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Mere-ology

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6.1 Introduction

At least 28 different lexical entries for the word *only* have been given in the literature.¹ This one little word has attracted so much attention presumably because it serves to illuminate a number of issues pertaining to the interplay between semantics and pragmatics: how focus affects interpretation, types of meaning (presupposition, implicature, etc.), how scalar implicatures are computed, and, of particular interest for this volume, the nature, origin, and role of alternatives in semantics.

The present work aims to shed new light on such issues by investigating exclusives other than *only*, such as *just*, *merely*, *solely*, *exclusively*, and the exclusive adjectives *sole*, *single*, *only*, and *mere*. We discuss here our findings regarding *mere* (but see Coppock and Beaver (2011a) for a somewhat broader view). Although many of the previous analyses of *only* have useful ingredients, none of them can be extended directly to *mere*. In a nutshell, what we need for this exclusive is a cross-categorical analysis on which the positive component is presupposed and the negative component is at-issue, and the positive and negative components are both scalar.

The latter two features are present already in Beaver and Clark's (2008) analysis of *only*; the main difference here concerns the fact that our analysis is cross-categorical, although, as we will show, it is far from trivial to determine the range of categories (or at least semantic types) of a particular exclusive. Specifically, we will argue that *mere* has two uses, one that modifies property-denoting expressions, and one that modifies

generalized quantifier-denoting expressions. We bring together these two uses under a single type-underspecified lexical entry schema, one which turns out to be usable for *only* as well. We offer this schema as a first step towards capturing the core meaning shared by all exclusives, with different instantiations of its abstract parameters yielding the wide range of exclusive meanings found in natural language.

One of the desiderata for a theory of exclusives is that it should capture the fact that (1) and (2) are equivalent:

- (1) She is a mere employee.
- (2) She is only an employee.

They both contribute a positive component (which according to our analysis is that she is *at least* an employee), and a negative component (which is expressible with *at most*, according to us).

Furthermore, as we will argue, there is an asymmetry between the positive and negative components of the meaning such that the negative component (the negation of the alternatives) is part of the primary semantic contribution, an *at-issue* part of the content in Potts's (2005) sense, while the positive part is typically presupposed to be true by the speaker. For *only*, the assumption that the positive component is presupposed has been standard since Horn (1969), and although it has been challenged (Atlas 1991, 1993, Horn 2002, Geurts and van der Sandt 2004, Ippolito 2006, van Rooij and Schulz 2007), we are convinced by Roberts (2006) and Beaver and Clark (2008) that the presuppositional analysis is right for *only* after all. Here, we argue that this is right for *mere* as well, using evidence from emotive factive predicates, reason constructions, and negation.

While arguing for a fundamental difference in status between the negative and positive components, we will also argue that the two components have an important property in common, namely that for both *mere* and (nonadjectival) *only*, the two components are *scalar*, rather than *quantificational*. Thus the negative component of *only P* says that nothing *stronger* than *P* on a contextually given scale of alternatives holds. Strength corresponds to entailment in cases like *I only invited Mary_F* but in cases like (1) and (2), it corresponds to a more general type of strength (perhaps *relevance*, as van Rooij (2002) and van Rooij and Schulz (2007) argue).² On purely quantificational analyses such as that of Horn (1969), in contrast, *only P* means that none of the alternatives to *P* (regardless of strength) is true. The scalarity issue becomes crucial when it comes to *mere*; one can get away with ignoring scalar

readings of *only* but scalar readings are the only kind of readings that *mere* has.

A unique feature of the Beaver and Clark analysis of *only* is that the *positive* component of *mere* (and *only*) is scalar too, and this is essential for our analysis. In particular, we take the positive component of the meaning to be the proposition that something *at least as strong* as the prejacent holds, where strength is contextually determined. Thus a speaker uttering either (1) or (2) presupposes that something at least as strong as the proposition that she is an employee holds. This allows us to explain the fact that the prejacent (the proposition that the sentence would express if the exclusive were removed) does not follow as an inference from the negation of sentences like (1) and (2). This is a fact we would not be able to explain using the standard assumption that the positive component is the prejacent (Horn 1969).

Thus, two of the necessary ingredients for an analysis of *mere* – asymmetry and scalarity – are present in Beaver and Clark's (2008) analysis of *only*. In order to give a satisfactory analysis of *mere*, however, their lexical entry must be parameterized. Beaver and Clark (2008) analyze both NP-modifying *only* and VP-modifying *only* as sentence operators. This works well enough for *only*, but *mere* cannot be analyzed as a sentence operator, as we see when it modifies an argumental noun phrase (as opposed to a predicative one, as in (1)). Examples (3) and (4) mean quite different things:

- (3) The mere thought of him sends shivers down my spine.
- (4) Only the thought of him sends shivers down my spine.

While (4) suggests that his presence or touch would certainly also have the ability to send shivers down the spine, (3), somewhat implausibly, implies that such things would not have that effect.

This difference in interpretation corresponds to a contrast in the ability to license negative polarity items. In general, subject-modifying *only* licenses NPIs in the VP but *mere*, apart from an interesting class of exceptions which we will describe shortly, does not.

- (5) Only a smile from him would make any difference.
- (6) *A mere smile from him would make any difference.

The presence of the NPI *any* in the VP is responsible for the ungrammaticality of (6); if it were replaced by, for example, the indefinite article *a*, the example would become grammatical. Our explanation for these facts

is based on scope: *only* takes sentential scope, whereas *mere* takes scope only over the noun it modifies.

