Journal of Semantics, 31, 2014: 371–432
doi:10.1093/jos/fft007
Advance Access publication August 11, 2013

Principles of the Exclusive Muddle

ELIZABETH COPPOCK
University of Gothenburg

DAVID I. BEAVER
The University of Texas at Austin

Abstract

This paper provides a lexical entry schema for exclusives covering the adverbs *only*, *just*, *exclusively*, *merely*, *purely*, *solely*, *simply*, and the adjectives *only*, *sole*, *pure*, *exclusive* and *alone*. We argue, on the basis of inter-paraphrasability relations among these exclusives and entailments involving *at least* and *at most*, that all of these items make an at-issue contribution of an upper bound on the viable answers to the current question under discussion (expressible with *at most*), and signal that a lower bound on those answers (expressible with *at least*) is taken for granted. The lexical entry schema accommodates two main points of variation, which makes it possible to capture the differences in meaning among these terms: (i) semantic type (restricted to the class of modifiers), and (ii) constraints on the current question under discussion or the strength ranking over its alternative possible answers. We propose 22 different specific instantiations of the schema for exclusives in English.

1 INTRODUCTION

The words *only*, *just*, *exclusively*, *merely*, *purely*, *solely*, *simply*, *sole*, *pure exclusive*, and *alone* are members of a unified class—the class of *exclusives*—in a sense that this paper makes precise. The most famous representative of this class is adverbial *only*, for which at least 27 distinct lexical entries have been given.[1] This paper situates *only* in the context of its lexical relatives in English, accounting for a number of equivalences and non-equivalences between sentences involving *only* and ones involving other exclusives. We propose that what unifies the words mentioned above is that they concern an upper bound on the viable answers to the

[1] Horn (1969); Karttunen & Peters (1979); Jacobs (1983); Taglicht (1984); Rooth (1985); Atlas (1991, 1993); von Stechow (1991); Krifka (1992, 1993); Rooth (1992); Bonomi and Casalegno (1993); Horn (1996); Jäger (1996); Schwarzschild (1997); von Fintel (1997); Herburger (2000); van Rooij (2002); Geurts & van der Sandt (2004); Klinedinst (2005); Fox (2006); Giannakidou (2006); Ippolito (2006); van Rooij & Schulz (2007); Beaver & Clark (2008); Chierchia *et al.* (2008); Horn (2011).

current question under discussion, and signal that a lower bound on them is taken for granted. These two criteria are encapsulated in a lexical entry schema for exclusives, which accommodates two main points of variation: semantic type (within the class of modifiers), and constraints on the current question under discussion. We propose 22 different specific instantiations of the schema for the exclusives listed above.

Semantic equivalence and paraphrasability relations between sentences involving different exclusives show that their meanings are related, and are among the data we seek to explain. For example, the following sentences can all be used to express the same idea:

(1) a. This is **only** for fun.
b. This is **just** for fun.
c. This is **merely** for fun.
d. This is **simply** for fun.
e. This is **exclusively** for fun.
f. This is **solely** for fun.
g. The **sole** purpose of this is fun.
h. The **only** purpose of this is fun.
i. The **exclusive** purpose of this is fun.
j. This is for fun **alone**.

It is well-known that the exclusive *only* has two meaning components, a positive one and a negative one. The positive component of an *only* sentence like (1a) is standardly taken to be what is known as the *prejacent*, which is the result of removing the exclusive from the sentence, yielding (2) in this case.

(2) This is for fun.

The prejacent is implied (presupposed, as we will discuss in Section 2.2) by all of the examples in (1). The negative component, which is part of the ordinary at-issue content,[2] can be paraphrased with *nothing other than* in this case:

(3) This is for **nothing other than** fun.

The examples in (1) all imply (3).

[2] We use 'at-issue' to describe what is asserted in an assertion, asked in a question, demanded in a command, etc. Presuppositions (although they are not alone in this) are not at-issue. See Roberts *et al.* (2009); Simons *et al.* (2010) for further discussion of these distinctions.

Not all exclusives can be used to express the idea in (1). This idea cannot be expressed in an obvious way using the adjectival exclusive *mere*. However, sentences with *mere*, e.g. (4a), do have paraphrases with the exclusives *only*, *just* and *merely*:

(4) a. This is a **mere** down payment.
b. This is **only** a down payment.
c. This is **just** a down payment.
d. This is **merely** a down payment.

In these cases, the negative component can be expressed with *no more than* in place of the exclusive:

(5) This is **no more than** a down payment.

The negative component would not be expressible with *nothing other than* in this case:

(6) ?This is **nothing other than** a down payment.

The adverbial exclusives in (4)—*only*, *just*, and *merely*, but not *mere*—have marginal additional readings that can be paraphrased with other exclusives:

(7) a. ?This is **exclusively** a down payment.
b. ?This is **purely** a down payment.
c. ?This is **solely** a down payment.

Unlike (4a), the examples in (7) entail the *nothing other than* sentence (6). We label the readings that give rise to *nothing other than* entailments as *complement exclusion* readings (Hole 2004), because they exclude everything in the complement of the set of things described by the focus (the property of being a down payment, in this case). The idea expressed unambiguously in (4a) is an example of what we will refer to as a *rank-order* reading (Horn 2000), because it concerns the placement of the prejacent on a scale that orders elements by rank. In the case of rank-order readings, the negative component can be paraphrased with *no more than* and not *nothing other than*.

The positive component, too, needs to be expressed differently when it comes to rank-order readings. The examples in (4) imply the prejacent (*This is a down payment*), but under negation, the prejacent does not survive as an inference. For example, (8) does not imply that the sum in question is a down payment.[3]

[3] As a reviewer points out, the variant of (8) with heavy emphasis on *just* has a reading that can be paraphrased, 'Yes, this is a down payment, but this is other things as well.' To place heavy emphasis on *just* would indicate that negation should target the information conveyed by the exclusive, but there is information conveyed by other parts of the sentence that the speaker

(8) This isn't {**just** a, a **mere**} down payment.

However, there is a presupposed positive component in these cases as well, and it can be expressed with *at least*.

(9) This is **at least** a down payment.

In other words, the positive component is, 'this is a down payment or something higher on the contextually relevant scale'. Both the positive sentences in (4) and their negative variants in (8) imply this. It is the *at least* sentence, rather than the prejacent, which captures the positive component under rank-order readings.

We aim to give a uniform analysis for complement-exclusion and rank-order readings, and to do so, we advocate a uniformly *scalar* analysis of exclusives, according to which the positive component is always expressible with *at least* and the negative component is always expressible with *no more than* or *at most*. Following Beaver and Clark (2008), we assume that the answers to the CQ are ranked by 'strength', and that *only* presupposes that the prejacent is the weakest of the viable answers to the CQ, and contributes an ordinary at-issue entailment that the prejacent is the strongest of the viable answers. The difference between complement-exclusion readings and rank-order readings lies in the nature of the scale.

A further fact to be explained in this paper is that when *mere* occurs in an argumental noun phrase, it can be paraphrased with *just* and *merely*, but resists being paraphrased with *only*, and cannot be paraphrased with *exclusively* or any of the other exclusives that allow only complement exclusion readings.

