Covert operators are picked to minimize QuD-ambiguity: the view from *pex* and *only*[1]

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Abstract. Silently drawn scalar implicatures (SI) have an effect similar to that of the overt operator *only*, except for the fact that the two operations divide the work between presupposition and assertion differently (Fox 2007; Bassi et al. 2021 i.a.). Why do the semantic effects of silent SIs and overt *only* appear so stable across languages? This paper proposes that this is linked to ambiguity minimization. Specifically, it argues that (i) SIs and *only* are used to address different Questions under Discussion (QuD; Roberts 2012 i.a.); (ii) covert operations are optional, making it ambiguous which QuD to accommodate; (iii) when two operations are semantically close enough, they compete for covertness, such that the covert operation (if any) should be picked to minimize a QuD-related measure of ambiguity. This eventually predicts SIs to be the preferred covert operation. This approach better motivates the fundamental semantic difference between SIs and *only*; and ultimately constitutes an indirect argument in favor of a presuppositional and grammatical view of SIs.

Keywords: scalar implicatures, exhaustification, Question under Discussion, covertness, parsing ambiguities.

1. Introduction: two approaches to scalar implicatures and a common issue

Scalar implicatures (henceforth **SI**s) arise when a speaker chooses a weaker term (e.g. *some*) on a scale of informational strength, implying that a stronger alternative (e.g. *all*) does not hold; see (1). A distinctive feature of SIs is that they are often optional and can be easily cancelled (Grice, 1989). Within the Neo-Gricean framework (Horn, 1972; Grice, 1975; Gazdar, 1979; Horn, 1984; Sauerland, 2004, i.a.), SIs are taken to be drawn by the pragmatic module of the grammar (i.e. post-compositionally), based on core principles governing cooperative conversations: truthfulness, informativeness, opinionatednes.[2]

(1) a. Jo ate **some** of the cookies. *Uttered Prejacent*
  b. Jo ate **all** of the cookies. *Stronger Alternative*
  c. (1a) $\rightsquigarrow$ Jo did **not** eat **all** of the cookies. $\equiv \neg$ (1b) *Scalar Implicature*
  d. Jo ate **some** of the cookies; in fact he ate **all**. *Canceled SI*

By contrast, within the grammatical framework (Chierchia et al., 2009, 2011; Magri, 2011; Crnič, 2012; Meyer, 2013, 2016; Bar-Lev and Fox, 2017; Fox, 2018; Bassi et al., 2021, i.a.), SIs result from the insertion of a covert syntactic operator often dubbed *exh* (for "exhaustification"). Semantically, *exh* can be taken to conjoin its prejacent (p) with the negation of non-weaker

[1] I would like to thank Amir Anvari, Athulya Aravind, Josh Boivin and Nina Haslinger, as well as the audience of SuB30 for relevant questions and feedback.

[2] In Sauerland (2004), (un)opinionatednes helps derive the optionality of SIs.

alternatives belonging to a set $\mathcal{A}_p$; see (2).[3] The meaning of *exh* is thus close to that of *only*, as illustrated in (3).

(2) $[\![exh]\!] = \lambda p.\ p \wedge \forall q \in \mathcal{A}_p :\ p \not\models q.\ \neg q$

(3) $[\![$*exh*(Jo ate **some** of the cookies)$]\!]$
$\equiv [\![$Jo ate **some** of the cookies$]\!] \wedge \neg\, [\![$Jo ate **all** of the cookies$]\!]$
$\approxeq [\![$Jo ate **only some** of the cookies$]\!]$

The grammatical framework can capture the optionality of SIs by positing that *exh* is optionally merged.[4] Therefore, a sentence in which *exh* can be inserted in one site is in principle ambiguous between two parses: a parse with *exh*, and a parse without. Though the grammatical view proved successful in many subdomains of pragmatics, the existence of *exh* raises an obvious question: does *exh* semantically differ from *only*, and if so, in what sense? There seems to be many empirical advantages to assume that *exh* and *only* convey the same overall information, but cut the pie differently between presupposition and assertion. Under Bassi et al.'s view, *exh* asserts its prejacent and <u>presupposes</u> the negation of non-weaker alternatives. *Exh* was hence dubbed *presuppositional*, and abbreviated *pex*; see (4). The rest of this paper will adopt this view.[5] *pex*'s presuppositions (i.e. SIs) are taken to be easily *accommodated*, i.e. added to the Common Ground, should they not be met in context (Stalnaker 1974 i.a.). By contrast, *only* is often taken to <u>presuppose</u> its prejacent, and to assert the negation of non-weaker alternatives; see (5).[6]

(4) $[\![pex]\!] = \lambda p : \underline{\forall q \in \mathcal{A}_p :\ p \not\models q.\ \neg q}.\ p$ (5) $[\![only]\!] = \lambda p : \underline{p}.\ \forall q \in \mathcal{A}_p :\ p \not\models q.\ \neg q$

Independently of the specific differences between *pex* and *only*, a second question arises: why is *only* robustly overt cross-linguistically, while *exh*/*pex* is not?[7] Specifically, why do overt exhaustifiers robustly presuppose their prejacent, while covert ones–if they are real–do not? This puzzle in fact extends to Neo-Gricean approaches for which there is no such thing as a covert exhaustifier–just a covert pragmatic process: why does this process never backgrounds the proposition under consideration, while appealing to *only* does? Put differently, it is not because the Neo-Gricean view posits that SIs and *only* operate in different realms, that it can explain *why* these two operations divide asserted and backgrounded meaning the way they do.

This paper attempts to properly explain the missing link between (c)overtness and the presupposition-assertion divide in the case of SIs and *only*. It argues that the (c)overtness asymmetry between SIs and *only*[8] can be most easily explained assuming Bassi et al. (2021)'s view,

[3]More sophisticated semantic entries for *exh* restrict the set of negated alternatives to *Innocently Excludable* ones (Fox, 2007), and may also assert *Innocently Includable* alternatives (Bar-Lev and Fox, 2017). Here we focus on cases in which these more sophisticated models are not directly needed.

[4]Alternatively, one can assume that this operator is always merged, but that the alternatives it operates on can be impoverished by *pruning* (Fox and Katzir, 2011; Ivlieva, 2012; Katzir, 2014; Denić, 2023, i.a.).

[5]*exh* also differs from *only* in that it makes *both* its prejacent and additional SIs at-issue; but we will see that this appears less empirically accurate once QuDs are considered; and makes this paper's enterprise less straightforward.

[6]Though see Atlas (1993); Horn (2002); Roberets (2011); Crnič (2024) for more elaborate views on *only*.

[7]One could argue that *pex* may come with overt features, such as pitch accent, and that clefts may in certain respects instantiate *overt* versions of *pex*. This will not be fully ruled out by our approach, which only predicts that, if *pex* or *only* is covert, then it has to be *pex*.

