
=> Mary thinks it's possible that Ann will or won't bring apple pie, and that Bill will or won't bring blueberry pie
b. not x want [A and B]
c. not [x want A] and not [x want B]

Importantly, this diversity inference couldn't be treated by inserting R despite the Strongest Meaning Hypothesis, for in view of Blumberg and Goldstein's semantics, this would predict that the diversity component is at-issue, and should be affected by the negation, contrary to fact. Whatever inference it is, it seems not to be part of the at-issue contribution of the attitude report.

Further projection problems arise with embedding under existential modals, as in (101)a. In view of the Strongest Meaning Hypothesis, we expect R to appear in embedded position, as in (101)b. But within Blumberg and Goldstein's system (summarized in (73)), failure within the embedded clause translates into falsity (rather than failure) of the immediately embedding clause (in our case: *x want [RA ∨RB]*). As a result, no projection is predicted out of the scope of *maybe*, and the result is arguably too weak, as the predicted inference is that there should be a *possibility* that the detective is ignorant about the embedded disjuncts.

(101) a. Maybe the detective wants Ann or Bill to be indicted.
=> the detective thinks it's possible that Ann will or will not be indicted, and similarly for Bill
b. Maybe x want [RA ∨ RB]

7 Non-Redundancy Without *R* III: an Operator-Free Account of Ignorance

Having laid out the problems with Blumberg and Goldstein's analysis of ignorance inferences, we will now develop an alternative account without R or other syntactic operators.

7.1 General idea

Our account relies on a similar intuition to that guiding Blumberg and Goldstein's account. First, we propose a generalization of Stalnaker's proposal that "a speaker should not assert what he presupposes

[19] Note that we do not discuss *hope* in this connection because the lexical entry in (82) only has a 'possibly false' presupposition, and for embedded *[A ∨B]*, this entails that the agent must take *A* to be possibly false and *B* to be possibly false.

to be true, or what he presupposes to be false" (Stalnaker 1978). This non-triviality condition can be generalized to local contexts, assuming a dynamic view of meaning. This leads to the condition in (102).

(102) **Stalnaker's non-triviality condition**
If relative to a context set C an expression *F* (of a type that 'ends in t') has a local context c', then conditions a. and b. should both be satisfied:
a. c' $\not\models$ F
b. c' $\not\models$ not F

In several cases, however, the condition in (102) is too weak, for two reasons. First, it is a constraint on the common ground and not on the speaker's beliefs: since the common ground is larger than the speaker's belief set, the constraint is more easily and sometimes too easily satisfied. Second, the local context of an embedded expression, for instance the local context of the disjunction in *x believes [A or B]*, will end up encoding uncertainty about the beliefs that the speech act participants attribute to x. Because the form of (102) is that the local context c' should be 'large enough' that certain entailments shouldn't hold, and because c' will in general be fairly weak, the condition will sometimes be too easy to satisfy.

We propose that in certain circumstances (whose precise nature we will leave open), the conditions in (102) may be strengthened. Our starting point is that the inferences are formally anti-presuppositions: they require that local contexts should *fail* to entail certain things. Following the spirit but not the details of Chemla 2008, we will assume that under some conditions these anti-presuppositions can be strengthened, as in the examples reviewed in (21)-(23). For the embedded disjunct *A* in *x believes [A or B],* the unstrengthened conditions will look like (103)a, with the form: *not [∀w: Cw][∀w': …] …* . The strengthened conditions, by contrast, will take the form *[∀w: Cw] not [∀w': …]* … , as in (103)b (we will shortly discuss the assumptions needed to obtain this strengthening).

(103) **Non-triviality condition for *A* in *x believes [A or B]* relative to a global context set C**
a. Unstrengthened non-triviality condition
not [∀w: Cw][∀w': Dox_x(w)] **A**(w') = 1
not [∀w: Cw][∀w': Dox_x(w)] **A**(w') = 0

b. Strengthened non-triviality condition
[∀w: Cw] $\boxed{\text{not } [\forall w'{:}\ Dox_x(w)]\ \mathbf{A}(w') = 1}$
[∀w: Cw] $\boxed{\text{not } [\forall w'{:}\ Dox_x(w)]\ \mathbf{A}(w') = 0}$

To obtain the intrusion of ignorance inferences observed by Blumberg and Goldstein, another pragmatic effect might need to come into play. Consider a negative sentence such as *not x believes [A or B]*. It will give risethe same anti-presupposition as in (103)a, and we can assume that in some cases these will also be strengthened to (103)b, where C is now the local context of the clause embedded under *not*, namely *x believes [A or B]*. The boxed parts of (103)b are in effect presuppositions – in this case relative to the local context C. While this local context is identical to the global context, because it is that of a constituent appearing under negation, it could in principle give rise to local accommodation. This could explain the intrusion of ignorance conditions in truth conditions, as noted by Blumberg and Goldstein for more complex examples such as (93). Importantly, since local accommodation is not realized by way of an operator (as we argued in Sections 3 and 4), we don't expect this intrusion to give rise to parallelism effects in ellipsis.