(10) a. The **mere** thought of food makes me hungry.
b. **Just** the thought of food makes me hungry.
c. **Merely** the thought of food makes me hungry.
d. **Simply** the thought of food makes me hungry.
e. ?**Only** the thought of food makes me hungry.
f. #**Exclusively** the thought of food makes me hungry.
g. #**Purely** the thought of food makes me hungry.
h. #**Solely** the thought of food makes me hungry.

The examples marked as pragmatically infelicitous can only be interpreted as implying that *nothing other than* the thought of food makes the

wishes to commit to. On a complement exclusion reading, the prejacent is available as a proposition that the speaker can commit to while negating the at-issue content of the exclusive.

speaker hungry, and this is odd, given that smells and pictures of food would seem to be more likely inducements for hunger. The odd reading is a complement exclusion reading. What (10a) means is: 'Something/Anything that is *no more than* the thought of food makes me hungry.' The available reading can be labelled a 'minimal sufficiency reading', following Grosz (2012). As suggested by the paraphrase, under minimal sufficiency readings, the scope of the exclusive is, we argue, limited within the noun phrase. To account for the contrasts in (10), we make use of a semantic type parameter in the lexical entry schema, giving items like *mere* local scope.

We will argue that adjectival exclusives all have the same type, but they are not all interchangeable. Compare, for example, (10a) with (11a) or (11b):

(11) a. The **sole** thought of food makes me hungry.
b. The **only** thought of food makes me hungry.

(10a) is so different in meaning from (11a) and (11b) that it hardly makes sense to compare them. For another example, while *exclusive* is roughly synonymous with *only* and *sole* in (1), it is not always interchangeable with them:

(12) a. Nima Elbagir has an **exclusive** phone interview with Safia Gadhafi.
b. Nima Elbagir has a **sole** phone interview with Safia Gadhafi.
c. *Nima Elbagir has an **only** phone interview with Safia Gadhafi.

Examples (12a) and (12b) have different truth conditions; the former implies that nobody else has a phone interview with Safia Gadhafi and does not rule out the possibility that Nima Elbagir has multiple interviews with her, and the latter does not rule out the possibility that anyone else has a phone interview with her and implies that Ms. Elbagir has only one. In order to account for this contrast, we argue that adjectival exclusives differ with respect to the kind of question they answer.

The grammaticality contrast between (12b) and (12c), illustrating the fact that *sole* allows an indefinite determiner and *only* does not, bespeaks a meaning difference between *only* and *sole*. We propose that *sole* allows a broader range of interpretations than *only*, and includes the meaning of *only* as a special case. This contrast is also explained using constraints on the question under discussion.

To preview the conclusion we will reach, we will argue that all exclusives are modifiers, functions of type $\langle\tau,\tau\rangle$. When τ is $\langle e,p\rangle$, the result is a property-modifier, $\langle\langle e,p\rangle,\langle e,p\rangle\rangle$. (We use p as a shorthand for $\langle s,t\rangle$, the type of propositions, i.e., functions from worlds to truth values.) This works for VP-*only* and adjectival exclusives. When τ is $\langle\langle e,p\rangle,p\rangle$, the result is a modifier of quantifiers, $\langle\langle\langle e,p\rangle,p\rangle,\langle\langle e,p\rangle, p\rangle\rangle$. This works for NP-*only* and uses of *mere* that modify quantifiers. We will argue that *sole* and *exclusive* instantiate τ as $\langle e,\langle e,p\rangle\rangle$. Thus one of the parameters along which exclusives differ is the semantic type of what they modify. We refer to this as the *type parameter*.

The first argument to an exclusive will always have a type ending in p, and the subsequent argument(s) will be such that they can be fed in sequence to the first argument to form a proposition. That proposition is the prejacent. Let us use π to refer to the prejacent. We will argue that all exclusives have two meaning components in common:

1. MIN(π): There is some answer to the current question under discussion that is at least as strong as the prejacent (the 'at least' component).
2. MAX(π): There is no answer to the current question under discussion that is stronger than the prejacent (the 'at most' component).

The 'at least' component is presupposed, and the 'at most' component is at issue. This is the essence of exclusivity.

But to characterize the full range of exclusives, it is necessary to accommodate two additional points of variation. Besides the type parameter, another way in which exclusives may differ from each other is the constraints that they place on the current question under discussion. This is the *question parameter* (discussed in Section 4). Adjectival exclusives have the same type ($\langle\langle e,p\rangle,\langle e,p\rangle\rangle$), but they answer different questions. In, for example, *This is the only offer*, the question that adjectival *only* relates to is 'Which entities are offers?' (answer: only this one). In *This is a mere offer*, the question that *mere* relates to is 'What properties does this have?' (answer: It is only an offer). In *This is an exclusive offer*, the question that *exclusive* relates to is 'What entities possess this?' (answer: only the indicated possessor).

Exclusives may also differ with respect to the constraints they place on the strength ranking over the answers to the current question under discussion; this is the *strength ranking parameter*. For example, the fact that *This is exclusively a down payment* is a strange thing to utter can be captured by saying the *exclusively* requires the strength ranking to

correspond to logical entailment. We will discuss the different ways in which exclusives instantiate the strength parameter as we go through them in Section 4.

2 THE COMMON CORE: MAX AND MIN

Before addressing the differences between exclusives, let us establish their common core of meaning. Recall that *only* sentences have a positive component and a negative component. In a sentence like (13), the positive component is roughly that the speaker invited John, and the negative component is roughly that the speaker invited nobody else, or nobody more exciting or noteworthy.

(13) I **only** invited John_{F}.

Two types of answers—*scalar* and *non-scalar*—have been given to the question of what the relevant meaning components are in general. According to the traditional analysis of *only* (Horn 1969), the positive component is the prejacent, and the negative component excludes alternatives to the focus; for (13) it can be paraphrased *I invited nothing/nobody other than John*. This a non-scalar analysis, as it makes no reference to scales; others in this category include Groenendijk & Stokhof (1984, p. 296); Rooth (1985, 1992); and Krifka (1992), among many others.

Scalar analyses (Krifka 1993; Bonomi and Casalegno 1993; van Rooij 2002; Beaver 2004; Klinedinst 2005; Riester 2006; Beaver and Clark 2008) make reference to a scalar ordering over some set of alternatives.[4] According to such analyses, *only* rules out alternatives that are ranked higher than the prejacent on the scale. Intuitively, the negative contribution of *only* can be paraphrased with *at most*. For example, in (13), the negative component is *I invited at most John*. (The 'negative' character of this can be brought out by the slightly less natural alternative paraphrase *I invited no more than John*.) On Beaver and Clark's (2008) scalar analysis, the positive component is also scalar;[5] it can be paraphrased with *at least*. For example, in (13), the positive component can be expressed as *I invited at least John*. The ranking corresponds to entailment in

[4] This idea 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 1993; von Fintel 1997; Chierchia 2006; Fox 2006).

[5] In unpublished work, Klinedinst (2004, 2005) espouses a scalar analysis of the positive component as well.

cases like (13) but crucially, it may also correspond to other orderings (perhaps *relevance*, as van Rooij (2002); van Rooij and Schulz (2007) argue).

We will argue in Section 2.1, building on Coppock and Beaver (2013) and Coppock and Beaver (2011), that the scalar analysis is more general in that it ties together rank-order and complement exclusion readings of *only*, and can be extended to handle other exclusives, most notably *mere* and *just*. The result is what we claim to be the common core of meaning for all exclusives.