[8]More accurately: between whatever meaning SIs typically convey and whatever meaning *only* typically conveys.

and that, granted this view, it is all a matter of minimizing ambiguity. Ambiguity will be understood in relation to the (implicit) Question under Discussion (henceforth **QuD**; Büring 2003; Roberts 2012; Ginzburg 2012; Riester 2019; Zhang 2022 i.a.). The key new claim is then that, when two operators have the same overall meaning, picking which one should be covert hinges on the minimization of QuD-ambiguity.

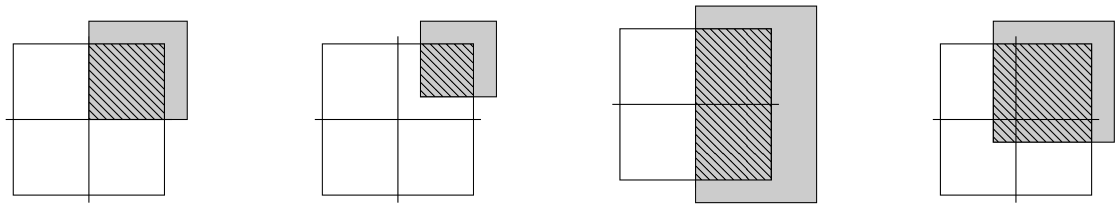
The rest of this paper is structured as follows. Building on the idea that overt and covert exhaustifiers differ in how they divide assertion and presupposition, Section 2 argues that this difference leads speakers to infer different implicit QuDs from parses involving such operators. Section 3 then argues that covert operators, if optional, induce an ambiguity regarding which implicit QuD should be inferred. A measure of QuD-ambiguity is then introduced, according to which *pex* induces less QuD-ambiguity than a putative covert *only* dubbed *conly*–justifying the choice of *pex* as the optimal covert operator. Section 4 extends this line of reasoning to more complex QuD configurations. Section 5 discusses the general implications of this approach and concludes the paper.

2. Exhaustifiers and the (implicit) QuD

2.1. Felicitously addressing QuDs

The Context Set, henceforth **CS** (Stalnaker, 1978) standardly refers to the set of worlds compatible with the premises of the conversation at stake. QuDs are identified with partitions of the CS (Hamblin, 1958; Groenendijk and Stokhof, 1984): sets of non-empty, disjoint subsets of the CS (*cells*), together covering it. Given any set of propositions (sometimes called *alternatives*), a partition of the CS can automatically be derived by grouping into cells the worlds of the CS that agree on all the propositions at stake. We will refer to such partitions induced by sets of alternatives Hamblin-style partitions.

We assume that accommodating a presupposition p on a (partitioned) CS amounts to intersecting it with p (Stalnaker, 1970, 1974; Karttunen, 1974; Heim, 1983). We also build on the crucial observation that accommodated presuppositions should not settle the QuD (Heim, 2015; Aravind et al., 2022; Doron and Wehbe, 2024). Doron and Wehbe's implementation of this principle states that an utterance's assertion should be able to rule out a cell of the partitioned CS obtained *after* accommodating the utterance's presupposition. A useful consequence of this principle is that accommodation should not produce a one-cell QuD, because such a QuD makes it impossible for any non-contradictory assertion to rule out a cell (see Figure 1a and 1b). Figures 1c and 1d show accommodation configurations that are not *a priori* ruled out by Doron and Wehbe's constraint. The next section investigates how this constraint plays out in the context of scalar items like *some* and *all*, potentially carrying presuppositions due to *pex*.



(a) Infelicitous accommodation: updated CS has only 1 cell left.

(b) Infelicitous accommodation: updated CS has only 1 cell left.

(c) Felicitous accommodation: updated CS has 2 cells left.

(d) Felicitous accommodation: updated CS has 4 cells left.

Figure 1: (In)felicitously accommodating p on a 4-cell partition of the CS. Grey rectangles define p. The hatched regions define the partitioned CS after accommodating p.

2.2. *Only some* and *exh some* address distinct QuDs

Assuming the existence of *pex*, and the entries for *pex* and *only* in (4) and (5) respectively, the question-answer pairs in (6) and (7) comply with the principles we just introduced.[9]

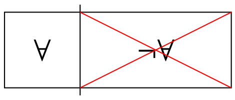
(6) Did Jo eat **all** of the cookies or not?
QuD: | $\forall$ | $\neg\forall$ |
Jo ate { all$^{\checkmark}$, some$^{✗}$, only some$^{\checkmark}$ }

(7) Did Jo eat **some** of the cookies or not?
QuD: | $\exists$ | $\neg\exists$ |
Jo ate { all$^{?}$, some$^{\checkmark}$, only some$^{✗}$}

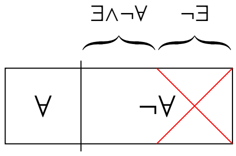
We start with (6). Assuming the QuD in (6) partitions the CS into $\forall$ and $\neg\forall$ worlds, answering with *all* is fine, because *all* is presuppositionless and rules out the $\neg\forall$-cell of the QuD, thus relevantly addressing it (Figure 2a). Answering with *some* however, is infelicitous. Here is why. If *some* is understood literally as $\exists$ (presuppositionless, *pex*-less parse), the answer does not rule out any cell, and so does not relevantly address the QuD (Figure 2b). Understanding *some* as *pex*($\exists$) does not help: in that case, the $\neg\forall$-cell is identified presuppositionally, which does not leave enough possibilities open for the assertion ($\exists$) to rule out a cell (Figure 2c).[10] So either way, *some* does not constitute a felicitous answer. Lastly, answering with *only some* is fine, because the at-issue component of this answer ($\neg\forall$) rules out a cell, even after the presupposition ($\exists$) gets accommodated (Figure 2d).

[9] A similar point is made in Hénot-Mortier (2026) in the context of redundant "scalar" disjunctions.

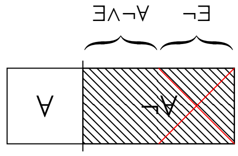
[10] If *exh* had been assumed instead, answering *some* could be understood as *asserting* $\exists \wedge \neg\forall$, which would be relevant though overinformative: $\exists \wedge \neg\forall$ strictly entails the $\neg\forall$-cell. We would thus predict that answering *some* to a *whether all* QuD should be roughly as felicitous as answering *all* to a *whether some* QuD. But the former move is more degraded and "feels" different than the later. This observation favors a *pex* analysis over an *exh* analysis.



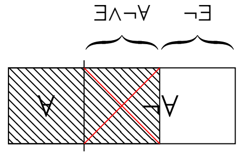
(a) ∀ rules out the ¬∀-cell: ✓



(b) ∃ does not fully rule out any cell: ✗



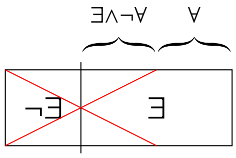
(c) *pex*(∃) does not fully rule out any cell: ✗



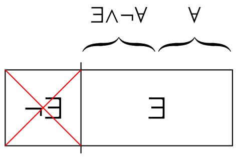
(d) *only*(∃) rules out the (∃∧)¬∀-cell (after accommodation): ✓

Figure 2: (In)felicitously answering a *whether all* QuD. Hatched regions define the partitioned CS obtained after accommodating the answer's presupposition (if any). Crossed-out regions are those ruled out by the answer's assertion (after accommodation, whenever applicable).