But there is a twist (the class of exceptions alluded to above): although subject-modifying *mere* generally does not license negative polarity items in the VP, there are some cases in which it does, including the following web example:

- (7) Of all these children and teens struggling with emotional and behavioral problems, a mere 30% receive any sort of intervention or treatment.

In section 6.6, we account for such cases by proposing that in addition to being able to modify properties, *mere* can also modify generalized quantifiers, which take the property denoted by the VP as an argument. When it does so, *mere* takes scope over the entire sentence.

This leads us to a cross-categorical lexical entry for *mere* that accounts for both its property-modifying use and its generalized quantifier-modifying use. Interestingly, our proposed lexical semantics for *mere* can also be extended to *only*, which suggests that it may be a step towards a completely general statement of the semantics of exclusives, with differences arising through restrictions on certain abstract parameters.

6.2 Similarities between *mere* and *only*

A desideratum for any account of *mere* is that it should not be too different from the account of *only*, because there are contexts in which they are interchangeable, modulo syntactic differences, namely, in predicative sentences. Both (1) and (2), for example, imply that the female referent in question is (at least) an employee (this is the positive component of the meaning), and no more than an employee (this is the negative component). Those examples are based on the following web example, which shows that the presence of *mere* can have legal consequences:

- (8) The trial court had held that Hunt did not owe any such duty because he was a mere employee and not a corporate officer or the 'policy-making equivalent' of an officer.

Employees are corporate officers, but to say that someone is a *mere employee* or *only an employee* is to imply that they are an employee and no more than an employee, thus, not a corporate officer. Thus both *mere*

and *only* make a truth-conditional impact, and the impact is the same here. In other words, both *mere* and *only* have a positive component and a negative component in their meaning.

Another similarity between *mere* and *only* is that the positive component of the meaning is presupposed, while the negative component is at-issue. Evidence for this comes from several sources, including emotive factive verbs, reason clauses, and negation.

Adding to the arguments for an asymmetry between the positive and negative components that had been made by Horn (1969), Beaver and Clark (2008) use emotive factive verbs to show that the negative component in the meaning of *only* is presupposed, pointing to examples like (9):

- (9) I am disappointed that only 3 billion dollars will be paid against the approximately 480 billion dollar federal debt.

What is disappointing to the speaker in (9) is not that at least 3 billion dollars were paid – that much is good – but rather that no more than those 3 billion were paid; in other words, the negative component, and not the positive component, is targeted by the emotive factive verb. The same can be said about the corresponding sentence with *mere*:

- (10) I am disappointed that a mere 3 billion dollars will be paid against the approximately 480 billion dollar federal debt.

Assuming that what emotive factive verbs target is at-issue content, this shows that the negative component, and not the positive component, is at-issue.

Reason clauses are another environment that distinguishes between presupposed and at-issue content (Dretske 1972). Beaver and Clark (2008) give the following example:

- (11) And aides and allies were instructed not to characterize Thursday's vote as a victory or a defeat, even though many viewed it as a partial win, because only 31 Democrats voted for Hyde's resolution.

Here, the reason that the vote should not be characterized as a victory or a defeat is not that at least 31 Democrats voted for the resolution – those votes are reasons to characterize the event as a victory – but rather that no more than the 31 Democrats did so. The same interpretation arises with *mere*:

- (12) And aides and allies were instructed not to characterize Thursday's vote as a victory or a defeat, even though many viewed it as a partial win, because a mere 31 Democrats voted for Hyde's resolution.

Here is an attested example of this phenomenon with *mere*:

- (13) Northwest was not liable because it was a mere conduit for another's infringing conduct.

The fact that Northwest was a conduit for another's infringing conduct is not what frees it from liability; *au contraire*, if anything that should make it more liable. The reason that it is *not* liable is that it was *no more* than a conduit for another's infringing conduct, and did not actually engage in such conduct per se. Assuming that reason clauses target at-issue content, these contrasts show that the negative component is at-issue while the positive component is not, and that this is so for both *mere* and *only*.

Finally, if the positive component is presupposed, then it should survive under negation. This it does, but we will defer this point until after we have discussed in more depth what the positive component actually is. By that point, we will have reviewed evidence from emotive factives, reason clauses, and negation that the positive component is presupposed while the negative component is at-issue.

The second important feature of our analysis of both *mere* and *only* is scalarity. Beaver and Clark's analysis is the most scalar of the previous analyses of *only*, because both the positive and the negative components are given a scalar treatment: The negative component says that nothing stronger than the prejacent holds, and the positive component says that something at least as strong as the prejacent holds. But it has been recognized in some other works on *only* that the negative component must be scalar. Consider the following example from Bonomi and Casalegno (1993: 42, ex. (88):

- (14) [Mary asks Peter, 'Have you seen the headmaster?' and Peter says:]
No, only [the assistant]_F received me.

As Bonomi and Casalegno point out, this can mean that the assistant headmaster was the most important person who received Peter (for example, the secretary might also have been there). Another example of this kind is from van Rooij (2002: 156). The context is a card game in which each player gets three cards, and the winner is the one with

the highest card. The king of diamonds is higher than the jack of hearts. Player A shows Player B the king of diamonds and Player B says:

(15) I only have the jack of hearts.