In Section 2.1, we take for granted that the positive component is presupposed, and the negative component is part of the at-issue meaning, but this assumption will be justified in Section 2.2, after we have established our claims regarding the nature of these components.

2.1 *In favor of a scalar analysis*

2.1.1 *Complement exclusion and rank-order readings* One of the main advantages of the scalar type of account is that it provides a unified treatment of complement exclusion and rank-order readings.

The most salient reading of a sentence like (14) is of the 'complement exclusion' type:

(14) Mary **only/just** invited John and Mike.
  a. → Mary invited **nobody other than** John and Mike.
  b. → Mary invited **at most** John and Mike.

This is a 'complement exclusion' reading in the sense that the complement of the set {John, Mike} is excluded from the party (from the property of being invited, more precisely). Hence in the complement exclusion case, the negative, at-issue component can be paraphrased with *nobody other than*, as in (14a). This example also expresses an upper bound on the set of people who were invited, and hence it also implies a sentence with *at most*, as in (14b).

Predicative sentences like (15) provide a good source of rank-order readings:

(15) John is **only/just** a graduate student.
  a. ↛ John is **nothing other than** a graduate student.
  b. → John is **at most** a graduate student.

(15) does not imply that John has no (relevant) properties other than being a graduate student; it says that John has no (relevant) properties that are ranked *higher* than the property of being a graduate student.

Thus in the rank-order case, while the *at most* sentence in (15b) follows, while the corresponding sentence with *nothing other than* in (15a) does not.

Both prejacent and *at least* inferences follow from positive exclusive sentences of both types.

(16) Mary invited **only/just** John and Mike.
  a. → Mary invited John and Mike.
  b. → Mary invited **at least** John and Mike.

(17) John is **just/only** a graduate student.[6]
  a. → John is a graduate student.
  b. → John is **at least** a graduate student.

But under negation, complement exclusion and rank order readings behave differently. Although the prejacent is not reliably implied by the negation of a rank-order exclusive predication, the *at least* sentence is, as Beaver and Clark (2008) discuss. For a negated exclusive sentence, the *at least* sentence is entailed both in complement-exclusion cases like (18b) and in rank-order cases like (19b), and the prejacent is entailed in cases of complement-exclusion readings as in (18a), but not in cases of rank-order readings such as (19a):

(18) Mary didn't invite **only/just** John and Mike.
  a. → Mary invited John and Mike.
  b. → Mary invited **at least** John and Mike.

(19) John isn't **just/%only** a graduate student.
  a. ↛ John is a graduate student.
  b. → John is **at least** a graduate student.

John isn't just a graduate student does not mean that John is a graduate student and something else; it means that John is at least as high on the academic scale as 'graduate student', and 'graduate student' is not the upper bound. Thus *at least* captures the positive component of the meaning, under both rank-order and complement exclusion readings, while the prejacent is only implied in the complement exclusion case.

As indicated by the use of the % symbol above, it is clear that *only* does not allow rank-order readings under negation as easily as *just*. There are certainly attested examples of rank-order readings with *only*

[6] The % indicates variation in the availability of rank-order readings for *only*. Such readings are robustly available for *just* and *merely*.

under negation. An example of this type that Beaver and Clark (2008) discuss is:

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

Example (20) does not imply that the movie is a pointless 'shoot-em-up' movie; in other words, the prejacent is not entailed. But based on our own searches, naturally-occurring examples like (20), where a negation outscopes *only* and where there is no inference to the truth of the prejacent, are much rarer than examples with complement exclusion readings. Indeed, it has been claimed that examples like (20) are ungrammatical: Horn (2009) argues that such examples are possible with *just*, but not *only*, citing contrasts like the following:

(21) We're not **just**/??**only** engaged, we're married!

We agree that there is a contrast between *just* and *only* here, and it seems that some property of *only* discourages rank-order readings, most clearly under negation. Discourages, but doesn't rule out, at least for many speakers: a Google search for `"aren't only engaged" married` yields many examples of the relevant sort, e.g.:

(22) So it looks like these two aren't **only** engaged, but they may have already had a dreamy miliblonde wedding. We can't confirm this info 100% just yet. But if we ever get our hands on a marriage license... you'll be the first to know. Until then, we've got our eye on you Dream & Miliblonde.
(*ONTD Livejournal 07/08/2009*)

Furthermore, it seems possible to get rank-order readings of *only* in yes/no questions, as Klinedinst (2005) observed:

(23) Is Sam **only** a [detective inspector]? (Grosz 2012, p. 248, ex. (601a))
(24) BP has stopped the oil from flowing—But is it **only** temporary?

The facts concerning the availability of rank-order readings for *only* in embedded contexts are deserving of further investigation. Nevertheless, the fact that examples like (15) cannot be paraphrased with *nothing other than* shows that *only* allows rank-order readings, so a theory of *only* should allow for this flexibility.

Independently of the extent to which rank-order readings are available for *only*, they are needed for *just* and *merely*, which have clear rank-order readings in both positive and negated contexts. In the variant of (21) with *just*, for example, the speaker presumably does not wish to imply that the individuals in question are engaged,

so the prejacent does not follow. Rather, what is expressed is that they are *more than* engaged. Furthermore, as Beaver and Clark (2008, p. 236) point out, *merely* also has negated rank-order uses:

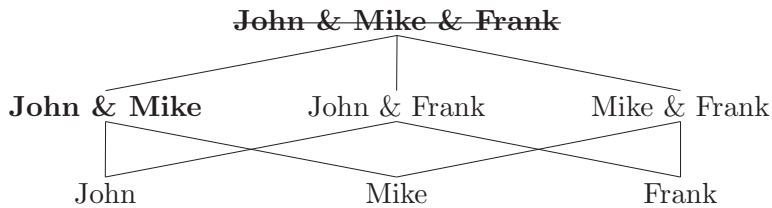
(25) I was in Paris in 1947, trying to convince Trotskyists they should believe that Russia isn't **merely** a 'degenerated workers' state', it's a state-capitalist society.

(26) The registered office address must be a street address, and not **merely** a post office box.

We assume that a state-capitalist society is incompatible with being a degenerated workers' state, and clearly no street address is a post office box. Thus, to the extent that *only* disallows rank-order readings under negation, it is exceptional among exclusives in this respect. Thus any such restriction should not be part of a general typology of exclusive meaning, but rather should be explained through some as-yet-undetermined combination of lexically specific and pragmatically derived properties of *only*.

The complement-exclusion readings of *only* as in (14) can be obtained in the scalar framework by ranking the alternative answers as a boolean lattice so that, for example, answers like 'Mary invited John and Mike and Frank' are stronger than answers like 'Mary invited John and Mike'. Under that type of ranking, what is presupposed is that something as strong as or stronger than 'Mary invited John and Mike' holds. This can be expressed with *at least*: 'Mary invited at least John and Mike'. In (27), boldface marks answers that are circumscribed by the 'at least' condition.

(27)



Each answer corresponds to a node, and the arrangement of the nodes corresponds to the strength ranking. (The node labels are just shorthand; the answers are full propositions, like *Mary invited John*, *Mary invited Mike*, etc.)

The at-issue content according to Beaver and Clark's analysis is that no answer stronger than the prejacent is true; this can be expressed with *at most*: 'Mary invited at most John and Mike'. This means, for example, that 'Mary invited John and Mike and Frank' is ruled out. In Figure (27), the answers that are ruled out by the 'at most' component are struck out.