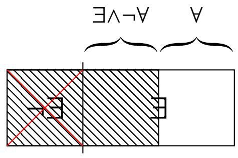
The same kind of reasoning applies to the QuD in (7), which can be taken to partition the CS into ∃ and ¬∃ worlds. Answering with ∀ is slightly degraded, probably due to overinformativeness (Figure 3a). Answering with ∃ is fine, because it rules out the ¬∃-cell whether or not a ¬∀ presupposition (contributed by *pex*) gets accommodated (Figure 3b-3c). Lastly, answering with *only*(∃) is degraded, because it identifies the ∃-cell presuppositionally, leaving no space for the assertion to be relevant (Figure 3d).



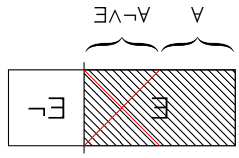
(a) ∀ rules out the ¬∃-cell but "shrinks" the only remaining cell: ?



(b) ∃ rules out the ¬∃-cell: ✓



(c) *pex*(∃) rules out the ¬∃-cell: ✓



(d) *only*(∃) does not fully rule out any cell: ✗

Figure 3: (In)felicitously answering a *whether some* QuD. Same conventions as Figure 2.

2.3. *Only some* and *exh some* evoke distinct QuDs

The previous section illustrated the compatibility between overt questions and assertions. Going one step further, and building on Roberts (2012); Riester (2019); Zhang (2022) i.a., we argue that an assertion may *evoke* the implicit QuD(s) it could felicitously address. The patterns in (6-7) then suggest that utterances conveying *all* and *only some* may evoke a QuD of the form {∀, ¬∀}, while an utterance conveying *some* may evoke a QuD of the form {∃, ¬∃}. There are of course many other possibilities, depending on e.g. focus.[11] For simplicity we will focus for now on two-cell "polar" QuDs.

Building on Hénot-Mortier (2025, 2026) we assume that evoked QuDs are defined on the CS *updated with whatever presupposition the utterance carries*. So, an assertion A presupposing p, will evoke a QuD whose cells are inferred from A, but defined on the CS intersected with

[11] For instance, focus on *cookies* in (1), may induce a partition of the CS according to what Jo ate. It can be shown however that considering these alternative QuDs does not fundamentally affect our subsequent predictions, because such QuDs may be equally raised by utterances involving *pex* and *only* at the same insertion site.

p. Additionally, A and $\neg A$ are taken to evoke the same implicit QuDs. This predicts *all*, literal *some*, *pex some*, and *only some* to evoke distinct QuDs–see Table 1. Specifically, $\exists$ and *pex*($\exists$) evoke the same QuD "structure", but *pex*($\exists$) defines it on a smaller CS entailing its presupposition ($\neg\forall$). Likewise, $\forall$ and *only*($\exists$) evoke the same QuD structure, but *only*($\exists$) defines it on a smaller CS entailing its presupposition ($\exists$).

	Parse	Assertion	Presupposition	QuD
(i)	$\forall$	$\forall$	-	$\boxed{\forall}\boxed{\neg\forall}$
(ii)	$\exists$	$\exists$	-	$\boxed{\exists}\boxed{\neg\exists}$
(iii)	*pex*($\exists$)	$\exists$	$\neg\forall$	$\boxed{\exists \wedge \neg\forall}\boxed{\neg\exists}$
(iv)	*only*($\exists$)	$\neg\forall$	$\exists$	$\boxed{\forall}\boxed{\neg\forall \wedge \exists}$

Table 1: QuDs inferred from utterances involving *some* and *all*, with or without *pex*/*only*.

It thus appears that $\exists$ and *pex*($\exists$) share the same evoked QuD structure, while $\exists$ and *only*($\exists$) do not. With this difference in mind, the next section argues that covert operators create ambiguities regarding which QuD should be inferred, and shows that *pex* creates less QuD-ambiguity than a covert counterpart of *only*.

3. Parsing ambiguities trigger QuD ambiguities

3.1. Covert operators generate QuD ambiguities

Recall that a sentence in which *pex* can be inserted in one site is in principle ambiguous between two parses: a parse with *pex*, and a parse without. *pex*-able sentences in turn induce an ambiguity regarding which implicit QuD should be inferred. An utterance of *some* for instance, may evoke a QuD addressed by $\exists$ (typically, $\{\exists, \neg\exists\}$, see Table 1-(ii)) or by *pex*($\exists$) (typically $\{\exists, \exists \wedge \neg\forall\}$, see Table 1-(iii)). Of course, this kind of ambiguity does not arise with overt operators, like *only*. The possible QuDs evoked by *all*, *some*, and *only some* utterances are summarized in Table 2.

What would happen if *pex* were overt, and *only*, covert? We define ***opex*** as the putative **o**vert realization of *pex*, and ***conly*** as the putative **c**overt realization of *only*. We assume that languages are endowed with at most one covert exhaustifier,[12] *pex* or *conly*. In a language with *opex* and *conly*, an utterance of *some* may be parsed as $\exists$ or *conly*($\exists$), the latter presupposing $\exists$, and asserting $\neg\forall$. This induces an ambiguity between a $\{\exists, \neg\exists\}$, and a $\{\forall, \exists \wedge \neg\forall\}$ QuD. In that kind of language, an utterance of *opex some* would not lead to a parsing-induced QuD-ambiguity, since *opex* is posited overt. This is summarized in Table 3.

[12] Otherwise, it would be impossible to infer the status of SIs–at-issue or presuppositional.

Utterance	Parse	QuD
all	$\forall$	$\boxed{\forall}\boxed{\neg\forall}$
some	$\exists$	$\boxed{\exists}\boxed{\neg\exists}$
	pex($\exists$)	$\boxed{\exists \wedge \neg\forall}\boxed{\neg\exists}$
only some	*only*($\exists$)	$\boxed{\forall}\boxed{\neg\forall \wedge \exists}$

Table 2: Attested case: QuDs evoked by utterances containing *all*, *some* (ambiguous between $\exists$ and *pex*($\exists$)), and *only some*.

Utterance	Parse	QuD
all	$\forall$	$\boxed{\forall}\boxed{\neg\forall}$
some	$\exists$	$\boxed{\exists}\boxed{\neg\exists}$
	conly($\exists$)	$\boxed{\forall}\boxed{\neg\forall \wedge \exists}$
opex some	*opex*($\exists$)	$\boxed{\exists \wedge \neg\forall}\boxed{\neg\exists}$

Table 3: Unattested case: QuDs evoked by utterances containing *all*, *some* (ambiguous between $\exists$ and *conly*($\exists$)), and *opex some*.