This does not mean that Player B has no other cards; it means that the jack of hearts is the highest card he has. These examples are not compatible with theories according to which the negative component quantifies over all entities in the domain, regardless of rank; this would imply that the player has no other cards. These examples also counterexample theories on which only stronger answers are ruled out, if strength is determined by entailment; 'I have the jack of hearts and the ten of spades' entails 'I have the jack of hearts,' and the former is not ruled out by the sentence. In Horn's (2000, 2009) terminology, *only* makes use of a *rank-order* scale in this case, as opposed to an entailment scale.

If the positive component is scalar as well, as argued by Beaver and Clark for *only* – saying that something at least as strong as the prejacent holds – and it is presupposed, as argued above for both *mere* and *only*, then a negated predicative sentence should imply that something strictly stronger than the prejacent holds. This prediction is borne out:

(16) The court determined that Green was not a mere conspirator, but an organizer of the conspiracy.

Suppose that the positive inference in the first clause in (16) is that Green was at least a conspirator, and the negative component is that he was at most a conspirator. The negative component is at-issue, so it is targeted by the negation in the first clause, to give: Green was strictly more than a conspirator, and this is what (16) means. In (16), that proposition is entailed by the second clause. Crucially, however, even when the second clause is removed, as in (17), it is still implied that Green was strictly more than a conspirator (i.e. that he was high up in the sinister, conspiratorial hierarchy). This holds for both *mere* and *only*:

(17) Green wasn't {a mere, only a} conspirator.

This shows that the positive component is scalar, like the negative component. It also shows that the positive component is not targeted by embedding operators like negations, thereby providing additional support for the claim that in general the positive component of the meaning of *mere* is presupposed, just as it is with *only*.

If the positive and negative components are both scalar, then the negation of a simple exclusive sentence is predicted not to entail the prejacent in contexts where stronger answers do not entail weaker answers. The positive component ('at least [prejacent]') together with the negation of the negative component ('not at most [prejacent]') imply that some answer that is stronger than the prejacent is true. If the stronger answers do not entail the weaker answers, then the prejacent will not follow. In support of this prediction for *only*, Beaver and Clark (2008) give the following example:³

(18) This isn't only a pointless 'shoot-em-up' movie.

This sentence does not imply that the movie in question is a pointless shoot-em-up movie.⁴ On the contrary, it implies the negation of the prejacent:⁵ it is *not* a pointless shoot-em-up movie. The same consequence follows if *only* is replaced by *mere*:

(19) This isn't a mere pointless 'shoot-em-up' movie.

This is easily explained under the assumption that *mere*, like *only*, has a scalar presupposition to the effect that something at least as strong as the prejacent holds. It is not possible to explain this under the standard assumption that (the positive component is presupposed and) what is presupposed is the prejacent.

Note, incidentally, that it is not always the case that for scalar readings of *only* and with *mere*, the negation of the prejacent follows under negation. The status of the prejacent depends on the logical relationship between the elements of the scale. Consider for example a negated version of (1), or the corresponding version with *only*:

(20) She isn't {a mere, only an} employee.

In a context like that of (8), this could imply that she is a corporate officer, for example, which would be a type of employee. In this case, the stronger alternative entails the prejacent, and so the prejacent follows as an inference.

6.3 Beaver and Clark's theory (approximately)

Beaver and Clark's (2008) theory of exclusives captures both scalar and nonscalar readings, and accounts for the occasional disappearance of

the prejacent under negation. According to Beaver and Clark (2008), the positive contribution of *only* is expressed by the formula $\text{MIN}(\phi)$, and the negative contribution by $\text{MAX}(\phi)$, where ϕ is the prejacent. The positive contribution (MIN) is presupposed and the negative contribution (MAX) is part of the ordinary at-issue content. The MAX and MIN operators relate to the current Question under Discussion (CQ; Roberts 1996),⁶ which contains a set of alternative propositional answers, ranked by strength; $\text{MIN}(\phi)$ means that ϕ is a lower bound on the true answers to the CQ; $\text{MAX}(\phi)$ means that ϕ is an upper bound on them. We use the following formalization of MIN and MAX , where the subscript S represents an information state and \geq represents the strength ranking, and p is a variable over propositions (functions from possible worlds to truth values), and w is a variable over worlds:⁷

- (21) $\text{MAX}_S(p) = \lambda w. \forall p' \in \text{CQ}_S [p'(w) \rightarrow p \geq_S p']$
 (22) $\text{MIN}_S(p) = \lambda w. \exists p' \in \text{CQ}_S [p'(w) \wedge p' \geq_S p]$

Using the Heim and Kratzer notation for presuppositions, the meaning of *only* can then be captured by the following expression:⁸

- (23) $\text{ONLY}_S = \lambda p. \lambda w: \text{MIN}_S(p)(w) . \text{MAX}_S(p)(w)$

The value of CQ is constrained by the alternative set corresponding to the prejacent. This is how Beaver and Clark explain it (p. 262):

The meaning of a sentence with an exclusive depends essentially on the CQ. But not just any CQ will do, for two reasons. First the CQ must satisfy the congruence condition from the Focus Principle (2.54), which ensures that the focus marking in an utterance is appropriate for the question that the utterance helps answer . . . Second, the CQ must obey the additional constraint imposed by the presupposition of the exclusive, placing a lower bound on the strength of the alternatives that are still open.