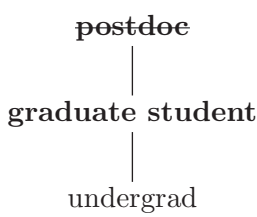
Now consider a negated complement exclusion reading. Again, under the Beaver and Clark analysis, the positive component of *only*'s contribution in (14) is 'Mary invited at least John and Mike', and this is presupposed. This presupposition is correctly predicted to survive negation, as in (28).

(28) Mary didn't **only** invite John and Mike.

Since the 'at least' component remains in force under negation, it is still required that one of the boldfaced answers holds. But now the at-issue content rules out the prejacent, requiring that one of the stronger answers holds. This means that someone other than John and Mike was invited as well. (In our example, this would have to be Frank.) With this type of scale, because the higher-ranked alternatives entail the lower-ranked alternatives, the prejacent follows as an inference even under negation.

Of course, a scalar analysis naturally captures rank-order readings, on which the scale does not correspond to a boolean lattice of individuals but rather a rank-ordering (as Horn (2000, 2009), describes it). (29) illustrates how the scalar analysis works for (15). As in the previous example, the bold-faced answers are the ones corresponding to the 'at least' component and the struck-out answer is the one ruled out by the 'at most' component.

(29)



Under negation, the presupposition of *only* survives and the at-issue content is negated.

(30) John isn't **just/only** a graduate student.

This example implies that one of the bold-faced answers in (29) holds, and that furthermore, it must be one of the bold-faced answers that is ranked higher than the prejacent (of which only one is depicted in (29), namely 'postdoc'). Since the higher-ranked answers do not entail the lower-ranked answers in this case, it is not predicted that the prejacent will follow as an inference. Hence the disappearance of the prejacent in rank-order cases is correctly predicted by the assumption that the positive component is scalar. Furthermore, it is not predicted that the sentence should be paraphrasable as *John is nothing other than a graduate student*.

Again, under a non-scalar analysis of *only*, the negative component can be expressed with *nobody other than* or *nothing other than*. This analysis does not extend to rank-order uses of *only*. As discussed earlier, *John is only a graduate student* does not imply that John is nothing other than a graduate student. A proponent of a non-scalar analysis might retort by bringing up domain restriction, and suggest that the only relevant properties in this context are academic ranks. But the same kind of domain restriction appears not to be available so as to provide a reasonable interpretation of the following examples:

(31) ??John is **nothing other than** a graduate student.
(32) ??The **only** thing that John is is a graduate student.

Certainly, *nothing* is subject to domain restriction. *I need nothing other than your signature at this point* does not mean that that the speaker does not need air to breathe. The fact that (31) and (32) do not have the same interpretation as corresponding examples with *only* suggests that domains cannot be restricted to rank-order scales. Thus, without a scalar analysis, the contrast between (15) and (31)/(32) is mysterious.

Non-scalar analyses also falsely predict that the prejacent will survive as an inference under negation. Such analyses differ as to the content of the positive component. On some it is the prejacent (entailed according to Atlas (1991, 1996), presupposed according to Horn (1969), Rooth (1985), Krifka (1993) and Roberts (2006), entailed but assertorically inert according to Horn (2002, 2011) and von Fintel (1997), and implicated according to McCawley (1981, 226–7) and van Rooij & Schulz (2003)). On others it is an existential proposition, with with focus replaced by an existential quantifier (Horn 1996; Wagner 2005; Geurts & van der Sandt 2004). According to Ippolito (2006) it is a (conversationally implicated) conditional statement of the form 'existential → prejacent'. Some of the non-scalar theories that treat the positive component as a claim that is weaker than the prejacent fail to predict the inference to the prejacent in simple complement exclusion cases like *Only Mary smokes* or *Not only Mary smokes*, but all of the above-mentioned theories that do manage to capture this fact predict that the prejacent follows in rank-order cases as well.[7]

[7] A reviewer suggests that examples like (20) could be explained under the following non-scalar analysis: '*only* presupposes that one of the alternatives to the prejacent is true and moreover asserts that all alternatives not entailed by the prejacent must be false'. A negated rank-order case like (20) would then entail that some alternative to the prejacent (distinct from the prejacent) holds, whether it is higher or lower on any scale. This comes closer than a traditional non-scalar analysis but still does not quite work, because it predicts that (20) allows for the possibility that the movie is utter trash.

2.1.2 *mere: Exclusively rank-order* When it comes to *mere*, scalarity becomes a crucial feature of the analysis, because *mere* has only rank order readings, and does not yield complement exclusion readings. But it is very much like *only*, expressing 'at most' and presupposing 'at least'. It is not always possible to detect a truth-conditional effect for *mere* (a mere child is a child; a child is a mere child), but there are cases where a truth-conditional (and legal, and financial) effect can be observed. Consider the following example.[8]

(33) The Australian Competition and Consumer Commission (ACCC) commenced proceedings against Google and the Trading Post in November 2007 alleging that Google's placement of sponsored advertisements falsely represented an affiliation or association with the advertiser's competitor by appearing in response to a user search enquiry for the competitor. **At trial, Nicholas J held that Google was a 'mere conduit' for the advertiser's misleading or deceptive representations**. The ACCC appealed, arguing that Google made the misleading and deceptive representations as a result of their direct involvement in the selection and publishing of advertisements in response to user search enquiries.

Google and the ACCC would presumably agree that Google was a conduit for the deception; the legal question is whether it was a *mere* conduit. To say that Google is a mere conduit is to imply that it is a conduit and *at most* or *no more than* a conduit, hence not responsible for the deception. It is the presence of *mere* in (33) that generates the negative implication. (34) shows that being a conduit is consistent with being higher up on the scale, being, for example, responsible for the deception.

(34) Google was a conduit for the deception, and in fact, it was much more than that; it was directly responsible for it.

Being a *mere conduit* is, in contrast, not:

(35) #Google was a **mere** conduit for the deception, and in fact, it was much more than that; it was directly responsible for it.

So *mere* gives rise to truth conditional effects, which can be expressed using *no more than*:

(36) Google is a **mere** conduit → Google is **no more than** a conduit.

[8] *Google more than a 'mere conduit': ACCC v. Google inc.*, by Joanne Tassone & Jennifer King, 20 April 2012.

Notice that the same inference follows from a rank-order use of *only*, *just*, or *merely*. This inference cannot be expressed using *nothing other than*:

(37) Google is a **mere** conduit ↛ Google is **nothing other than** a conduit.

So a scalar analysis captures the negative component of *mere*, and a non-scalar analysis does not.

2.1.3 *Minimal sufficiency readings* Another case where scalar readings manifest themselves is in what Grosz (2012) labels 'minimal sufficiency readings'.

(38) **Just** the thought of food made me hungry.
(39) #**Only** the thought of food made me hungry.

Example (38) has two readings. The minimal sufficiency reading, which we view as a rank-order reading, can be paraphrased, *Something that is no more than the thought of food made me hungry*, or *The thought of food was sufficient to make me hungry*. On the *complement exclusion* reading, *nothing other than* the thought of food made the speaker hungry; in this sense, the reading in question excludes the complement of the focus. The complement exclusion reading of (38) is the most prominent reading of (39) (despite being the least plausible). For a general theory of exclusives, we need to be able to account for the minimal sufficiency reading of *just* in (38), and a scalar analysis can do that, as we will show in detail in Section 3.2.3.