A language with the two overt operators *opex* and *only* would be characterized by minimal operator-induced QuD-ambiguity, but at the cost of prolixity. The next section defines a relative measure of QuD-ambiguity, and shows that the state of affairs described in Table 2, which is the cross-linguistically attested one, leads to comparatively less QuD-ambiguity than the unattested state of affairs described in Table 3.

3.2. Covert operators can be compared w.r.t their potential for QuD-ambiguity

When an utterance may contain a covert operator, e.g. *pex*, or *conly*, an ambiguity arises regarding the implicit QuD(s) inferred from the utterance. In the attested case (Table 2), the two possible QuDs produced by the parsing ambiguity share a cell (the $\neg\exists$-cell), while in the unattested case (Table 3), they do not. In that sense, the attested configuration induces less ambiguity than the unattested configuration: in the former, at least we know that the QuD evoked by a covertly exhaustifiable utterance involves a $\neg\exists$-cell.

More generally, if U and U' are two utterances, then U is less QuD-ambiguous than U', if the questions evoked by (the different parses of) U are "closer" to each other, than those evoked by U' are close to each other. Closeness is understood in terms of sets of matching cells: "close" questions have a lot of cells in common. A set of questions $\mathcal{Q}$ is then less ambiguous than another set of questions $\mathcal{Q}'$, if the set of cells that all members of $\mathcal{Q}$ have in common, *contains* the set of cells that all members of $\mathcal{Q}'$ have in common. (8) implements this in the form of a partial order between sets of questions. The set of cells that questions have in common, corresponds to their grand intersection; see (9).

(8) **Relative QuD-ambiguity between sets of questions**. A set of questions $\mathcal{Q}$ is less ambiguous than another set $\mathcal{Q}'$ ($\mathcal{Q} \prec \mathcal{Q}'$) iff $\mathcal{M}(\mathcal{Q}) \supset \mathcal{M}(\mathcal{Q}')$

(9) **Matching cells**. Let $\mathcal{Q}$ be a set of questions. $\mathcal{M}(\mathcal{Q}) = \{c | \, \forall Q \in \mathcal{Q}.\ c \in Q\} = \bigcap_{Q \in \mathcal{Q}} Q$

Based on this idea, we can define a relative measure of QuD-ambiguity induced by covert operators like *pex* or *conly*. (10) defines the set of questions induced by the absence or presence of a specific covert operator, at a fixed site, in a fixed utterance. (11) then builds (8) and (10) to define a relative measure of QuD-ambiguity between covert operators in the context of a fixed utterance. It will allow us to compare covert operators in terms of their potential for QuD-ambiguity.

(10) **Questions induced by a covert operator**. Let U be an utterance, Φ a covert operator and S a site in U where Φ could be inserted. Let U' be the result of the insertion of Φ at site S in U. The questions induced by the covertness of Φ at site S in U, noted $\mathcal{Q}(U, S, \Phi)$ corresponds to the set of questions evoked by either U or U'.

(11) **Comparing covert operators Re:QuD-ambiguity**. Let U be an utterance, Φ and Ψ covert operators and S a site in U where Φ or Ψ could be inserted. Φ induces less QuD-ambiguity than Ψ at site S in U iff $\mathcal{Q}(U, S, \Phi) \prec \mathcal{Q}(U, S, \Psi)$.

Let us first review a simple example with Φ=*pex* and Ψ=*conly* in a simple matrix environment ($\exists$). Considering *pex* first, applying (10) to a matrix *some* utterance yields the set of questions evoked by $\exists$ and *pex*($\exists$), i.e. $\mathcal{Q}(\textit{some}, \textit{root}, \textit{pex})$ is the set $\{\{\exists, \neg\exists\}, \{\exists \wedge \neg\forall, \neg\exists\}\}$. The two questions in this set share the $\neg\exists$-cell, meaning, $\mathcal{M}(\mathcal{Q}(\textit{some}, \textit{root}, \textit{pex})) = \{\neg\exists\}$. Now, considering *conly*, applying (10) to the same *some* utterance yields the set of questions evoked by $\exists$ and *conly*($\exists$), i.e. $\mathcal{Q}(\textit{some}, \textit{root}, \textit{conly})$ is the set $\{\{\exists, \neg\exists\}, \{\forall, \neg\forall \wedge \exists\}\}$. The questions in this set do not have any cell in common, meaning, $\mathcal{M}(\mathcal{Q}(\textit{some}, \textit{root}, \textit{conly})) = \emptyset$. Because $\emptyset \subset \{\exists\} = \mathcal{M}(\mathcal{Q}(\textit{some}, \textit{root}, \textit{pex}))$, we conclude $\mathcal{Q}(\textit{some}, \textit{root}, \textit{pex}) \prec \mathcal{Q}(\textit{some}, \textit{root}, \textit{conly})$ as per (8). *pex* therefore induces less QuD-ambiguity than *conly* in the context of a simple *some*-utterance, as per (11). The next section is an attempt to generalize this kind of claim to an entire language–providing a metric according to which *pex* is overall less QuD-ambiguous than *conly*.

3.3. Semantically similar operators "compete" for covertness

In order to compare two covert operators' *general* potential for QuD-ambiguity, the result established for $\exists$ (interpreted as *pex*($\exists$) or *conly*($\exists$)) in the previous section should extend to the entire language. Ultimately, this should explain why certain covert operators like *pex* deserve to be part of the grammar of a language, while others, like *conly*, do not. The key intuition we build on, is that languages attempt to minimize overall QuD-ambiguity when "deciding", between semantically similar covert operators, which one should be preferably added to their grammar. Specifically, (12) claims that a covert operator leading to comparatively less QuD-ambiguity (as measured by $\prec$) should be preferred by the grammar. A preferred covert operator may not be better across the board, $\prec$ being a partial order. Rather, it should *sometimes* be better (12i), and *never* be worse (12ii), than other similar covert operators when it comes to QuD-ambiguity.

(12) **Minimize QuD-ambiguity**. Let Φ and Ψ be two covert operators s.t. for any utterance U, inserting Φ or Ψ at the same site, leads to the same CS after presupposition and assertion have been processed. Then, Φ should be preferred by the grammar iff:
   (i). Φ sometimes induces less QuD-ambiguity than Ψ, meaning, there is an utterance U and a site S in U in which Φ or Ψ can be inserted, s.t. $\mathcal{Q}(U, S, \Phi) \prec \mathcal{Q}(U, S, \Psi)$.
   (ii). Ψ never induces less QuD-ambiguity than Φ, meaning, for no utterance U and insertion site S in U in which Φ or Ψ can be inserted $\mathcal{Q}(U, S, \Psi) \prec \mathcal{Q}(U, S, \Phi)$.