The Focus Principle is as follows:

(24) Focus Principle

Some part of a declarative utterance should evoke a set of alternatives containing all the Rooth–Hamblin alternatives of the CQ.

The Rooth–Hamblin alternatives are answers that, unlike Groenendijk and Stokhof's (1984) answers, but like Hamblin's (1971) alternatives,

do not partition the answer space, and like Rooth’s alternatives (Rooth 1992), are full propositions rather than fragments. For example, the meaning of the question ‘Who does Sandy feed Nutrapup?’ includes: Sandy feeds Nutrapup to Fido, Sandy feeds Nutrapup to Clifford, Sandy feeds Nutrapup to Fido and Clifford, etc.

Every expression α has an alternative semantic value α^A ; an expression ‘evokes’ a set of alternatives by having it as its alternative semantic value. The alternative set for an unfocused atomic constituent is the singleton set containing the intension of that constituent. But if a constituent is focused, then the alternative set will be a set of objects that have the same type as the intension of the focused constituent. Alternative semantic values are computed recursively in the standard way (essentially as in Rooth 1985). The Focus Principle says that the CQ must be equal to or be a subset of the alternative semantic value of some part of the utterance. This amounts to something quite similar to the Focus Interpretation Principle of Rooth (1992), and in fact the direct reference to the CQ in the lexical entries for *only* and *mere* is not crucial to the present analysis.

Both scalar and nonscalar readings are analyzed using scales in this framework. What makes nonscalar readings ‘nonscalar’ is just the nature of the scale (so we might do better by calling them ‘quantificational’ readings instead). Nonscalar readings involve a ranking of the answers in the CQ as a Boolean lattice corresponding to the sum operation over individuals, as depicted in Figure 6.1.

Each node in the lattice stands for an answer. (Only names appear on the nodes, but the answers are to be understood as propositional; *I invited Mike and Frank*, *I invited Mike*, etc.) In the context of a CQ ranked this way, (25) receives a ‘nonscalar’ reading:

(25) I only invited John and Mike.

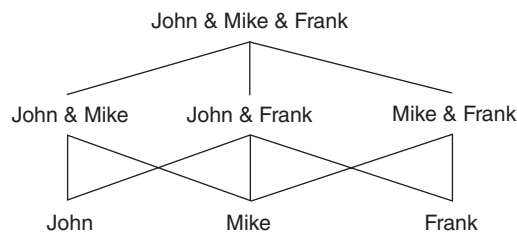


Figure 6.1 A CQ for a quantificational reading

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The presupposition (MIN) is that there is an answer at least as strong as the prejacent. The answers at least as strong as the prejacent include the prejacent itself ('John and Mike') and the stronger answer 'John & Mike & Frank'. The assertion (MAX) is that the prejacent is an upper bound on the true answers, which rules out the stronger answer. So the sentence is correctly predicted to imply that John and Mike were invited, and nobody other than John and Mike was invited.

The MIN presupposition gets more of the spotlight when negation enters the picture:

(26) I didn't only invite John and Mike.

This negated version also implies that at least John and Mike were invited, leaving 'John & Mike' and 'John & Mike & Frank'. To negate the sentence is to negate the MAX proposition, viz. that 'John & Mike' is an upper bound on the true answers. Together MIN and the negation of MAX imply that something stronger than the prejacent holds. In this case, the only stronger answer is 'John & Mike & Frank'. This means that John and Mike were invited, but someone else was as well. This would be Frank, if there are no others to choose from.

Crucially, the same technology can be applied to account for scalar readings, as in (18), repeated here:

(27) This is(n't) only a pointless 'shoot-em-up' movie.

In a nondefective context, the answers in the CQ will all attribute properties to the movie in question, and the ranking will be one of artistic merit. The proposition that the movie is utter trash is a weaker answer than the prejacent, and the proposition that the movie has clever dialogue is a stronger answer, as depicted in Figure 6.2.

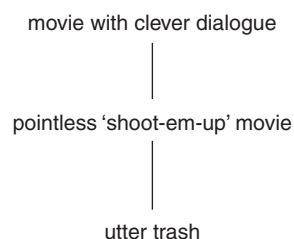


Figure 6.2 A CQ ranked by artistic merit

The MIN presupposition of (27) is that there is a true answer to the question of how good the movie is that is at least as strong as the prejacent. When the exclusive is embedded under negation, the MAX assertion is the negation of the negative component of the exclusive meaning, i.e. the negation of the proposition that the movie is no better than a pointless shoot-em-up movie. So the movie *is* better than a pointless shoot-em-up movie. If the CQ were as in Figure 6.2, this would imply that the movie has clever dialogue. Beaver and Clark's theory correctly predicts that the prejacent does not survive as an inference under negation in this case.⁹

When we replace scalar *only* by *mere*, we get exactly the same interpretations:

- (28) This is a mere pointless 'shoot-em-up' movie.
- (29) This isn't a mere pointless 'shoot-em-up' movie.

In particular, (29) implies that the movie lies higher on the scale of artistic merit than a pointless shoot-em-up movie, because it is presupposed that the movie is at least as high as a pointless shoot-em-up movie on the scale of artistic merit, and the asserted content, negated in (29), is that it is no higher on that scale.

At this point, we might be tempted to analyze *mere* in the same way that Beaver and Clark analyze *only*, as a sentence operator that presupposes that MIN holds of the sentence and asserts MAX (and requires focus on the noun it modifies). But this will only work so long as we limit our attention to predicate nominal-modifying cases of *mere*. In cases involving argumental nouns, *mere* and *only* behave quite differently, as we will see in the next section.