(104) [Exactly two detectives] $\lambda x\ t_x$ believe [A or B]

Alternatively, one might do everything without appeal to local accommodation, as we argued in discussion of the lexical entry for *exactly two* in (86). On that alternative as well, no operator will be needed[20].

[20]This alternative theory is more difficult to implement within the analysis of local contexts we adopt because the latter does not predict the existential projection needed for the proposed lexical entry of *exactly two*. In the sequel, we focus on the first option, based on the accommodation of the presuppositions in (103)b.

7.2 *x believes [A or B]*

7.2.1 Local context computation

We will start with the schematic example in (105). The first order of business is to compute the local context **c'** of the embedded clause, which we write as a superscript on the embedded clause (as before, we write **c'** for the value of the expression *c'*).

(105) x believes $^{c'}$[A or B]

We will follow the details of the account in Schlenker 2009. To ensure that the value of *c'* is a proposition that can vary with the world of utterance (as the attitude holder might hold different beliefs in different worlds), Schlenker 2009 assumes a bidimensional (Kaplanian) framework with two world-like parameters, one, w*, corresponding to the context, and the other, w, corresponding to the world of evaluation. If $Dox_{\mathbf{x}}(w^*)$ is the set of x's doxastic alternatives in w*, the local context of the embedded clause is given in (106). It is a function from contexts w* to propositions of the form λw $\underline{w^* \in C}$ and $\boxed{w \in Dox_{\mathbf{x}}(w^*)}$. The underlined condition guarantees that the proposition will be non-empty only if w* is indeed in the global context set. The boxed condition states that when this is the case, **c'**(w*) is just the set of x's doxastic alternatives in w*.

(106) $\mathbf{c'} = \lambda w^* \lambda w\ [w^* \in C \text{ and } w \in Dox_{\mathbf{x}}(w^*)]$

7.2.2 Stalnakerian non-redundancy conditions

With this result, we can already state a Stalnakerian non-triviality condition on *A*. We'll write **A**(w*)(w) the value of A evaluated relative to context w* and world of evaluation w. Stalnaker's non-triviality conditions appear in (107), and can be rewritten as in (108).

(107) a. $\mathbf{c'} \not\models A$
b. $\mathbf{c'} \not\models \text{not } A$

(108) a. not $\forall w^*\ \forall w\ [w^* \in C \text{ and } w \in Dox_{\mathbf{x}}(w^*) \Rightarrow \mathbf{A}(w^*)(w) = 1]$,
i.e. not $[\forall w^*:\ w^* \in C]\ [\forall w: w \in Dox_{\mathbf{x}}(w^*)]\ \mathbf{A}(w^*)(w) = 1$

b. not $\forall w^*\ \forall w\ [w^* \in C \text{ and } w \in Dox_{\mathbf{x}}(w^*) \Rightarrow \mathbf{A}(w^*)(w) = 0]$,
i.e. not $[\forall w^*:\ w^* \in C]\ [\forall w: w \in Dox_{\mathbf{x}}(w^*)]\ \mathbf{A}(w^*)(w) = 0$

Following the theories of Beaver 2001 and Schlenker 2009, the local context **c"** of the second embedded disjunct is obtained by intersecting the local context of the entire disjunction with the negation of the first disjunct. This gives the value in (109), and the non-triviality conditions in (110).

(109) $\mathbf{c''} = \lambda w^* \lambda w\ [w^* \in C \text{ and } w \in Dox_{\mathbf{x}}(w^*) \text{ and } \mathbf{A}(w^*)(w) = 0]$

(110) a. not $[\forall w^*:\ w^* \in C]\ [\forall w: w \in Dox_{\mathbf{x}}(w^*) \text{ and } \mathbf{A}(w^*)(w) = 0]\ \mathbf{B}(w^*)(w) = 1$
b. not $[\forall w^*:\ w^* \in C]\ [\forall w: w \in Dox_{\mathbf{x}}(w^*) \text{ and } \mathbf{A}(w^*)(w) = 0]\ \mathbf{B}(w^*)(w) = 0$

The non-triviality conditions are rather weak. This avoids a problem that arose for Blumberg and Goldstein. As we saw, representations like *x believes RA or RB* were contradictory, since *B* was entailed by *not A* in x's doxastic alternatives given the assertion. This structure thus had to be ruled out independently. While very similar to non-redundancy conditions, our non-triviality conditions are stated with respect to the common ground. They can be satisfied even when the speaker believes that *B* is entailed by *not A* in x's doxastic alternatives, as long as the common ground, a larger set than the speaker's belief set, contains a world in which this isn't the case. To put it differently, the contradiction problem does not arise as long as it is not *presupposed* that *x believes A or B*.

Another advantage afforded by the weakness of the non-triviality conditions is that it accounts for the deviance of sentences such as (111)a. Within Blumberg and Goldstein's framework, the candidate structures in (111)a',a" are ruled out by Contradiction Avoidance. Thus the only option for such a sentence is the R-free representation in (111)a, but no deviance is predicted for it .By contrast, we predict that our non-triviality conditions are violated in (111)a, since any common ground fails to satisfy (110)b when A = B.