A covert operator being "preferred by the grammar" does not mean that every single grammar

will pick that operator–a grammar may only pick overt operators instead. Rather, it means that *if* the grammar picks a covert operator, it will be that operator.
Given our toy model of evoked QuDs, (12) should predict Φ=*pex* to be preferred over Ψ=*conly*, which implies that, if a language has a covert exhaustifier, it should be of the *pex* type. First, (12i) is verified by simple *some* utterances: we already showed that $Q(\textit{some}, \textit{root}, \textit{pex}) \prec Q(\textit{some}, \textit{root}, \textit{conly})$.
Second, systematically verifying (12ii)–a universal statement over all utterances–would require a more complete, compositional model of QuDs evoked by complex sentences,[13] and of their interaction with presupposition projection. Without diving into the details, it seems reasonable to assume that questions evoked by complex sentences are derived from those evoked by their subcomponents (*compositionality*), subdividing cells in the process rather than merging them (*specificity increasing with complexity*). Then, given that QuDs evoked by a weaker scalemate p and by $\textit{pex}(p)$ share a cell ($\neg p$), while those evoked by p and $\textit{conly}(p)$ do not, more complex utterances involving p will either lead to incomparable sets of matching cells, or sets giving an advantage to *pex* over *conly*.[14]

Before jumping to the next section, let us note that our proof of (12i) (a proof of existence) easily extends to any pair of scalemates $\langle p, p^+\rangle$, each evoking a polar QuD, and such that $p^+ \vDash p$. In all such configurations, p's and $\textit{pex}(p)$'s QuDs will share a $\neg p$ cell, while p's and $\textit{conly}(p)$'s QuDs will share no cell, leading us to conclude that $Q(p, \textit{root}, \textit{pex}) \prec Q(p, \textit{root}, \textit{conly})$, meaning, *pex* creates less QuD-ambiguity when applied to p than *conly* does. This in particular applies to "reversed" scales, like $\langle\neg\forall, \neg\exists\rangle$. An utterance of $\neg\forall$ can be taken to evoke a $\{\forall, \neg\forall\}$ QuD. Additionally, $\textit{pex}(\neg\forall)$ typically asserts $\neg\forall$ and presupposes $\neg\neg\exists \equiv \exists$, while $\textit{conly}(\neg\forall)$ could be taken to assert $\exists$ and presuppose $\neg\forall$.[15] We then derive that $\textit{pex}(\neg\forall)$ evokes a $\{\forall, \exists \wedge \neg\forall\}$ QuD–sharing a $\forall$ cell with the prejacent's QuD; while $\textit{conly}(\neg\forall)$ evokes a $\{\exists \wedge \neg\forall, \neg\exists\}$ QuD–sharing no cell with the prejacent's QuD. Since $\emptyset \subset \{\forall\}$, $Q(\textit{not all}, \textit{root}, \textit{pex}) \prec Q(\textit{not all}, \textit{root}, \textit{conly})$, and the above generalization about $\langle p, p^+\rangle$ scalemates is verified on the reversed $\langle\neg\forall, \neg\exists\rangle$ scale.

This next section explores the predictions of (12) when more complex implicit QuDs are considered, separately, and then, simultaneously.

4. Expanding the pool of potential QuDs

[13] Such a model is sketched for a fragment of the language in Hénot-Mortier (2025).

[14] Here is the sketch of a proof assuming no further presupposition accommodation. Locally, $\exists$, $\textit{pex}(\exists)$ and $\textit{conly}(\exists)$ evoke $\{\neg\exists, \exists\}$, $\{\neg\exists, \exists \wedge \neg\forall\}$, and $\{\exists \wedge \neg\forall, \forall\}$ respectively. We assume that such expressions, when embedded within the same bigger environment E, evoke potentially finer-grained QuDs derived *via* the same partition function $\mathcal{P}$. $\mathcal{P}$ maps a cell c (set of worlds) into a set of sub-cells corresponding to a partition of c. So $E(\exists)$, $E(\textit{pex}(\exists))$ and $E(\textit{conly}(\exists)$ evoke $\mathcal{P}(\neg\exists) \cup \mathcal{P}(\exists)$, $\mathcal{P}(\neg\exists) \cup \mathcal{P}(\exists \wedge \neg\forall)$, and $\mathcal{P}(\exists \wedge \neg\forall) \cup \mathcal{P}(\forall)$ respectively. Then, the set of matching cells between $E(\exists)$'s QuD and $E(\textit{pex}(\exists))$'s QuD is a superset of $\mathcal{P}(\neg\exists)$, i.e. contains cells overlapping with $\neg\exists$. Additionally, the set of matching cells between $E(\exists)$'s QuD and $E(\textit{conly}(\exists))$'s QuD does not contain any cell overlapping with $\neg\exists$, simply because $\mathcal{P}(\exists \wedge \neg\forall) \cup \mathcal{P}(\forall)$ ($E(\textit{conly}(\exists))$'s QuD) does not overlap with $\neg\exists$. So, it is impossible for the set of matching cells between $E(\exists)$'s QuD and $E(\textit{conly}(\exists))$'s QuD to contain the set of matching cells between $E(\exists)$'s QuD and $E(\textit{pex}(\exists))$'s QuD, meaning, *conly* cannot induce less QuD-ambiguity than *pex* in E. Note that this result may be challenged if the CS entails $\exists$, making the advantage of *pex* over *conly*, materialized as the set of matching cells $\mathcal{P}(\neg\exists)$, disappear. However, it is unlikely (*pex*) *some* would be used in that context in the first place.

[15] We do not address the fact that *only not all* is infelicitous; we can focus our attention on covert operators.

4.1. Three-cell partitions in induced by scalemates

An obvious extension of our toy QuD model integrates three-way, Hamblin-style partitions of the CS induced by scalar pairs like $\langle\exists, \forall\rangle$. This is exemplified by the question-answer pair in (13), in which $\exists \wedge \neg\forall$ is made relevant. In such cases, *all*, *some*, and *only some* constitute equally felicitous answers.

(13) Did Jo eat **all**, or just **some** of the cookies?
QuD: | $\forall$ | $\exists \wedge \neg\forall$ | $\neg\exists$ |
Jo ate { all✓, some✓, only some✓ }