6.4 Property-modifying *mere*

Differences between *mere* and *only* emerge in nonpredicative cases. Consider the contrast between (30) and (31):

- (30) The mere thought of him sends shivers down my spine.
- (31) Only the thought of him sends shivers down my spine.

While (30) strongly suggests that things other than the thought of the man in question would send shivers down the spine of the speaker – his presence, for example, or, heaven forbid, his touch – (31) does not have the same implication. What (31) conveys is the somewhat implausible

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proposition that it is really only the thought that bothers the speaker; for some reason, his presence and his touch do not really bother her. Related, *only* licenses NPIs in the VP when modifying a subject, and *mere* usually does not:

- (32) Only a smile from him would make any difference.
- (33) *A mere smile from him would make any difference.

We propose to account for both of these contrasts based on scope. Schematically:

DET mere N \Leftrightarrow DET x such that x is only an N

We can illustrate how this works using a simple episodic example from one of Aesop's fables. A gnat challenges a lion to a fight and kills him, and then becomes fatally entangled in a spider's web. As he is being devoured, he wails:

- (34) I, who defeated the strongest of all creatures, am destroyed by a mere spider!

The representation that we want to derive for this example is the following, where, crucially, ONLY scopes over the proposition that x , which is existentially bound, is a spider:

(35) $\lambda w. \exists x [\text{DESTROYED}(x)(g)(w) \wedge \text{ONLY}(\text{SPIDER}(x))(w)]$

In natural language, (35) reads: 'There is a thing x such that x destroyed g (the gnat) and x is only a spider.'

An example of the kind of CQ this involves is depicted in Figure 6.3.

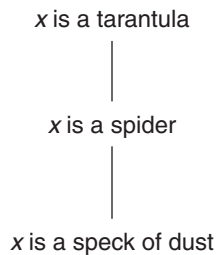


Figure 6.3 Scalar alternatives with an unbound variable

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Notice that these alternatives contain an unbound variable, x . The need for open propositions among the alternative set also becomes evident when one considers uses of *only* inside relative clauses:

(36) I've never met a man who only eats beans.

Here the alternatives need to be of the form ' x eats beans', ' x eats rice', ' x eats carrots', etc., with x unbound. This suggests that there must be Current Questions that are local to the restrictor of the quantifier, which cannot be explicitly uttered. See Coppock and Beaver (2011b) for a formal treatment using a kind of dynamic semantics in which contexts contain not only information but also questions.

Now we need a lexical entry for property-modifying *mere* from which we can derive the representation in (35) for (34). Our proposed lexical entry is as follows:

(37) **Denotation of property-modifying *mere***

$$\lambda P_{(e,p)}. \lambda x_e . \text{ONLY}_S(P(x))$$

This is the intension of a function that takes two arguments, and applies one to the other to produce a proposition of which it is presupposed that MIN holds and asserted that MAX holds, namely, the proposition that the entity x has the property P . In our example, x corresponds to the destroying entity, and P to the property of being a spider.

The full derivation of the asserted content works as follows (glossing over a number of unimportant details):

$$[[\text{the gnat}]] = G$$

$$[[\text{destroyed}]] = \lambda y . \lambda x . \lambda w . \text{DESTROYED}(y)(x)(w)$$

$$[[\text{destroyed the gnat}]] = \lambda x . \lambda w . \text{DESTROYED}(G)(x)(w)$$

$$[[\text{spider}]] = \lambda x . \lambda w . \text{SPIDER}(x)(w)$$

$$[[\text{mere}]] = \lambda P \in D_{(e,p)} . \lambda x . \text{ONLY}(P(x))$$

$$[[\text{mere spider}]] = \lambda x . \text{ONLY}(\text{SPIDER}(x))$$

$$[[a]] = \lambda F \in D_{(e,p)} . \lambda G \in D_{(e,p)} . \lambda w . \exists x [F(x)(w) \wedge G(x)(w)]$$

$$[[a \text{ mere spider}]] = \lambda G \in D_{(e,p)} . \lambda w . \exists x [\text{ONLY}(\text{SPIDER}(x))(w) \wedge G(x)(w)]$$

So $[[a \text{ mere spider destroyed the gnat}]] = \lambda w . \exists x [\text{ONLY}(\text{SPIDER}(x))(w) \wedge \text{DESTROYED}(G)(x)(w)]$.

The lexical entry we have given also helps to explain the contrast between (30) and (31), repeated here:

- (38) The mere thought of him sends shivers down my spine.
 (39) Only the thought of him sends shivers down my spine.

The asserted content of (38) will look very roughly like the following, translating *the* with ι (even though this is not a typical definite noun phrase) and glossing over many other details:

- (40) SHIVERS(ιx . MAX(THOUGHT(x)))

The asserted content of (39) will look more like this:

- (41) MAX(SHIVERS(ιx . THOUGHT(x)))

For (38), the CQ is required to contain the proposition that x has the property denoted by the noun (*thought of him*). Since this is not an answer to the sentence-level question ('What sends shivers down my spine?'), it is impossible for *mere* to be construed as answering that question in this context. This explains why (38) does not assert that nothing other than the thought of him would do the trick, unlike (39).