(111) a. #x believes [A or A]
a'. x believes [RA or A]
a". x believes [RA or RA]
b. #My mother believes that I am at home or at home.

7.2.3 Strengthening

Our non-triviality conditions are the first step towards the desired ignorance inferences. The next step consists in a strengthening of these non-triviality conditions. Without deriving it from first principles (unlike Chemla 2008), we model it as a form of homogeneity with respect to propositions. Our notion of homogeneity is defined in (112).

(112) **Homogeneity with respect to a proposition**

A context set C is homogeneous with respect to a proposition p just in case:

$[\forall w^*\!: w^* \in C]\ p(w^*) = 1$ if and only if $[\exists w^*\!: w^* \in C]\ p(w^*) = 1$
$[\forall w^*\!: w^* \in C]\ p(w^*) = 0$ if and only if $[\exists w^*\!: w^* \in C]\ p(w^*) = 0$
(…from which it follows that
$[\forall w^*\!: w^* \in C]\ p(w^*) = \#$ if and only if $[\exists w^*\!: w^* \in C]\ p(w^*) = \#$)

Note: Since the equivalences have the form
$[\forall w^*\!: w^* \in C]$ F if and only if $[\exists w^*\!: w^* \in C]$ F,
we also have
not $[\forall w^*\!: w^* \in C]$ F iff not $[\exists w^*\!: w^* \in C]$ F, and
$[\exists w^*\!: w^* \in C]$ not F iff $[\exists w^*\!: w^* \in C]$ not F
and thus in particular
$[\exists w^*\!: w^* \in C]\ p(w^*) \neq 1$ if and only if $[\forall w^*\!: w^* \in C]\ p(w^*) \neq 1$
$[\exists w^*\!: w^* \in C]\ p(w^*) \neq 0$ if and only if $[\forall w^*\!: w^* \in C]\ p(w^*) \neq 0$

Applied to the anti-presupposition of Chemla's example in (21), Homogeneity yields the desired strengthening, as can be seen in (113).

(113) a. John believes that I have a sister.
Notation: we write as **sister** the proposition that the speaker has a sister.
b. Result of Maximize Presupposition
not $[\forall w^*\!: w^* \in C]\ \mathbf{sister}(w^*) = 1$, hence
$[\exists w^*\!: w^* \in C]\ \mathbf{sister}(w^*) \neq 1$
b. Homogeneity applied to **sister**
$[\forall w^*\!: w^* \in C]\ \mathbf{sister}(w^*) \neq 1$
c. Result: It is common belief that the speaker does not have a sister.

In the case of interest, *x believes [A or B]*, there are four anti-presuppositions to be considered, listed in (114). Each could in principle be strengthened using homogeneity, with the results in (115).

(114) Stalnakerian non-triviality conditions for *x believes [A or B]*
a. not $[\forall w^*\!: w^* \in C]\ [\forall w\!: w \in Dox_{\mathbf{x}}(w^*)]\ \mathbf{A}(w^*)(w) = 1$
b. not $[\forall w^*\!: w^* \in C]\ [\forall w\!: w \in Dox_{\mathbf{x}}(w^*)]\ \mathbf{A}(w^*)(w) = 0$
a'. not $[\forall w^*\!: w^* \in C]\ [\forall w\!: w \in Dox_{\mathbf{x}}(w^*) \text{ and } \mathbf{A}(w^*)(w) = 0]\ \mathbf{B}(w^*)(w) = 1$
b'. not $[\forall w^*\!: w^* \in C]\ [\forall w\!: w \in Dox_{\mathbf{x}}(w^*) \text{ and } \mathbf{A}(w^*)(w) = 0]\ \mathbf{B}(w^*)(w) = 0$

(115) Candidate strengthenings for (114), using Homogeneity
a. $[\forall w^*: w^* \in C]$ not $[\forall w: w \in Dox_x(w^*)]$ $\mathbf{A}(w^*)(w) = 1$
b. $[\forall w^*: w^* \in C]$ not $[\forall w: w \in Dox_x(w^*)]$ $\mathbf{A}(w^*)(w) = 0$
a'. $[\forall w^*: w^* \in C]$ not $[\forall w: w \in Dox_x(w^*)$ and $\mathbf{A}(w^*)(w) = 0]$ $\mathbf{B}(w^*)(w) = 1$
b'. $[\forall w^*: w^* \in C]$ not $[\forall w: w \in Dox_x(w^*)$ and $\mathbf{A}(w^*)(w) = 0]$ $\mathbf{B}(w^*)(w) = 0$

The conditions in (115)a,b amount to an ignorance inference about **A**. Since the speaker's belief set is a subset of the context set C, these conditions entail Blumberg and Goldstein's non-redundancy conditions. As is the case in Blumberg and Goldstein's analysis, the strengthened inferences in (115)a',b' would contradict the speaker's statement. Like Blumberg and Goldstein, we can prevent this strengthening by invoking Contradiction Avoidance. Importantly, Contradiction Avoidance only prevents *strengthening* of the non-triviality conditions; the non-triviality conditions themselves arise regardless. This means that the infelicity of *x believes [A or A]* discussed in the previous section is still predicted, as it originates in a violation of the *unstrengthened* non-triviality conditions.