Based on (13), both $\exists$ and $\forall$ appear compatible with a $\{\forall, \exists \wedge \neg\forall, \neg\exists\}$ QuD. So let us assume that in such a case, both $\exists$ and $\forall$ evoke this three-cell $\{\forall, \exists \wedge \neg\forall, \neg\exists\}$ QuD. Given how evoked QuDs and presuppositions are thought to interact, we conclude that *pex*($\exists$) may evoke a $\{\exists \wedge \neg\forall, \neg\exists\}$ QuD (obtained by accommodating $\neg\forall$ on $\exists$'s evoked QuD), while *(c)only*($\exists$) may evoke a $\{\forall, \exists \wedge \neg\forall\}$ QuD (obtained by accommodating $\exists$ on $\forall$'s evoked QuD). These QuD structures happen to correspond to those previously derived for these operators back in Section 2 when assuming $\exists$ and $\forall$ both evoked "polar" (yet distinct) questions.
The QuDs evoked by *pex*($\exists$) and *(c)only*($\exists$) then both share a $\exists \wedge \neg\forall$ cell with the QuD evoked by $\exists$. In other words, their respective sets of matching cells with the QuD evoked by their prejacent are equal: $\mathcal{M}(Q(\textit{some}, \textit{root}, \textit{pex})) = \mathcal{M}(Q(\textit{some}, \textit{root}, \textit{conly})) = \{\exists \wedge \neg\forall\}$. These sets being equal means that they are not in any kind of *strict* subset relation. This in turn implies, as per (8) and (11), that *pex*'s and *conly*'s potentials for QuD-ambiguity are incomparable in that particular setting–neither $Q(\textit{some}, \textit{root}, \textit{pex}) \prec Q(\textit{some}, \textit{root}, \textit{conly})$ nor $Q(\textit{some}, \textit{root}, \textit{conly}) \prec Q(\textit{some}, \textit{root}, \textit{pex})$ holds.
The existence of three-cell QuD structures like the one suggested by (13) is therefore uninformative as to which covert operator, among *pex* and *conly*, minimizes QuD-ambiguity, and as such should be preferred by the grammar. Importantly for us, it does not constitute evidence that *conly* should be preferred. The next section explores similar-looking QuD configurations, induced by the existence of a third alternative, beyond $\exists$ and $\forall$.

4.2. Cases in which more than two scalemates are relevant

Though $\forall$ is probably the most salient alternative to $\exists$, other alternatives to $\exists$ of intermediate strength may be relevant; for instance *most* (now abbreviated M). This observation extends to other scales, e.g. $\langle$*might*, *may*, *must*$\rangle$, $\langle$*sometimes*, *often*, *always*$\rangle$. How does the existence of intermediate alternatives influence evoked QuDs, and in turn, our model of QuD-ambiguity and its predictions? (14) features question-answer pairs in which M is directly relevant to the QuD, creating partitions with more than two cells. We will first focus on the competition between *pex* and *conly* on a $\exists$-prejacent, considering these two QuDs successively.[16] We will then investigate the competition between these operators when applied to a M-prejacent, given the QuD in (14b). This will ultimately lead us to derive a generalization about the QuD-ambiguity induced by *pex* vs. *conly*, given Hamblin-style QuDs induced by an arbitrary number of scalemates.

[16]Interestingly, *only most* or *just most* do not sound very good in (14), even if the QuD is directly about M and $\forall$. We do not address this issue here.

(14) a. Did Jo eat **most**, or just **some** of the cookies?
QuD: | M | $\exists \wedge \neg M$ | $\neg\exists$ |
Jo ate { all$^?$, most✓, some✓, only some✓}
b. Did Jo eat **all**, **most**, or just **some** of the cookies?
QuD: | $\forall$ | $M \wedge \neg\forall$ | $\exists \wedge \neg M$ | $\neg\exists$ |
Jo ate { all✓, most✓, some✓, only some✓}

In (14a), $\exists$ and M, but not $\forall$, are relevant to the QuD. It is thus reasonable to assume that exhaustifying $\exists$ in that context would lead to infer $\neg M$, instead of the usual and logically weaker $\neg\forall$. This inference is at-issue if produced by *(c)only* and presupposed (yet easily accommodated) if produced by *pex*. Moreover, *some*, *only some*, and *most* in (14a) appear compatible with the contextually provided QuD, $\{M, \exists \wedge \neg M, \neg\exists\}$. So, in that setting, we take $\exists$ and M to evoke the same $\{M, \exists \wedge \neg M, \neg\exists\}$ QuD. Given how evoked QuDs and presuppositions are thought to interact, we conclude that *pex*($\exists$) may evoke a $\{\exists\wedge\neg M, \neg\exists\}$ QuD (obtained by accommodating $\neg M$ on $\exists$'s QuD), while *(c)only*($\exists$) may evoke a $\{M, \exists\wedge\neg M\}$ QuD (obtained by accommodating $\exists$ on M's QuD). This is summarized in Table 4. The QuD evoked by *pex*($\exists$) then shares a $\exists\wedge\neg M$ and a $\neg\exists$ cell with the QuD evoked by $\exists$; while the QuD evoked by *(c)only*($\exists$) shares a M and a $\exists \wedge \neg M$ cell with it. Therefore, the sets of matching cells at stake merely overlap, which in turn implies that *pex*'s and *conly*'s potentials for QuD-ambiguity are incomparable in that setting.
Turning to (14b), whereby $\exists$, M and $\forall$ are all relevant to the QuD. Again here, it is reasonable to assume that exhaustifying $\exists$ would lead to infer $\neg M$. And in that case again, utterances of *some*, *only some*, and *most* appear compatible with the contextually provided QuD, $\{\forall, M \wedge \neg\forall, \exists \wedge \neg M, \neg\exists\}$. This allows us to conclude that *pex*($\exists$) and *(c)only*($\exists$) may evoke, respectively, a $\{\exists \wedge \neg M, \neg\exists\}$ and a $\{\forall, M \wedge \neg\forall, \exists \wedge \neg M\}$ QuD after their respective presuppositions get accommodated on the CS. This is summarized in Table 5. The QuD evoked by *pex*($\exists$) then shares a $\exists \wedge \neg M$ and a $\neg\exists$ cell with the QuD evoked by $\exists$; while the QuD evoked by *(c)only*($\exists$) shares a $\forall$, a $M \wedge \neg\forall$, and a $\exists \wedge \neg M$ cell with it. Thus once again, the sets of matching cells at stake merely overlap, which in turn implies that *pex*'s and *conly*'s potentials for QuD-ambiguity are incomparable in that setting.

Parse	Evoked QuD		
$\exists$	M	$\exists \wedge \neg M$	$\neg\exists$
pex($\exists$)		$\exists \wedge \neg M$	$\neg\exists$
only($\exists$)	M	$\exists \wedge \neg M$	

Table 4: QuD s evoked by $\exists$, *pex*($\exists$) and *only*($\exists$), assuming $\exists$ and M are relevant while $\forall$ is not, as in (14a).

Parse	Evoked QuD			
$\exists$	$\forall$	$M \wedge \neg\forall$	$\exists \wedge \neg M$	$\neg\exists$
pex($\exists$)			$\exists \wedge \neg M$	$\neg\exists$
only($\exists$)	$\forall$	$M \wedge \neg\forall$	$\exists \wedge \neg M$	

Table 5: QuD s evoked by $\exists$, *pex*($\exists$) and *only*($\exists$), assuming $\exists$, M and $\forall$ are relevant, as in (14b).