A scalar analysis can also account for the complement-exclusion reading. (39) implies, *At most the thought of food made me hungry*. (In general, anything that can be paraphrased with *nothing/nobody other than* can be paraphrased with *at most*, but not vice versa.) Thus a scalar analysis can capture both readings of (38), but a non-scalar analysis can only capture the complement exclusion one.

2.1.4 *Summary* In Section 2.1, we have argued in favor of a scalar analysis of exclusives on the grounds that it can be extended to account for *mere* and rank-order readings of *only* and *just*, including minimal sufficiency readings, while a non-scalar analysis cannot. In Section 2.3, we give a precise formulation of the scalar analysis, and in Section 3 we will consider an even wider range of exclusives. But first, in Section 2.2, we will provide evidence for *only* as well as other exclusives that the positive component is presupposed while the negative component is part of the at-issue content.

2.2 *Status of the positive component*

In Section 2.2.1, we will review the arguments that have been made in previous literature that the positive component of *only* is presupposed, and in the subsequent sections, we will consider other exclusives.

2.2.1 *only* We maintain the traditional position that the positive component of the meaning of *only* is presupposed. An obvious prediction of this claim is that the positive component projects across negation. As pointed out by Horn (1969), when NP-modifying *only* is preceded by *not*, the prejacent (which follows from the positive component in this example under any analysis) survives as an inference as predicted.

(40) Not **only** Mary smokes. → Mary smokes.

While (40) implies the negation of the negative universal component, the positive component (that Mary smokes) survives.

Additional evidence for the non-at-issue status of the positive component comes from reinforcement (Beaver and Clark 2008, p. 217). An *only* sentence can be used to reinforce the positive component, but not the negative component, showing that the negative component is at-issue in the *only* sentence but the positive component is not.

(41) a. (At least) Mary smokes, and indeed **only** Mary smokes.
b. #Nobody but Mary smokes, and indeed **only** Mary smokes.

Beaver and Clark (2008) also use emotive factive verbs to show that the positive component—which they take to be 'at least [prejacent]'—is presupposed, pointing to examples like (42).

(42) 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 (42) is not that at least three billion dollars were paid—that much is good—but rather that no more than those three billion were paid; in other words, the negative component, and not the positive component, is targeted by the emotive factive verb.

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

(43) 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 vote as a victory—but rather that no more than the 31 Democrats did so.

Further evidence for an asymmetry between the positive and negative components comes from the following statement that applicants for Yale University parking permits were required to affirm (Horn 2011):

(44) I also agree that **only** one of my vehicles will be parked in any Yale University lot at any one time.

As Horn (2011, 210) points out, this 'was not likely interpreted as committing the recipient of the sticker to stationing a car in a Yale lot at all times'. If the positive component were part of the at-issue content of *only*, then such a commitment would be incurred by the statement.

The evidence we have considered so far establishes a difference in status between the positive and negative components, but it does not rule out the possibility that the positive component is a conventional implicature in Potts's (2005) sense. However, like presuppositions, and unlike conventional implicatures (Potts 2005), the positive component can easily be locally satisfied by the antecedent of a conditional, in which case it fails to project:

(45) If Mary loves Fred, then she loves **only** Fred.

This example does not imply that Mary loves Fred, and this can be understood under the assumption that the prejacent is a presupposition, because in general, presuppositions in the consequent of a conditional do not project across conditionals whose antecedent entails the content of the presupposition (Karttunen 1973, 1974; Heim 1983; van der Sandt 1992).[9]

The presuppositional analysis of the positive component predicts that it cannot be felicitously cancelled. In normal cases, this prediction is borne out (Beaver & Clark 2008: p. 226):

(46) #**Only** Superman can save us now, and even he can't.

[9] Compare (45) to the following: *If Mary refused to talk to John, then she loves* ***only*** *Fred*. On a natural reading of this variant, the proposition that Mary loves Fred projects.

However, as discussed by Ippolito (2006) and van Rooij & Schulz (2007), there are cases in which the inference can be cancelled:

(47) **Only** Arnold Schwarzenegger can save us now, but he's busy working for – you guessed it—The Government. We are therefore doomed.

The positive component in this case is that Arnold Schwarzenegger can save us now, but the continuation seems to imply that he cannot because he is too busy. Presuppositions are not normally thought to be cancellable, even under modals (cf. Beaver and Clark 2008: p. 227)). But Horn (1970, 2011) points out that normal presuppositions can be suspended with the appropriate modal hedges, as long as the suspension moves the claim 'in the direction of greater universality'.[10] In (47), the claim amounts to a quantified statement of the form '*X* cannot save us now', and becomes more general the more values of *X* there are for which it holds true. When this criterion is satisfied, we can even find vanilla presuppositions being cancelled:

(48) Mary didn't stop smoking, and maybe she never smoked in the first place.

Here the claim is of the form ''Mary didn't smoke at time *t*,'' and becomes more general the more values of *t* there are which make it true. Hence, the suspendability of *only*'s positive component illustrated in (47) does not constitute evidence against the notion that it is presupposed.

Horn (2002, 2011) argues that the positive component is entailed but 'assertorically inert'. This crucially implies that (49) is false if the speaker does not love the addressee.

(49) I love **only** you.

In other words, the idea that the prejacent is entailed means that (49) is a 'declaration of love', and the addressee is licensed to accuse the speaker of lying if the speaker does not love the addressee. But this intuition is compatible with what would be expected under many theories of presupposition. Under most modern theories of presupposition (from Gazdar 1979 on), presuppositions are typically entailed, and while few such theories have made explicit commitments as to how people judge truth and falsity, it is the case that on some accounts (e.g. Gazdar's), absent love, the sentence would be false. In other terms, that the prejacent is presupposed, and not asserted when the clause with the

[10] Roberts (2006) also gives arguments supporting this conclusion; Beaver & Clark (2008) make a corresponding claim in terms of 'letting the hearer down gently'.

exclusive is uttered as part of an assertive speech act, is compatible with the prejacent being part of the ordinary content from which entailments are derived.

Taking into consideration all of the evidence reviewed in this section, we conclude that the positive component is in fact presupposed. It projects across negation, it is reinforceable, it is not targeted by emotive factive predicates, reason clauses, or promises, it can be bound in the antecedent of a conditional, and it is not cancellable. Although arguments have been made in favor of alternative analyses based on cancellability under modals, and misleadingness intuitions under falsehood of the prejacent, we maintain that this evidence is consistent with the traditional presuppositional analysis.[11]

2.2.2 *mere* An 'at least' inference follows from both the positive and the negative variants of the following sentence, showing that this inference results from a presupposition:

(50) Google was a **mere** conduit → Google was **at least** a conduit.
(51) Google was not a **mere** conduit → Google was **at least** a conduit.

The 'at least' presupposition, together with the negation of the 'at most' at-issue component ('Google was not at most a conduit'), generates the implication that Google is in trouble.