7.2.4 Accommodation

Blumberg and Goldstein's conditions are at-issue. For unembedded clauses, applying global accommodation to the strengthened inferences (formally, presuppositions) yields the same result. If we wish to explain the embeddability of the ignorance inferences they observe in (116)a, we can simply apply local accommodation. The account parallels that of the intrusive diversity inference of *hope,* discussed in Section 5.2. Local accommodation can be implemented operator-free, as we did in Sections 3 and 4. Alternatively, one may be able to do everything without local accommodation by using the projection rules for *exactly two* proposed in (86).

(116) a. Exactly two detectives believe that Ann or Bill committed the crime.
b. [Exactly two detectives] λx t_x believe [A or B]

7.3 x hopes [A or B], x hopes [A and B]

The same analysis can be applied to *hope*, with some tweaks.

7.3.1 Local context and Stalnakerian non-redundancy conditions

In our analysis of *believe [A or B]*, we relied on the theory of local contexts proposed in Schlenker 2009 to derive the local context of each disjunct. But Schlenker 2009 does not extend this result to other attitude verbs than *believe* like *hope*. Blumberg and Goldstein postulates that the local context for such verbs would be the same as with *believe*, namely (117).

(117) $\mathbf{c'} = \lambda w^* \lambda w\ [w^* \in C$ and $w \in Dox_x(w^*)]$

This is a reasonable assumption from the perspective of presupposition projection: attitudes like *hope* presuppose that the agent believes the presupposition of the embedded clause.[21] We adopt this assumption without deriving it (but see Blumberg and Goldstein, to appear).

[21] We leave aside the notorious fact that a factive presupposition is often obtained on top of the doxastic presupposition, as seen in the second inference in (i)a. One can view this as an instance of the Proviso Problem, whereby unsupported presuppositions give rise to stronger accommodation than is predicted by current theories of local contexts, including Heim 1983 and Schlenker 2009 (see for instance Geurts 1996, 1999, Lassiter 2012, Mandelkern 2016). One argument for this analysis is that when the doxastic presupposition is explicitly justified, as in(i)b, the factive presupposition disappears. For instance, the following examples seem (to our ear) to yield the following inferences:

(i) a. <> Does your mother hope that you'll continue to be the most attractive person on earth?
=> your mother thinks you currently are the most attractive person on earth
=>? you currently are the most attractive person on earth

(118) a. x hopes [A or B]
b. The detective hopes Ann or Bill committed the crime.

With this assumption, the embedded local contexts are the same in (118)a as in the case of *believe*, and we derive the same non-triviality conditions as with *believe*, stated in (114).

7.3.2 Strengthening and local accommodation

By contrast with *believe*, with *hope* all non-triviality conditions may be strengthened by homogeneity reasoning without contradicting what is asserted. This yields the inferences listed in (119). This result directly mirrors Blumberg and Goldstein's observation that with any attitude other than *believe*, the insertion of *R* on each disjunct of embedded disjunction is not contradictory.

(119) Candidate strengthenings for (114) using Homogeneity
a. $[\forall w^*: w^* \in C]$ not $[\forall w: w \in Dox_x(w^*)]$ $\mathbf{A}(w^*)(w) = 1$
b. $[\forall w^*: w^* \in C]$ not $[\forall w: w \in Dox_x(w^*)]$ $\mathbf{A}(w^*)(w) = 0$
a'. $[\forall w^*: w^* \in C]$ not $[\forall w: w \in Dox_x(w^*)$ and $\mathbf{A}(w^*)(w) = 0]$ $\mathbf{B}(w^*)(w) = 1$
b'. $[\forall w^*: w^* \in C]$ not $[\forall w: w \in Dox_x(w^*)$ and $\mathbf{A}(w^*)(w) = 0]$ $\mathbf{B}(w^*)(w) = 0$

Taken together, the strengthened inferences imply two things: first, that the agent is ignorant about *A* ((119)a and b together), second, that she is ignorant about *B* ((119)a' and b' together). These are the desired ignorance inferences.[22] Just as with *believe,* intrusion of ignorance inferences may be predicted in various ways: either by local accommodation or by projection out of *exactly two*.[23]

8 Conclusion

We conclude that two covert operators posited in recent pragmatic research, the accommodation operator A and the non-redundancy operator R, are not syntactically real. Their effects are better analyzed by way of operator-free pragmatic processes.

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b. <>Your mother is certain that you are the most attractive person on earth, but does she hope you'll continue to be into old age?
≠> your mother thinks you currently are the most attractive person on earth
≠> you currently are the most attractive person on earth

[22] We also derive diversity inferences relative to the entire embedded clause, stated in (i). But these are redundant with the diversity inferences that are triggered lexically by *hope* in the account we developed in Section 5.2.