Before moving on, let us study one last case, in which *pex* and *(c)only* apply to M instead of $\exists$. (14b) constitutes a context in which this can be done non-trivially: because $\forall$ is relevant to the QuD, exhaustifying M likely produces a $\neg\forall$ inference, made at-issue by *(c)only* and presupposed by *pex*. So *pex*(M) can be taken to assert M and presuppose $\neg\forall$, and *(c)only*(M), to assert $\neg\forall$ and to presuppose M. Additionally in (14b), M and $\forall$ both appear compatible with the contextually provided QuD, $\{\forall, M \wedge \neg\forall, \exists \wedge \neg M, \neg\exists\}$. This allows us to derive QuDs for *pex*(M) and *(c)only*(M), by accommodating, respectively, $\neg\forall$ and M on the $\{\forall, M \wedge \neg\forall, \exists \wedge \neg M, \neg\exists\}$ QuD. The outcome of this process is summarized in Table 6, which shows that the QuD evoked by *pex*(M) shares a $M \wedge \neg\forall$, a $\exists \wedge \neg M$, and a $\neg\exists$ cell with the QuD evoked by M; while the QuD evoked by *(c)only*(M) shares a $\forall$, and a $M \wedge \neg\forall$ cell with it. This pattern appears similar to that of Table 5, the only difference being that it is slightly shifted to the left (which stems from the fact that the prejacent now at stake, M, is slightly stronger than $\exists$). Once again, the mere overlap between the sets of matching cells at stake allows us to conclude that *pex*'s and *conly*'s potentials for QuD-ambiguity are incomparable in that setting.

Parse	Evoked QuD			
M	$\forall$	$M \wedge \neg\forall$	$\exists \wedge \neg M$	$\neg\exists$
pex(M)		$M \wedge \neg\forall$	$\exists \wedge \neg M$	$\neg\exists$
only(M)	$\forall$	$M \wedge \neg\forall$		

Table 6: QuD s evoked by M, *pex*(M) and *only*(M), assuming $\exists$, M and $\forall$ are relevant, as in (14b).

The patterns exhibited by Tables 4, 5 and 6 appear generalizable to an arbitrary number of scalarly ordered alternatives inducing a Hamblin-style QuD; for any alternative p that is not an endpoint on the scale, *pex*(p) and *(c)only*(p) will evoke QuDs which merely overlap on the cell corresponding to the exhaustified meaning of p according to that scale, conflating presupposition and assertion.[17] This result, just like the one established in the previous section, may appear negative: it implies that considering more complex implicit QuDs makes *pex* and *conly* consistently incomparable. But one must keep in mind that these results in fact contribute to corroborating our claim that *pex* minimizes QuD ambiguity *overall*; since we have already shown that *pex* minimizes QuD-ambiguity for some utterance/QuD (condition (12i), all we have to verify is that *conly* never does so on other utterances/QuD (condition (12ii). The observations laid out in this section and the previous one corroborate this claim.

This line of reasoning however has a shortcoming: it holds on a case-by-case basis. Each time, we considered that the bare utterances (of $\exists$, M, or $\forall$) would only evoke one fixed QuD, which, intersected with the relevant presuppositions, would then yield QuDs for the prejacent's *pex*-ed and *(c)only*-ed counterparts. The next section will investigate whether this reasoning is still valid under the assumption that a given utterance may evoke multiple candidate QuDs *at the same time* (e.g., the *set* of QuDs $\{\{\exists, \neg\exists\}, \{\forall, \exists \wedge \neg\forall, \neg\exists\}, \{M, \exists \wedge \neg M, \neg\exists\}, \{\forall, M \wedge \neg\forall, \exists \wedge \neg M, \neg\exists\}\}$).

4.3. Generalizing to multiple implicit QuDs

Instead of reasoning on fixed QuDs evoked by each parse, we now explore the possibility that any given utterance may evoke multiple QuDs at the same time. For simplicity, let us assume that M is not relevant, and that an utterance of $\exists$ may evoke a "polar" QuD of the form $\{\exists, \neg\exists\}$ (that we investigated separately back in Sections 2 and 3), as well as a three-cell Hamblin-style QuD induced by $\exists$ along with its scalemate $\forall$: $\{\forall, \exists \wedge \neg\forall, \neg\exists\}$ (investigated separately in Section 4.1). Likewise, we take that an utterance of $\forall$ may evoke both a polar $\{\forall, \neg\forall\}$ QuD and a

[17] I.e. $p \wedge \neg p^+$, with p^+ the immediately stronger alternative to p on the relevant scale.

three-cell $\{\forall, \exists \wedge \neg\forall, \neg\exists\}$ QuD. Let us refer to these four different partitions of the CS (two for $\exists$, two for $\forall$) as, respectively, $Q_{\exists,1}$, $Q_{\exists,2}$, $Q_{\forall,1}$, $Q_{\forall,2}$. We have $Q_{\exists,2} = Q_{\forall,2}$.
QuDs for *pex*($\exists$) and *conly*($\exists$) can be derived from these QuDs. Recall that a QuD for *pex*($\exists$) is derived from a QuD for $\exists$ (*pex*($\exists$)'s assertion) by intersecting it with $\neg\forall$ (*pex*($\exists$)'s presupposition); this is done on $Q_{\exists,1}$ and $Q_{\exists,2}$ below. Regardless of which QuD got considered for $\exists$, the derived QuD for *pex*($\exists$) will invariably be $\{\exists \wedge \neg\forall, \neg\exists\}$.

$Q_{\exists,1}$ =

$\exists$	$\neg\exists$

↓ accommodating $\neg\forall$

$Q_{pex(\exists),1}$ =

$\exists \wedge \neg\forall$	$\neg\exists$

$Q_{\exists,2}$ =

$\forall$	$\exists \wedge \neg\forall$	$\neg\exists$

↓ accommodating $\neg\forall$

$Q_{pex(\exists),2}$ =

$\exists \wedge \neg\forall$	$\neg\exists$

Similarly a QuD for *conly*($\exists$) is derived from a QuD for $\forall$ (*conly*($\exists$)'s assertion) by intersecting it with $\exists$ (*conly*($\exists$)'s presupposition); this is done on $Q_{\forall,1}$ and $Q_{\forall,2}$ below. Regardless of which QuD got considered for $\forall$, the derived QuD for *conly*($\exists$) will invariably be $\{\forall, \exists \wedge \neg\forall\}$.