Further evidence for the at-issue status of the negative component and the non-at-issue status of the positive component for *mere* comes from emotive factive verbs and reason clauses. Recall (42). The same can be said about the corresponding sentence with *mere*. Here is an attested example of this phenomenon with *mere* (Coppock & Beaver 2013):

(52) 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

[11] See Roberts 2006 for a defense of a related but distinct position. She argues that the prejacent 'is closer to a presupposition than to an entailment or a conversational implicature, but ... may best be characterized as a non-speaker-oriented conventional implicature'. None of the explanations we will give below of the complex facts concerning different exclusives will hinge on whether the positive component of exclusive meaning is presupposed or a 'non-speaker-oriented conventional implicature', or, indeed, some other type of non-at-issue meaning with similar properties as regards cancellation and projection.

at-issue while the positive component is not, and that this is so for both *mere* and *only*. So: In predicative sentences, *mere* gives rise to 'at least' and 'at most' inferences, with the former being presupposed, similarly to *only* and *just* on their rank-order uses.[12]

2.2.3 *only/sole* The adjectival exclusives *sole* and *only* also give rise to *at least* and *at most* entailments. For example, (53) implies (54) and (55).[13]

(53) He is the **sole** proprietor.
(54) **At least** $[\text{he}]_F$ is a proprietor.
(55) **At most** $[\text{he}]_F$ is a proprietor.

Complicating the picture, (53) has two distinct readings. What we term the *predicative* reading can be paraphrased 'Only he is a proprietor'; the other reading, which we call the *equative* reading, can be paraphrased 'He is the same person as the sole proprietor'. On the equative reading, the entire definite description is presupposed, as one would expect of a definite. So it is presupposed that there is an identifiable individual x such that at least and at most x is the proprietor, and it is at-issue that 'he' is identical to x.

On the predicative reading, we see more typical exclusive behavior, insofar as (54) is presupposed and (55) is at-issue. To see this, consider (56), the negation of (53). On its predicative reading, (54) follows but (55) does not.

(56) He is **not** the **sole** proprietor.

Note that (56) gives rise to a puzzle about the meaning of the definite article; if there is no *sole proprietor*, as the sentence asserts, then the existence implication normally associated with the definite article is absent here. Coppock & Beaver (2012b,d) address this problem by proposing that the definite article in predicative position does not give rise to an existence implication, only a uniqueness implication.

Our observations regarding (53) can be repeated with adjectival *only* in place of *sole*, so adjectival *only* is also amenable to an analysis according to which 'at least' is presupposed and 'at most' is at issue. Further

[12] Argumental uses are more complicated because they involve quantified presuppositions that pertain to the CQ; see Coppock & Beaver (2012a) for further discussion of this phenomenon.

[13] Note that *sole* and adjectival *only* are actually not focus-sensitive, in the sense that placement of focus does not affect interpretation. The question that they introduce are 'What things have the property P?' and the answer to that question is determined wholly by the element that *only/sole P* is predicated of. In a predicative case like *John is the sole owner*, it could be argued that *John* is the focus on grounds that John corresponds to the answer to the CQ. But placement of focal emphasis does not affect whether John corresponds to the answer; this is lexically determined by *sole*. Furthermore, in cases like *The only person who came to my birthday party sits in a wheelchair*, with *sole/only* in an argument NP, there is no constituent that corresponds to the answer to the question.

evidence that the *at least* component is not at issue comes from the fact that *one* can be reinforced with *only* but not vice versa: *the one and only. . .* vs. **the only and one*. (*The one and sole* appears to be less idiomatic but possible: e.g. in the attested but mis-apostrophized *The one and sole thing that Chuck Norris fears is Demon's Souls*.)

The negative component of *only* is also targeted by emotive factives, unlike the positive component:

(57) She better be glad that falsifying student records is the **only** thing she is being investigated for!

This speaker presumably does not expect the woman in question to be glad that she is being investigated for falsifying student records.

2.2.4 *exclusive* Analogous observations can be made for other exclusives. *Exclusive* gives rise to *at most* and *at least* inferences involving possession. For example, consider (58), which involves what we call the *rights-modifying* use of *exclusive*, this and further uses being discussed in Section 4.4. (58) implies both (59) and (60).

(58) He has **exclusive** rights.
(59) **At most** $[\text{he}]_F$ has rights.
(60) **At least** $[\text{he}]_F$ has rights.

If (58) is negated, the 'at least' inference survives. Thus (61) implies (60).

(61) He doesn't have exclusive rights.

In other words, (61) means that he has rights, and someone else does. Here are some attested examples involving negation:

(62) Gentleness, self-sacrifice and generosity are the **exclusive** possession of **no** one race or religion.

This seems to imply that for all races and religions, if they possess these qualities, there is an additional race or religion that also does.

(63) Open houses are **not** the **exclusive** right of real estate agents or builders.

Similarly, this seems to imply that real estate agents and builders have the right to open houses and so do other entities.

Reinforcement also patterns as one would expect under the assumption that the 'at least' component is presupposed:

(64) He has rights, and he has **exclusive** rights.
(65) #Nobody else has rights, and he has **exclusive** rights.

Furthermore, emotive factives target the negative component in the meaning of *exclusive*:

(66) I just get annoyed that NBC has **exclusive** rights to televising the Olympics in the US. I miss the good old days of all the networks covering it so you could get different events on different channels or different perspectives of the same event.

The speaker of (66) would presumably be annoyed if NBC lost the rights to televise the Olympics in the US, and that was all that changed. Thus *exclusive*, like *only*, *mere*, adjectival *only*, and *sole*, presupposes 'at least' and contributes 'at most' as part of its at-issue content.

2.2.5 *alone* Finally, consider adnominal *alone*. Like *only*, adnominal *alone* contributes an *at most* component and presupposes an *at least* component. Both (67a) and (67b) imply that (at least) man is moral; (67a) implies that no other classes of beings have this property; (67b) implies the opposite.

(67) a. It is man **alone** who is moral.
b. It isn't man **alone** who is moral.

Analogous observations can be made for the following pair:

(68) a. Treatment consisted of chemotherapy **alone**.
b. Treatment did not consist of chemotherapy **alone**.

In both cases, chemotherapy was involved. Hence *alone*, like *only*, presupposes an *at least* component, and contributes an *at most* component as part of its ordinary at-issue meaning.

2.3 MAX *and* MIN

Beaver and Clark (2008) provide a way of making precise the idea that exclusives presuppose 'at least' and make an at-issue contribution of 'at most'. The 'at least' part of the meaning is expressed with MIN, and the 'at most' part is expressed by MAX. The MAX and MIN operators relate to the current question under discussion (CQ; Roberts 1996),[14] which contains a set of alternative propositional answers, ranked by strength; MIN(ϕ) means that there is a true answer to the CQ that is at least as

[14] We use 'CQ' rather than 'QUD' (Ginzburg 1996; Roberts 1996) to underline that we are referring only to the single most burning question in what may be a stack of questions.

strong as the prejacent, ϕ (i.e. 'of the alternative possible answers, at least ϕ'); MAX(ϕ) means that ϕ is an upper bound on them ('of the alternative possible answers, at most ϕ').