(i) a. $[\forall w^*: w^* \in C]$ not $[\forall w: w \in Dox_x(w^*)]$ ($\mathbf{A}(w^*)(w) = 1$ or $\mathbf{B}(w^*)(w) = 1$)
b. $[\forall w^*: w^* \in C]$ not $[\forall w: w \in Dox_x(w^*)]$ ($\mathbf{A}(w^*)(w) = 0$ and $\mathbf{B}(w^*)(w) = 0$)

In greater detail: from (119)b', it follows that for every w* in C, $[\exists w: w \in Dox_x(w^*)$ and $\mathbf{A}(w^*)(w) = 0]$ $\mathbf{B}(w^*)(w) \neq 0$, which establishes both (i)a and (i)b.

[23] More generally, our analysis predicts that other anti-presuppositions could intrude under quantifiers. We are unclear about the data. The anti-presupposition of *believe p* (e.g. *p* is false) appears *prima facie* embeddable, as in (i):

(i) Exactly two of our applicants believe they will get the job. The third one knows it.

(i) is judged to be felicitous by our consultants. But this 'anti-presupposition' of *believe* can plausibly be reanalyzed as a regular implicature, by competition with a bivalent (i.e. non-presuppositional) version of *know*. If so, (i) may only support the embeddability of implicatures, not necessarily of anti-presuppositions. More work is needed on this topic.

For accommodation, we suggested that domain restriction could be generalized from the nominal to the verbal domain. In ellipsis, differences seen in terms of local accommodation between an elided expression and its overt antecedent mirror those that are independently found with nominal domain restrictions. Whether one does things in a purely semantic fashion (as we did) or by way of domain restriction variables taking various additional variables as arguments, the data can be handled in a highly explicit fashion. Our account has the advantage of solving an independent problem noted by Romoli: contrary to what A-based theories predict, accommodation isn't all-or-nothing.

For non-redundancy, we argued that the main data motivating R should be analyzed by way of two independently motivated mechanisms. Diversity inferences in the immediate scope of some attitude verbs are due to their lexical presuppositions, as already posited by Heim 1982. Ignorance inferences triggered by embedded disjunctions and conjunctions have a different source: they arise from Stalnekarian conditions that prohibit an expression from being trivial relative to its local context. These inferences are technically anti-presuppositions, but like the latter more generally, they can sometimes be strengthened into presuppositions. And these can sometimes enter in at-issue truth conditions, whether by way of accommodation (implemented operator-free) or because of the lexical semantics of numeral quantifiers.

We leave several important questions for future research. First, as we noted in (72), Generalized Domain Restriction seems to be used more sparingly in the verbal than in the nominal domain; why this is so has yet to be explained.

Second, our account of ignorance inferences triggered by conjunctions and disjunctions crucially relies on mechanisms to strengthen anti-presuppositions into presuppositions. We have argued that there is independent evidence for the existence of such strengthening mechanisms, but we have not sought to derive the precise form of the strengthening rules from first principles; this has yet to be done.

Third, Blumberg and Goldstein motivated their account on the basis of yet another set of data, pertaining to Free Choice readings. The short of it is that the ellipsis test can serve to refute their account, but this can be done using observations that are already in the literature. Because there is such a large literature on Free Choice readings, we leave this issue for future research, but we summarize in Appendix II extant and new objections against an account based on R.

Last, but not least, one will need to ask in the future whether a version of the present arguments extend to the (invisible) elephant in the room, namely the exhaustivity operator O.

Appendix I.
Adding material in the elided expression?

Parallelism conditions on ellipsis allowed us to construct arguments against operator-based views of accommodation and non-redundancy. Whether the conditions are semantic or pragmatic in nature, they rule out structures with the schematic form in (120).

(120) X […]. Y [… Op …]

Still, one may counter that ellipsis does not require strict semantic identity: it may be that ellipsis allows the antecedent and the elided clause to contain different pieces of meaning, so long as sufficiently many pieces are similar.

The first case that comes in mind is that of the apparent deletion of features (and possibly further elements) in the course of ellipsis resolution. An example is given in (121)a. If John identifies as male and Mary identifies as female, (121)a has a bound reading but (121)b doesn't. Descriptively, the masculine feature of *himself* can be disregarded by ellipsis resolution, although the noun *man* cannot be; one theory among others is that features can be deleted under identity with that of a binder[24] (e.g. von Stechow 2003; see also Jacobson 2012, Sauerland 2013, Esipova 2019).

(121) a. John admires ~~him~~self, but Mary doesn't.
b. John admires the man he has become, but Mary doesn't.

But the ability of disregarded part of the antecedent won't help in (120), where material has been *added* to the elided clause.

More relevant is the case of sprouting, illustrated in (122). It argues for a looser formulation of identity conditions because the elided clause contains the trace of an adjunct that lacks a correlate in the antecedent clause.

(122) a. [He painted the wall] but I don’t know in what color [he painted the wall <t>].
b. [She left] but I don't know when [she left <at t>].

For present purposes, the question is whether such looser parallelism conditions would make the elided clause sufficiently parallel to its antecedent despite the difference with respect to the presence of *Op*. This would fundamentally undermine our argument. To put in a slogan, are our target cases instances of "covert operator sprouting"?