At the same time, this lexical entry captures the interparaphrasability between *mere* and *only* in predicative sentences like *it is(n't) {only a, a mere} pointless shoot-em-up movie*. If we assume that the copula and the indefinite article are semantically vacuous, then the proposition of which MIN is presupposed and MAX is asserted will be the attribution of the property (e.g. *pointless shoot-em-up movie*) to the subject in both cases. This lexical entry also accounts for the contrast in NPI licensing between *only* and *mere*. We explain how in the next section.

6.5 NPI licensing

Recall examples (5) and (6), repeated as (42) and (43), showing that subject-modifying *only* licenses NPIs in the VP, while subject-modifying *mere* does not:¹⁰

- (42) Only a smile from him would make any difference.
 (43) *A mere smile from him would make any difference.

This can be explained on the grounds that exclusives only license NPIs in the MAX/MIN environment, and *only* places the entire sentence in

this environment, while *mere* takes scope only over the nominal that it modifies.

For concreteness, let us assume, following von Stechow (1999), that Strawson Downward Entailingness, defined as follows, is what is relevant for NPI licensing.

(44) **Strawson Downward Entailingness**

A function f of type $\langle \sigma, \tau \rangle$ is Strawson-DE iff for all x, y of type σ such that $x \Rightarrow y$ and $f(x)$ is defined: $f(y) \Rightarrow f(x)$.

The entailment operator is defined cross-categorially:

(45) **Cross-categorial entailment** (\Rightarrow)

For p, q of type $t: p \Rightarrow q$ iff $p = \text{False}$ or $q = \text{True}$.

For f, g of type $\langle \sigma, \tau \rangle: f \Rightarrow g$ iff for all x of type $\sigma: f(x) \Rightarrow g(x)$.

Intuitively, the way this works with *only* is as follows. *Only John ate vegetables* entails *Only John ate kale* (kale being a special type of vegetable) under the assumption that the presuppositions of both sentences are satisfied. In this case, the presupposition of the latter sentence is that someone ate kale. If someone ate kale, and only John ate vegetables, then John ate kale, and John was the only one who did so.

Under the present assumptions, the presuppositions of exclusives are MIN statements and the assertions are MAX statements. Von Stechow demonstrates that *only* is Strawson-DE under a more simplistic analysis of *only* than the one we are using here, so in order to explain the contrast in NPI licensing between *mere* and *only*, we must first show that *only* is Strawson-DE under the MAX/MIN analysis. To check whether *Only John ate vegetables* Strawson-entails *Only John ate kale* under our assumptions, we need to check the following argument:

1. kale \Rightarrow vegetables
 2. MIN(John ate kale)
 3. MAX (John ate vegetables)
- Therefore, John ate kale.

Expanded, these MIN and MAX statements will refer to distinct CQs:

1. kale
2. There is an alternative in CQ_1 that is at least as strong as 'John ate kale'.

3. No true alternative in CQ_2 that is at least as strong as 'John ate vegetables'.

Therefore, no true alternative in CQ_1 is stronger than 'John ate kale'.

CQ_1 is 'Who ate kale?' and CQ_2 is 'Who ate vegetables?' The second premise can be paraphrased, 'any true answer to the question of who ate kale includes John'. The third premise can be paraphrased, 'no true answer to the question of who ate vegetables corresponds to a group containing John as well as others'. The conclusion makes an analogous claim about who ate kale. Does the conclusion follow, given that kale is a type of vegetable? Suppose it were not true; people other than John ate kale. Then there would be people other than John who ate vegetables, contradicting our third premise. So the argument is valid. This shows that *only* is Strawson-DE on the MAX/MIN analysis, as is *mere*.

This predicts that *only* should be able to license NPIs in its scope. Under the assumption that *only* is a sentence-level operator, the VP is correctly predicted to be able to contain NPIs, as in (42). The reason that the NPI in (43) is not licensed is that *mere* does not take scope over the VP.

To summarize, the lexical entry in (37) thus ensures that *mere* takes scope over the nominal it modifies and nowhere else. This allows us to account for the contrast in meaning between (3) and (4), and the contrast between *mere* and *only* in their ability to license NPIs; while both license NPIs in their scope, *mere*'s scope is restricted to the noun phrase it modifies, and therefore it cannot license NPIs in the VP when it modifies the subject.

6.6 Generalized quantifier-modifying *mere*

Now for the twist: There *are* cases in which *mere* actually does license NPIs in the VP:

- (46) *(A **mere**) **three people** gave me **any** feedback.
 (47) Of all these children and teens struggling with emotional and behavioral problems, a **mere 30%** receive **any** sort of intervention or treatment.
 (48) A **mere 4%** listed it **at all**.
 (49) At present a **mere minority** of the Chinese overseas have **any** living memory of the ancestral land.

Given our current analysis, this should not happen.