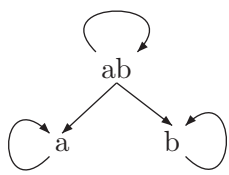
Beaver and Clark's theory assumes that a context S provides not only a common ground INFO_S (a proposition, e.g. a set of worlds), but also a current question under discussion CQ_S (a set of answers), and a strength ranking over the alternatives $\geq_S$ (a binary relation over the answers). S can be thought of as standing for 'information state'. Let us be a bit more explicit about the nature of information states. If we have the ranking, we can recover the question under discussion; it is the set of things that are ranked. And from that we can recover the information in the common ground. For example, suppose the question in S is 'Who snores?', and the possible answers are:

$a = \{w_{10}, w_{11}\}$	'Ann snores'
$b = \{w_{01}, w_{11}\}$	'Bill snores'
$ab = \{w_{11}\}$	'Ann and Bill snore'

If ab is stronger than both a and b, and a and b are unranked with respect to each other then we have the following state:

$$\geq_S = \{\langle ab,a\rangle, \langle ab,b\rangle, \langle a,a\rangle, \langle b,b\rangle, \langle ab,ab\rangle\}$$

In a more visual format:



The CQ of S, CQ_S, can be defined as the field of that relation, the set of possibilities that are ordered by the relation (cf. Krifka 1999).

(69) **CQ of a state**
The CQ of state S, $\text{CQ}_S = \{p \mid \exists p' \ [p \geq_S p' \text{ or } p' \geq_S p]\}$

In our example, the CQ of S is:

$$\text{CQ}_S = \{a, b, ab\}$$

The informational content of S, S^*, is the union over all possibilities in CQ_S.

(70) **Informational content of a state**
If S is a state, then the informational content of S, $S^* = \cup \text{CQ}_S$

The informational content of a state is a set of possible worlds. The informational content of the state in our example is $\{w_{01}, w_{10}, w_{11}\}$. The informational content of a state represents the Stalnakerian common ground for the conversation so far, and it is here that presuppositions should be satisfied.

We use the following formalization of MIN and MAX, where p is a variable over propositions (functions from possible worlds to truth values), and w is a variable over worlds:[15]

(71) $\text{MIN}_S(p) = \lambda w.\ \exists p' \in \text{CQ}_S\ [p'(w) \wedge p' \geq_S p]$

(72) $\text{MAX}_S(p) = \lambda w.\ \forall p' \in \text{CQ}_S\ [p'(w) \rightarrow p \geq_S p']$

MIN(p) expresses the proposition that holds at a world w if there is a proposition among the answers to the current question that is true in w, and that proposition is at least as strong as p. In other words, something at least as strong as p holds in w. MAX(p) is true in w if that there are no propositions among the answers to the CQ that are both stronger than the prejacent and true in w. The meaning of *only* can be captured by the following expression, where the colon and the period enclose material that is presupposed, in the fashion of Heim and Kratzer (1998).[16]

(73) $[\![only]\!]^S = \lambda p\ .\ \lambda w : \text{MIN}_S(p)(w)\ .\ \text{MAX}_S(p)(w)$

This is a scalar analysis because the alternatives are ranked in terms of strength. We will henceforth refer to the function that *only* denotes as ONLY.

According to this analysis, *only* associates not with focus but with the current question under discussion. It is focus-sensitive, however, because of the Focus Principle, which regulates the relationship between the CQ and focus. Beaver and Clark's (2008) formulation of the Focus Principle is as follows: 'Some part of a declarative utterance should evoke a set of alternatives containing all the Rooth-Hamblin alternatives of the CQ' (p. 37). An expression α 'evokes' all of the alternatives in the CQ if the CQ is a subset of the alternative semantic value of the expression, $[\![\alpha]\!]^A$. The alternative set for an unfocused atomic constituent is

[15] On Beaver and Clark's definition of MIN, which is slightly different from the one in (71), 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.

[16] Note that here the presupposed content involving MIN constrains the discourse context, and specifically the CQ. So our notion of presupposition is broader than that employed in some accounts where presuppositions constrain a Stalnakerian *context set*. See Coppock and Beaver (2012a) for a detailed formal analysis of the presuppositions discussed in this paper, given in terms of a dynamic semantics that makes explicit how contexts of the sort introduced by Stalnaker and Heim can be extended to keep track of questions under discussion.

the singleton set containing the ordinary semantic value 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, through pointwise functional application (essentially as in Rooth 1985). In these terms, the Focus Principle says that the CQ must be a (possibly non-proper) subset of the alternative semantic value of some part of the utterance.[17]

Not every declarative sentence is required to denote an answer to the CQ, but a declarative utterance should still syntactically *contain* an answer to the question. For example, *I think Mary is coming* is felicitous in a context where the CQ is 'Who is coming?'. Hence the formulation using 'some part of a declarative utterance' rather than just 'a declarative utterance'. Beaver and Clark's focus principle can therefore be split up into two sub-principles:[18]

(74) **Focus Principle**
   a. Some part of a declarative utterance should give an answer the CQ.
   b. If Q is a set of Rooth-Hamblin alternatives, and A is a natural language expression, then A gives an answer to Q if the focus value of A is a subset of Q.

Note that the Focus Principle is quite similar to Rooth's (1992) *question-answer constraint*: "In a question answer pair $\langle Q, A \rangle$, the ordinary semantic value of Q is a subset of the focus value of A" (p. 96). In the case of a question under discussion, there may be no explicit question to calculate the ordinary semantic value of, but it is still the case here that the focus value of the answer should be a subset of some question-meaning (the CQ, here). There is only a minor conceptual difference between the Beaver and Clark theory of how *only* relates to its alternatives and Rooth's. On Rooth's theory, the principle by which *only* relates to its alternatives and the question–answer constraint are special cases of his Focus Interpretation Principle. Under the present approach, following Roberts (1996), questions and focus particles are both governed by the question–answer constraint; the Focus Principle *is* (a modified version of)

[17] The 'Rooth-Hamblin alternatives', unlike Groenendijk & Stokhof's (1984) answers, but like Hamblin's (1971) alternatives, do not necessarily 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 snores?' includes ⟦Ann snores⟧, ⟦Bill snores⟧, ⟦Ann and Bill snore⟧, etc.

[18] Cf. Groenendijk & Stokhof's (1984) distinction between 'giving an answer' and 'being an answer': a proposition *gives* an answer if it entails an element of the question; it *is* an answer it if is one of the elements of the question.

the question–answer constraint (whereas Rooth's Focus Interpretation Principle has the question answer constraint as a special case). This means that there are fewer special cases under the present approach. One could argue on such grounds that it is more unified, but we do not take this to be a deciding factor. The reader is free to replace all references to the CQ with Rooth's C, and assume that his ∼-operator is used to set its value.

We opt for the Beaver-and-Clark-style framework over Rooth's primarily for the sake of ease when it comes to dealing with scales. Under a Rooth-style approach, a theory of where the strength ranking comes from and how it relates to the alternatives would have to be developed. Krifka (1999) makes steps in that direction; Krifka's alternative semantic values are not sets of ordinary semantic values, but rather relations over them. Some further questions would have to be answered in order to raise this idea to the status of a usable framework: How should the Focus Principle be stated? What provides the ranking over sub-sentential constituents? In Krifka's (1999) system, the ranking is projected from the lexicon, and this is clearly not a viable assumption. These questions are already answered in the Beaver and Clark framework, where the strength ranking over the salient set of alternatives is provided by the information state. This makes it slightly handier for our purposes in its present form. We would however be quite open to a reformulation of our ideas in a Rooth-style framework that incorporated a strength ranking over the alternatives.

At this point, it is already possible to see that our analysis of *only* explains why it gives rise to *at least* and *at most* inferences, under the assumption that MIN and MAX express *at least* and *at most* respectively. The analysis of *at least* advocated by Büring (2008), who follows Krifka (1999) to a very large extent, is in fact equivalent to MIN under certain very general assumptions, as discussed by Coppock and Brochhagen (2012). Coppock and Brochhagen argue for analyses of *at least* and *at most* that are truth-conditionally equivalent to MIN and MAX respectively, and differ only pragmatically (in particular, it is argued that they are "inquisitive" in the inquisitive semantics sense).