There are several disanalogies that make the objection weak, however. First, none of the cases considered involved sluicing or questions. We are not aware of cases of sprouting outside of such environments. Second, the looser parallelism conditions proposed to deal with sprouting don't seem liberal enough to license our cases either. We illustrate with Kotek and Barros's (2019) proposal. For them, ellipsis is licensed when the union of (the members of) the focus value of the antecedent is identical to the union of (the members of) the focus value of the consequent. For (122)b, the union of the focus of the antecedent appears in (123)a and that of the consequent appears in (123)b. Under the assumption that everyone that leaves does so at some point or other, they are indeed identical.

(123) a. $\bigcup [[\text{she left}]]^f = \bigcup \{\lambda w.\ \text{she left in } w\} = \lambda w.\ \text{she left in } w$
b. $\bigcup [[\text{she left } [\text{at } t]_F\ ]]^f = \bigcup \{\lambda w.\ \text{she left at } t' \text{ in } w \mid t' \text{ a moment}\} = \lambda w.\ \text{she left at some point in } w$

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[24] Alternatively, it could be that ellipsis allows *himself* in the antecedent (121)a to count as parallel to *herself* in the ellipsis site. The two words only differ in their presuppositions, and identity of assertive content might be sufficient for the parallelism conditions to be satisfied. Even if this view is correct, our main claim about accommodation and non-redundancy is unaffected because our target sentences should, under the operator theory, have different assertive contents.

This type of parallelism does not hold in our cases. Take, as an illustration, (124) (repeated from (40)). Under a syntactic analysis, we assume the structure in (125).

(124) At my public school, the students don't realize that they have real chances of success.
At my private school as well – but that's because the students are so bad that they don't have/stand a chance.

(125) At my private school, <the students don't Op realize that …>.

The focus values are schematically given in (126): we write *chance(s)* for the proposition "*the students at school s have real chances of success*" and *realize(s)* for the proposition *"the students at s believe that they have chances at s*" (or whatever the assertion corresponding to *realize* is). Because of the presupposition in the antecedent clause, it's unclear what the union of (126)b ought to be: must the presuppositions of all propositions in the set be satisfied (= (126)d)? Or is it sufficient that one of them is (= (126)c)? Whichever choice is made, the resulting proposition is not equivalent to its elided counterpart, due to the semantic contribution of the A operator; as per Kotek and Barros' parallelism conditions, ellipsis should not be licensed.

(126) a. $\bigcup$ [[[at my private school]$_F$, ...]]^f
$= \bigcup\{\lambda w.\ \neg\mathbf{A}([[\text{realize that ...}]]^w(s)) \mid \text{school}_w(s)\}$
$= \bigcup\{\lambda w.\ \neg[\text{chance}_w(s) \wedge \text{realize}_w(s)] \mid \text{school}_w(s)\}$
$= \lambda w.\ [\exists s\text{: school}_w(s)]\ \neg\ [\text{chance}_w(s) \wedge \text{realize}_w(s)]$

b. $\bigcup$ [[[at my public school]$_F$, ...]]^f
$= \bigcup\{\lambda w.\ \neg\ ([[\text{realize that ...}]]^w(s)) \mid \text{school}_w(s)\}$
$= \bigcup\{\lambda w\text{: chance}_w(s).\ \neg\ \text{realize}_w(s) \mid \text{school}_w(s)\}$

c. $=\ ?\ \lambda w$: $[\exists s\text{: school}_w(s)]\ \text{chance}_w(s)\ .\ [\exists s\text{: school}_w(s)]\ \text{chance}_w(s)$ and not $\text{realize}_w(s))$
d. $=\ ?\ \lambda w.\ ([\forall s\text{:school}_w(s)]\ \text{chance}_w(s))\ .\ ([\exists s\text{: school}_w(s)]\ \text{chance}_w(s)$ and not $\text{realize}_w(s))$

In conclusion, the looser parallelism conditions needed for sprouting don't seem to threaten our argument. More generally, we don't know of any independently motivated parallelism conditions loose enough to explain between a clause with an accommodation/non-redundancy operator and one without.

Appendix II.
Free Choice Without R

In this appendix, we briefly discuss Blumberg and Goldstein's account of some Free Choice effects using their operator R. Without giving a full account, we argue (i) that the R-based account is in error, and (ii) that its positive features can be retained, operator-free, on the basis of Stalnakerian conditions of non-triviality. (We emphatically do not seek to develop a full account of Free Choice inferences, a topic that goes beyond the present piece.)

❑ *Blumberg and Goldstein's data and analysis*

Blumberg and Goldstein 2021b apply their framework to Free Choice inferences, illustrated in (127)a, with the representation in (127)b.

(127) a. Mary may have apples or bananas.
=> Mary may have apples
=> Mary may have bananas
b. may [RA ∨ RB]

The local context c' of the embedded clause is the set of deontically accessible possible worlds, and *RA* guarantees that <u>some worlds in c' satisfy A</u> and others don't. The local context of the second disjunct is c' ∩ **(not A)**, and this further guarantees that within c' <u>some</u> (non-A) <u>worlds satisfy B</u> and others don't. The underlined components account for the free choice inference.