$Q_{\forall,1}$ =

$\forall$	$\neg\forall$

↓ accommodating $\exists$

$Q_{conly(\exists),1}$ =

$\forall$	$\exists \wedge \neg\forall$

$Q_{\forall,2}$ =

$\forall$	$\exists \wedge \neg\forall$	$\neg\exists$

↓ accommodating $\exists$

$Q_{conly(\exists),2}$ =

$\forall$	$\exists \wedge \neg\forall$

Let us now evaluate *pex*'s and *conly*'s potential for QuD-ambiguity, given their respective evoked QuDs, and the now multiple QuDs evoked by the bare prejacent $\exists$. Recall that, according to (10) two operators' potentials for QuD-ambiguity can be compared by comparing the sets of matching cells between the QuDs induced by these operators, and the prejacent's QuD. To compute sets of matching cells, (8-10) proposed to gather together all the QuDs evoked by the parses with an without the operator, and to take their grand intersection.
Starting with *pex*, the set of questions evoked by both $\exists$ and *pex*($\exists$) is now $\{Q_{\exists,1}, Q_{\exists,2}, Q_{pex(\exists),1}\}$ (since $Q_{pex(\exists),1}$=$Q_{pex(\exists),2}$). This leads to a set of matching cells $Q_{\exists,1} \cap Q_{\exists,2} \cap Q_{pex(\exists),1} = \{\neg\exists\}$, $\neg\exists$ being the only cell shared among the three QuDs. Turning to *conly*, the set of questions evoked by both $\exists$ and *conly*($\exists$) is now $\{Q_{\exists,1}, Q_{\exists,2}, Q_{conly(\exists),1}\}$ (since $Q_{conly(\exists),1}$=$Q_{conly(\exists),2}$). This leads to a set of matching cells $Q_{\exists,1} \cap Q_{\exists,2} \cap Q_{conly(\exists),1} = \emptyset$, no cell being shared between $Q_{\exists,1}$ and $Q_{conly(\exists),1}$, and *a fortiori* among all three QuDs. Because $\emptyset \subset \{\neg\exists\}$, we derive $\mathcal{Q}(some, root, pex) \prec \mathcal{Q}(some, root, conly)$, just as we did in Section 3. In other words, considering that parses may evoke multiple implicit QuDs at the same time does not seem to jeopardize (11)'s predictions.

This can be shown to extend to cases in which even more Hamblin-style, alternative-induced QuDs are considered simultaneously; as soon as all QuDs evoked by $\exists$ involve a $\neg\exists$ cell (which seems very reasonable), QuD(s) derived for *pex*($\exists$) will match that cell, and QuD(s) derived for *conly*($\exists$) will not (they will in fact exclude that subspace of the CS altogether). Consequently, *pex*'s and *conly*'s potentials for QuD-ambiguity will be either incomparable, or give an advantage to *pex*. This result is interesting, because it only hinges on very reasonable assumptions about ∃'s evoked QuDs. No further assumptions are warranted regarding, e.g. ∀'s evoked QuDs. Even more generally, this pattern extends to scales of the form $\langle ..., p, p^+, ... \rangle$

5. Discussion and outlook

This paper developed and formalized the idea that semantically similar objects, like *pex* and *only*, somehow "compete" for covertness: none, or only one of these operators can be covert in a given language. We moreover argued that the covert operator, if any, is chosen by the grammar to mimimize the QuD-ambiguity induced by its covertness. QuD-ambiguity was defined as a relative and partial measure, based on sets of matching cells between potential implicit questions. Sets of matching cells were identified with the grand intersection of the union of all the potential QuDs evoked by a prejacent, or by that prejacent passed as argument to a covert operator. From a game-theoretic perspective, computing and comparing sets of matching cells to assess QuD-ambiguity can be understood as performing a min-max strategy: one attempts to extract the maximal amount of relevant information (cells) that candidate QuDs have in common, making minimal assumptions about the origin and derivation of these QuDs (i.e. actively considering the possibility of QuD optionality, and parsing ambiguities). From a more technical standpoint, note that gathering all the QuDs evoked by the two parses (with and without the target covert operator) in the same set before finding their common denominators (matching cells) was probably the most straightforward implementation of the concept of "set of matching cells". Whether it is the most *empirically* accurate implementation however (especially under QuD optionality[18]), is left for future work.

The covertness asymmetry between *pex* and *only* was then cashed out by comparing how the insertion of these operators in any given utterance "shifts" the original QuD evoked by that utterance; *pex* was shown to be less of a QuD "shifter" than *(c)only*. This can be traced back to how *pex* and *(c)only* divide up the work between presupposition and assertion: *pex* keeps the assertion of its prejacent at-issue, and contributes additional SIs presuppositionally, while *only* systematically backgrounds its prejacent's original assertion, contributing additional SI-like inferences at the assertoric level. Relating this merely *descriptive* difference between *pex*'s and *only*'s lexical entries to implicit QuDs (and the concept of covertness-induced QuD-ambiguity), made way for a more explanatory account of the observed pattern. Relatedly, it is worth mentioning that positing *exh* instead of *pex* would have made the entire enterprise of this paper more difficult, because *exh*, unlike *pex*, is expected to assert, not only its prejacent, but rather, the conjunction of its prejacent with SIs. So *pex*(p)'s assertion is fundamentally different from its prejacent's. It is therefore difficult to see how the QuDs evoked by *exh*(p) may be "closer" to those evoked by p than the QuDs evoked by *only*(p) would be. This difficulty constitutes an indirect argument for *pex* over *exh*: granted our approach, assuming the attested covert exhaustifier is, semantically speaking, the mirror image of *only*, makes the very covertness of this operator less mysterious.

This paper focused on showing inherent differences between *pex* and *(c)only* at the matrix level,

[18] Indeed, assuming that any utterance may evoke multiple QuDs, merging all the QuDs evoked by a prejacent p with those evoked by, say, *pex*(p), erases the derivational links that preexisted between a QuD for p and the QuD for *pex*(p) that was derived from it by accommodation/intersection. In that sense, our pooling of *all* the candidate QuDs in the same set before finding the matching cells between them erases potentially relevant information, taking the form of specific QuD-pairings.

demonstrating that, regardless of which exact set of implicit QuDs or which scalar structure was considered, *pex*'s covertness would either induce less QuD-ambiguity than *only*'s, or the degrees of QuD-ambiguity induced by these operators would be incomparable. However, a full generalization of our demonstration to complex embedded environments (potentially involving intricate presupposition projection patterns and multiple insertion sites for exhaustifiers like *pex* and *(c)only*) was only impressionistically sketched. Although this constitutes a fundamental gap in the argumentation, one can wonder if, more empirically, grammars evolved by attempting to optimize QuD-ambiguity on *all* utterances equally (including the rarest and most complex ones), or whether simple matrix utterances (that we covered extensively here) constitute the core benchmark for such grammars, at least when it comes to picking preferred covert operators.

Let us close this paper with our account's main typological prediction, which is that, if SIs–whether Neo-Gricean, or grammatical, materialized by *pex*–are present in every single language, no language should display a covert variant of *only* (*conly*). Moreover, if SIs are grammatical, some languages may display *pex*, some others, *opex*, and some languages may in fact display both simultaneously. The configuration that our approach would definitely exclude, is an *opex*/*conly* configuration. The exact inventory of exhaustifiers displayed by a language, given these constraints, is a function of the language's tolerance for ambiguity, and sensitivity to prolixity. This raises a number of questions: why do so many languages display *pex* instead of *opex* (along with *only*)? Is this dominant pattern solely due to cost-related considerations outweighing a need for disambiguation? Are there any other potentially overlooked advantages tied to covert (a hence optional) operators? Relatedly, what treatment should be assigned to more complex (and hence costly!) constructions sharing similarities with *pex*, e.g. clefts in English? Future typological work should determine what the actual, quantitative trends are in the domain of (c)overt exhaustifiers, and whether these trends can inform our model and predictions in any way. Lastly, if this approach is on the right track, it should be expected to apply to other sets of (c)overt operators with similar-enough semantics. A domain to explore may for instance be that of (bare) plurals.

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