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We suggest that what *mere* is modifying in cases like (46) is a generalized quantifier, which takes the VP as an argument. Suppose that *three* denotes a quantifier of type $\langle ep, \langle ep, p \rangle \rangle$:

$$(50) \text{ [[three]]} = \lambda F \in D_{\langle e, p \rangle} . \lambda G \in D_{\langle e, p \rangle} . \lambda w . |\{x | F(x)(w) \wedge G(x)(w)\}| \geq 3$$

So the function denoted by *mere* in this case takes the generalized quantifier *three people* (type $\langle ep, p \rangle$) as an argument. Recall our previous lexical entry for *mere* in (37), which was a function that takes a property and an individual, and presupposes MIN and asserts MAX about the proposition that the property holds of the individual. The one for generalized quantifier-modifying *mere* will also take two arguments, but the first argument in this case is a generalized quantifier, and the second argument is a property, which will be fed as an argument to the generalized quantifier to produce a proposition about which MIN can be presupposed and MAX can be asserted. The lexical entry is:

$$(51) \text{ Denotation of quantifier-modifying } \textit{mere} \\ \lambda Q_{\langle \langle e, p \rangle, p \rangle} . \lambda P_{\langle e, p \rangle} \text{ ONLY}_S(Q(P))$$

In our example, *three people* corresponds to Q , and *gave any feedback* corresponds to P . So the denotation of *mere three people* is:

$$(52) \lambda P_{\langle e, p \rangle} . \text{ ONLY}_S(\lambda w . |\{x | \text{PERSON}(x)(w) \wedge P(x)(w)\}| \geq 3)$$

For *a mere three people*, we assume that the indefinite article denotes an identity function, which gives us the denotation in (52) for *a mere three people* as well. Applying this to $\text{[[give any feedback]]} = \text{FEEDBACK}$, we have the following asserted content:

$$(53) \text{ ONLY}_S(\lambda w . |\{x | \text{PERSON}(x)(w) \wedge \text{FEEDBACK}(x)(w)\}| \geq 3)$$

Crucially, the VP is now in the scope of MAX/MIN, and negative polarity items are correctly predicted to be licensed.

6.7 Synthesis and conclusion

In order to unify the two separate lexical entries for *mere* in (37) and (51), we propose the following single, cross-categorial lexical entry that can be instantiated in different ways to produce the two entries. In general, it takes one argument of type $\langle \sigma, p \rangle$ and another argument of type σ , and applies the former to the latter.

(54) Denotation schema for *mere* (and *only*!)

$$\lambda F_{\langle\sigma,p\rangle} \cdot \lambda A_{\sigma} \cdot \text{ONLY}_S(F(A))$$

The property-modifying lexical entry for *mere* represents the case where $\sigma = e$, and the generalized quantifier-modifying lexical entry represents the case where $\sigma = \langle e, p \rangle$.

The lexical entry in (54) can be extended to produce a sentence-operator analysis of *only*, as in for example Beaver and Clark (2008), if we can set σ to \emptyset and stipulate that $\langle\sigma, \tau\rangle = \tau$, and prune the λ term for the argument of type \emptyset . But it is worth considering other ways of extending (54) to give an analysis of *only*. As a VP-modifying adverb, *only* takes scope only over the VP, so for this use of *only*, it might be most appropriate if σ is set to e , just like property-modifying *mere*. For the NP-modifying *only* that appears in (46), the most promising analysis seems to us to be to treat the NP as a generalized quantifier, and instantiate σ as $\langle e, p \rangle$, in order to capture the fact that NP-modifying *only* licenses NPIs in its scope.¹¹ Considering the full range of uses of *only* from this perspective is beyond the scope of the present chapter, but we hope to have shown that *mere* opens up a new perspective on its more famous cousin.

A typology of exclusives is beginning to emerge. We conjecture that what exclusives have in common are MIN and MAX, where MIN is presupposed and MAX is asserted. Exclusives may then vary in how they instantiate the type parameter σ in the general entry (54) (as well as their syntactic properties). For property noun-modifying *mere*, $\sigma = e$, and because this takes the property denoted by the noun it modifies as an argument, they have NP-internal scope. *Only* has VP- or sentence-level scope; we have suggested that for VP-modifying *only*, $\sigma = e$, and for NP-modifying *only*, $\sigma = \langle e, p \rangle$. *Mere* can also have sentence-level scope, when it modifies a generalized quantifier; in that case $\sigma = \langle e, p \rangle$. Perhaps exclusives in other languages will reveal further instantiations of σ .

Coppock and Beaver (2011a) argue for an additional parameter, namely the *structure of the alternatives*, as implemented by presuppositional constraints on the contents of the CQ. *Mere* requires the alternatives to differ with respect to the property, and adjectival *only*, for example, requires the alternatives to differ with respect to the individual to which the property is ascribed. The presupposed vs at-issue status of the MIN component may be another parameter along which exclusives can vary; Orenstein and Greenberg (2010) argue that Hebrew *stam* asserts both MIN and MAX. Still more parameters may emerge, as the range of exclusives is explored further. Together with the data we have

described in this chapter, such observations suggest that even though it will be imperative in future work to constrain the typology of exclusives sufficiently so as to determine a linguistically meaningful class, we are still sure to be left with a lexical field that is rich in its variation.

We hope to have shown that a careful consideration of *mere* and *only* can teach us some general lessons about the nature of alternatives in semantics. Analysis of these exclusives indicates, for example, that alternatives can potentially contain an unbound variable. This, especially combined with the fact that exclusives impose presuppositional constraints on the salient set of alternatives, motivates a novel dynamic semantics, as argued and implemented in Coppock and Beaver (2011b). In that system, the dynamically updated contexts contain both information about variables, and information about questions that can be free in those variables. A second general lesson that has emerged through consideration of exclusives is that alternatives can be ranked, and not necessarily by entailment. It would be worthwhile to consider the extent to which nonentailment rankings (*rank orders*, in Horn's (2000, 2009) terminology) are applicable to other phenomena involving, or theorized to involve, alternatives, such as other focus particles, conversational implicatures, free choice items, scalar adverbs such as *almost*, and superlative quantifiers such as *at least* and *at most*.¹² Might all of these diverse uses of alternatives potentially involve nonentailment scales?