Blumberg and Goldstein further propose that the insertion of R under universal modals such as *is required* or *must* is responsible for a diversity inference, as illustrated in (128)a.

(128) a. Mary is required to read Ulysses or Madame Bovary.
=> Mary may read Ulysses and Mary may read Madame Bovary
b. must [RA ∨ B]
c. #must [RA ∨ RB]

The diversity inference can be derived by way of the representation in (128)b, where once again the local context c' of the embedded clause is the set of deontically accessible worlds, while the local context of the second disjunct is c' ∩ **(not A)**. Due to the universal nature of the modal, the representation in (128)c is inconsistent, as it places contradictory demands on the set of deontically accessible worlds: all should satisfy A or B, but in addition some not-A worlds should satisfy not-B (to fulfill the non-triviality requirement of B relative to its local context). No such problem arises with the representation in (128)b.

❑ *Problems with ellipsis*

As was the case for attitude verbs, Blumberg and Goldstein endow modals with a bivalent semantics, with the result that non-redundancy conditions within their scope end up affecting at-issue truth conditions. In elided clauses, one may have no choice but to copy an R-full antecedent. This situation arises in (129)a, which should have the representation in (129)b. The latter predicts that the elided clause negates a clause enriched with non-redundancy conditions. By negating this strong meaning, the overall result is too weak: it fails to license the inference that Bill can't have apples and Bill can't have bananas.

(129) a. Mary can have apples or bananas. Bill can't.
=> Mary may have apples and Mary may have bananas
=> Bill can't have apples and Bill can't have bananas
b. may M λx [RAx ∨ RBx]. not may B λx [RAx ∨ RBx]

In fact, the role of ellipsis in constraining theories of Free Choice was discussed in Bar-Lev and Fox 2017. Starting from an account of Free Choice in terms of double exhaustification (Fox 2007), they noticed that the ellipsis facts in (130)a can be captured if the ellipsis site is small enough, as in (130)b.

(We follow Bar-Lev and Fox in notating the exhaustivity operator as *Exh* rather than as *O*, as was the case at the beginning of this piece.)

(130) a. Mary is allowed to eat ice cream or cake, and John isn't <allowed to eat ice cream or cake>.
=> Mary is allowed to eat ice cream and allowed to eat cake, and
=> John isn't allowed to eat ice cream and he isn't allowed to eat cake.
(Bar-Lev and Fox 2017, handout)

b. Exh Exh Mary λx allowed [Ax ∨ Bx]. John isn't <λx allowed [Ax ∨ Bx]>.

But Bar-Lev and Fox also noticed that the quantified case in (131)a requires double exhaustification under the universal quantifier, yielding the expectation that a Free Choice reading should be obtained under the scope of the negative quantifier with ellipsis, as in (131)b.

(131) a. Every girl is allowed to eat ice cream or cake on her birthday. Interestingly, no boy is allowed to eat ice cream or cake on his birthday.
=> every girl is allowed to eat ice cream and allowed to eat cake on her birthday, and
=> no boy is allowed to eat ice cream and (likewise) no boy is allowed to eat cake on his birthday.
b. [every girl] λx Exh Exh allowed [Ax ∨ Bx]. [no boy] λx Exh Exh allowed [Ax ∨ Bx].
c. Exh^{II} [every girl] λx allowed [Ax ∨ Bx]. [no boy] λx allowed [Ax ∨ Bx].

But the representation in (131)b predicts an overly weak reading, one that doesn't derive the observed inferences. Bar-Lev and Fox took this to be one piece of evidence for replacing the standard exhaustivity operator (based on 'innocent exclusion') with a new one, based on 'innocent inclusion'. The crucial observation was that the latter could be given matrix scope and still yield the desired reading in the first (universal) sentence of (131)a, as displayed in (131)c (where Exh^{II} is the newly defined exhaustivity operator). This configuration allowed ellipsis to target an operator-free constituent, as was desired in view of the intuitive truth conditions.

Importantly, from the perspective of Blumberg and Goldstein's theory, *both* (130)a and (131)a present a challenge, as in both cases the operator R must be embedded within the disjunctions and must thus be copied by ellipsis, contrary to fact.

Turning to *must*, Blumberg and Goldstein's theory *on its own* makes incorrect predictions for negated sentences, but this is for irrelevant reasons, as independently motivated assumptions about implicatures can address the problem. Specifically, the Strongest Meaning Hypothesis implies that the representation of (132)a should be (132)b, which fails to derive the appropriate diversity inferences. But the latter can be derived as implicatures in view of the alternatives in (132)c: by negating the alternatives *Mary may not study Greek, Mary may not study Latin*, the desired result is obtained.

(132) a. Mary is not required to study Greek or Latin.
=> Mary can study Greek
=> Mary can study Latin
b. not must M λx [Gx ∨ Lx]
c. Alternatives: {not may M λx [Gx ∨ Lx], not may M λx Gx, not may M λx Lx, …}
=> may M λx Gx
=> may M λx Lx

With implicatures at our disposal, the diversity inferences in (128)a, repeated as (133)a, can be analyzed without R: by the assertion, all deontically accessible worlds satisfy *U* or *B*; by the implicatures in (133)b, not all satisfy *U* and not all satisfy *B*, from which it follows that some satisfy *U* and *not B* and some satisfy *B* and *not U*.