Notes

1. Horn (1969), Karttunen and Peters (1979), Jacobs (1983), Taglicht (1984), Rooth (1985), Atlas (1991, 1993), von Stechow (1991), Krifka (1992), Krifka (1993), Bonomi and Casalegno (1993), Rooth (1992), Horn (1996), Jäger (1996), Schwarzschild (1997), von Fintel (1997), Herburger (2000), van Rooij (2002), Geurts and van der Sandt (2004), Klinedinst (2005), Fox (2006), Giannakidou (2006), Ippolito (2006), van Rooij and Schulz (2007), Beaver and Clark (2008), Chierchia, Fox and Spector (2008), Horn (2011), and Zeevat (to appear).
2. This idea is embodied in the proposals of van Rooij (2002), Klinedinst (2005), van Rooij and Schulz (2007), and Beaver and Clark (2008), and was suggested briefly by Bonomi and Casalegno (1993), Herburger (2000), and Beaver (2004). It is also prefigured to a smaller extent by analyses according to which the exclusive component of *only* rules out only stronger alternatives, and strength corresponds to entailment (Rooth 1992, Krifka 1992, 1993, von Fintel 1997, Chierchia 2006, Fox 2006).
3. Horn (2000, 2009) argues that such examples are possible with *just*, but not *only*, citing contrasts like the following: *She isn't just/??only an assistant_i professor, she's a full_i professor*. We agree that there is a contrast between *just* and

only here, and suspect that *only* may in fact presuppose the prejacent at least for some speakers. This does not negate the point that the alternatives are not necessarily ranked by entailment; it just requires us to scrutinize the non-negated cases more carefully and upon such scrutiny it can still be seen that the scale is not necessarily ranked by entailment. In any case, *mere* behaves as expected under the assumption that the positive component is scalar. Furthermore, the fact that *just* behaves this way as well supports our general point that a MAX assertion and a MIN presupposition constitute the core meaning of an exclusive; *only* appears to impose additional requirements.

4. As a reviewer suggests, one might wonder whether this is an example of implicature cancellation. The best developed models in which prejacent inferences are analyzed as implicatures are those of van Rooij and Schulz (2003, 2007) and Ippolito (2006). In these models (20) would imply that the cinematic masterpiece in question was a pointless shoot-em-up movie, contra to fact. In Ippolito's model, this result obtains because of the way she combines (conditionalized) presuppositions and implicatures. For van Rooij and Schulz, the effect results from their analysis of prejacent inferences as what they term 'strong implicatures', inferences which cannot be directly canceled, although they can be questioned. We are not aware of any existing implicature-based analysis of prejacent inferences which would get the facts right for (21), while still explaining the various other puzzling inferences which dog the literature on exclusives.
5. There is also a nonscalar/exhaustive reading of (18), one which could be true of the Tarantino movie *Pulp Fiction*: It is a pointless shoot-em-up movie, but it is also a work of art, paradoxically.
6. We use 'CQ' rather than 'QUD' in order to make it clear that we are referring only to the single most burning question rather than the entire stack of them. Note also that the term 'QUD' was used in a different sense by Ginzburg (1996), as part of a theory of questions based on situation semantics.
7. On Beaver and Clark's definition of MIN, which is slightly different from the one in (3), answers lower ranked than the prejacent are required to be *false*, which means that the prejacent cannot be true when it entails lower-ranked answers. We do not want to commit to the assumption that the prejacent is always the lowest ranked of the answers; the present formulation requires instead that something in the CQ at least as strong as p holds.
8. Note that here the presupposed content involving MIN constrains the discourse context, and specifically the CQ. However, the colon/dot notation is normally used to express presuppositions that are conditions that must hold in the world. A formal account of how questions can be presupposed that works with exclusives is given in Coppock and Beaver (2011b).
9. The astute reader may wonder what happens in case the prejacent is tied with another answer that is logically unrelated to the prejacent, for example in a card game with two equally ranking cards. We must say something more to ensure that the prejacent follows as an inference in such a case. One possible solution is to rule out such cases by stipulating an algebraic constraint on the ordering preventing ties, i.e. cases where $a \geq b$ and $b \geq a$ and $a \neq b$ (which would not prevent a and b from being unrelated entirely). Another possible solution is to replace $\text{MAX}(p)$ with $\text{MAX}(p) \wedge p$ in the asserted content of an

exclusive. Note that this would not affect our ability to account for the fact that the prejacent does not always follow as an inference under negation because the negation would scope over the conjunction. We thank Michael Wagner, Michael Franke, and an anonymous reviewer for discussion of this issue.

10. *Mere* does not license NPIs in the noun it modifies: **He is a mere author of any children's books*. We believe that this is related to the fact that *only* doesn't license NPIs in its focus (see e.g. Beaver and Clark 2002 and Wagner 2005).
11. See von Stechow (1997, Appendix B) for interesting discussion of this option.
12. Krifka (1999) argues that rank orders are involved in the interpretation of superlative quantifiers, citing examples such as *He is at least an assistant professor*, and he develops a compositional mechanism for deriving ranked alternative semantic values there. In future work we hope to explore connections between this approach and the CQ-based approach of Beaver and Clark (2008).

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