(133) a. Mary is required to read Ulysses or Madame Bovary.
=> Mary may read Ulysses and Mary may read Madame Bovary
b. Alternatives: {must M λx Ux, must M λx Bx, …}
=> not must M λx Ux
=> not must M λx Bx

hence with the assertion
=> may M λx Ux, may M λx not Ux, may M λx Bx, may M λx not Bx

While in this case there may be a choice between R-insertion and implicatures, with ellipsis the R-based account encounters difficulties. The problem can be seen in (134)a, where the antecedent cannot contain an embedded R due to the Strongest Meaning Hypothesis. Nonetheless, the elided clause does give rise to this diversity inference, despite the fact that the copied clause is R-free. By contrast, an implicature-based analysis derives the correct result, for instance by postulating the presence of an exhaustivity operator in the unelided part of the positive clause, as displayed in (134)c.

(134) a. Mary is not required to study Greek or Latin, but Bill is.
=> Bill can study Greek, Bill can study Latin
b. not must M λx [Gx $\vee$ Lx]. must B $<\lambda$x [Gx $\vee$ Lx]$>$
c. not must M λx [Gx $\vee$ Lx]. **Exh** must B $<\lambda$x [Gx $\vee$ Lx]$>$

- *Stalnakerian conditions*

Since Bar-Lev and Fox's (2017) implicature-based theory is designed to address problems raised by ellipsis, we do not need to offer an alternative account. Suffice it to say that some of Blumberg and Goldstein's results could, if one wanted, be derived by positing Stalnakerian non-conditions (anti-presuppositions) which could be strengthened into presuppositions and then locally accommodated under some pragmatic conditions.

Let us focus on Free Choice under *may*. The account is initially similar to that given for *x believes [A or B]* in Section 7. The target representation is in (135), with an embedded local context *c'*. We will assume that its value is obtained in the same way as the local context of the embedded clause under *believe*, but with a set of deontic alternatives (written as *Deont*) replacing the set of doxastic alternatives, as shown in (136).

(135) may $^{c'}$[A or B]

(136) **c' =** λw* λw [w* $\in$ C and w $\in$ Deon(w*)]

The Stalnakerian non-triviality conditions appear in (137) and give rise to the candidate strengthenings in (138). All are consistent with the assertion, and (138)b and (138)a' derive the Free Choice inference.[25] When local accommodation is applied, we obtain an at-issue effect, and hence something very close to Blumberg and Goldstein's conditions.

(137) Stalnakerian non-triviality conditions for *May [A or B]*
a. not [$\forall$w*: w* $\in$ C] $\underline{[\forall w: w \in Deon(w^*)]\ \mathbf{A}(w^*)(w) = 1}$
b. not [$\forall$w*: w* $\in$ C] $\underline{[\forall w: w \in Deon(w^*)]\ \mathbf{A}(w^*)(w) = 0}$
a'. not [$\forall$w*: w* $\in$ C] $\underline{[\forall w: w \in Deon(w^*) \text{ and } \mathbf{A}(w^*)(w) = 0]\ \mathbf{B}(w^*)(w) = 1}$
b'. not [$\forall$w*: w* $\in$ C] $\underline{[\forall w: w \in Deon(w^*) \text{ and } \mathbf{A}(w^*)(w) = 0]\ \mathbf{B}(w^*)(w) = 0}$

(138) Candidate strengthenings using Homogeneity relative to the underlined propositions of 42
a. [$\forall$w*: w* $\in$ C] not [$\forall$w: w $\in$ Deon(w*)] **A**(w*)(w) = 1
hence: May not A
b. [$\forall$w*: w* $\in$ C] not [$\forall$w: w $\in$ Deon(w*)] **A**(w*)(w) = 0
hence: May A
a'. [$\forall$w*: w* $\in$ C] not [$\forall$w: w $\in$ Deon(w*) and **A**(w*)(w) = 0] **B**(w*)(w) = 1
hence: May (not A and not B)

[25] In the case of *believe*, which has the force of universal quantification of worlds, the counterpart of (138)a' was inconsistent with the assertive component and couldn't be effected. But *may* has existential rather than universal force, and the problem does not arise.

b'. $[\forall w^*: w^* \in C]$ not $[\forall w: w \in Deon(w^*)$ and $\mathbf{A}(w^*)(w) = 0]$ $\mathbf{B}(w^*)(w) = 0$
hence: May (not A and B)

We caution that these strengthenings are not unproblematic, for two related reasons. First, the presuppositions in (138) are too strong: *may [A or B]* intuitively yields the inference that the *speaker* believes that *may A* and also *may B*, but not that these modal propositions are presupposed. Second, these presuppositions make the at-issue component of *may [A or B]* redundant. This might conceivably explain why the presupposition is automatically accommodated (thus solving the first problem). But an alternative is that these strengthenings do not arise in the first place, and that an implicature is responsible for the Free Choice effect.

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