In the following sections, we will offer two ways of parameterizing (73) to account for a wide range of exclusives.

3 THE TYPE PARAMETER

The previous section established the common core of meaning shared by the exclusives under consideration: a MIN presupposition and an at-

issue MAX contribution. The variation among exclusives can be captured as differences of semantic type and constraints on the CQ and the strength ranking. We turn now to the semantic type parameter.

3.1 *A difference of scope*

Beaver and Clark treat *only* a function of type $\langle p,p\rangle$, where once again p is short for $\langle s,t\rangle$, the type of propositions. This approach can account for both its NP-modifying use, illustrated in (75), and its VP-modifying use, illustrated in (76):

(75) **Only** John$_F$ invited Mary.
(76) John **only** invited Mary$_F$.

A $\langle p, p\rangle$ analysis could also work for *mere* in a predicative sentence like (77), but it does not work for cases in which *mere* modifies the head of an argumental noun phrase, as in (78).

(77) Google was a **mere** conduit.
(78) A **mere** child succeeded.

The alternatives that *mere* eliminates in this case do not include for example 'An adult succeeded', i.e. sentence-sized alternatives. If this alternative were excluded, then (78) would imply that there was no adult who also succeeded, but there is no such implication. Rather, the alternatives are simple predications of x, where x is the discourse referent corresponding to the subject, like 'x is an adult'. An appropriate paraphrase for this sentence would be *Someone who is only a child succeeded*, with *only* inside a relative clause predicating the property of being a child. In other words, *mere* takes scope within the NP.

3.2 *Property-modifying MAX/MIN*

3.2.1 *Adjectival exclusives* Our proposal for *mere* and other adjectival exclusives is as follows, where lower case subscripts on the variables indicate types:

(79) **Core meaning for adjectival exclusives**
$\text{P-ONLY}_S = \lambda P_{\langle e,p\rangle} \,.\, \lambda x : \text{MIN}_S(P(x)) \,.\, \text{MAX}_S(P(x))$

We name this function P-ONLY because it is a modifier of properties, being of type $\langle\langle e,p\rangle,\langle e,p\rangle\rangle$. Note that P-ONLY results from applying the Geach rule to (73). The Geach rule converts a function f with type $\langle a,b\rangle$ into a function f' with type $\langle\langle c,a\rangle,\langle c,b\rangle\rangle$ of the form λR .

$\lambda x\,.\,f(R(x))$, where R has type $\langle c, a\rangle$ and x has type c. In the case of (79), a and b are p, and c is e, and f is ONLY.[19]

Analyzing *mere* as P-ONLY gives us the following interpretation for *John is a mere employee*:

(80) $(\text{P-ONLY}_S(\text{EMPLOYEE}))(\text{J})$

where EMPLOYEE has type $\langle e, p\rangle$, and J has type e. This is equivalent to $\text{ONLY}_S(\text{EMPLOYEE}(\text{J}))$.

The interpretation for *A mere child succeeded* under our analysis is as follows:

(81) $\exists x\ [(\text{P-ONLY}_S(\text{CHILD}))(x) \wedge \text{SUCCEEDED}(x)]$

Given an appropriate S, for example one in which 'x is a child' is ranked below 'x is an adult',[20] this correctly predicts that (78) does not imply that there was no adult who also succeeded.

This type can also be applied to the other adjectival exclusives, *sole*, *only*, and *exclusive*. We will show how this yields the right truth conditions after we illustrate the settings of the question parameter that these exclusives require in Section 4.

3.2.2 *VP*-only P-ONLY can also be used for VP-*only*, if we assume that the denotation of a VP is a property. Let us assume that *introduced* denotes the the ternary predicate INTRODUCE. Then the interpretation of *John only introduced [Bill]$_F$ to Sue* under this analysis will be as follows, with an information state S in which the question is who John introduced to Sue:

(82) $\text{P-ONLY}_S(\lambda x\ .\ \text{INTRODUCE}(\text{B})(\text{S})(x))(\text{J})$

This *only* can also be deployed to represent the meaning of *John is only an employee*, giving (80) as an interpretation, as for *John is a mere employee*.[21] We can thus account for the intuitive equivalence between *John is a mere employee* and *John is only an employee*, and the fact that both presuppose *John is at least an employee* and entail *John is no more than an employee*.

[19] Thanks to Walter Pedersen at SALT 2011 for noting that our type shifts follow the Geach rule.

[20] See Coppock & Beaver (2012a) for discussion of local CQs containing bound variables.

[21] While this constitutes a slight departure from (or enrichment of) Beaver & Clark's lexical entry for *only*, it should be pointed out that the idea of deriving VP-*only* through such a type-shifting rule is also present in Rooth's (1985) dissertation. The lexical entry for *only* can thus be seen as a synthesis of Rooth's (1985) entry and a slight variant of Beaver & Clark's (2008) entry. The idea of *only* as a 'flexible type operator' was also discussed by Büring & Hartman (2001), and taken up by Klinedinst (2005).

3.2.3 *Minimal sufficiency readings of NP-modifying* just As discussed above in Section 2.1.3, NP-modifying *just* typically gives rise to rank-order readings, as in the following example:

(83) **Just** the thought of him sends shivers down my spine.

If we replace *just* with *only*, a very different meaning pops out:

(84) **Only** the thought of him sends shivers down my spine.

Whereas (84) implies that nothing other than the thought of him sends the shivers (hence, something even more palpable, such as his presence or touch would not), (83) implies or suggests that his presence or touch would certainly send shivers if it did not produce an even greater effect. This can be described as a 'minimal sufficiency reading'; his touch is (minimally) sufficient to induce the effect in question. We propose that minimal sufficiency readings are rank-order readings with NP-internal scope.

We propose to analyze the NP as a property, obtained through type shifting, and to analyze *just* as P-ONLY. A sentence like *Just the thought of him sends shivers down my spine* will be analyzed as 'Something that is only the thought of him sends shivers down my spine'. To obtain this result, we send *the thought of him* through a sequence of type-shifts. Let us use THOUGHT as a shorthand for the denotation of *thought of him*, and assume that *the thought of him* denotes ιx [THOUGHT(x)]. For the sake of discussion, we can call this individual H. We assume that this denotation gets converted to a quantifier with Partee's (1986) LIFT.

(85) $\text{LIFT} = j \mapsto \lambda P \ . \ P(j)$

LIFT(H) is a function of type $\langle\langle e,p\rangle,p\rangle$, the set of all properties characterizing H. This cannot yet be fed as an argument to P-ONLY, because a property is required. The next step is thus to apply Partee's (1986) BE shift, which converts generalized quantifiers to properties:

(86) $\text{BE} = G \mapsto \lambda x \ . \ G(\lambda y[y = x])$

BE(LIFT(H)) will be a property, the property of being equal to H.

To this property, P-ONLY can apply, giving another property. An NP-type denotation is obtained through an implicit existential quantifier, introduced with Partee's A-shift.

(87) $\text{A} = Q \mapsto \lambda P \ . \ \exists x \ [Q(x) \ \wedge \ P(x)]$

The result is as follows:

(88) $[\![\textit{just the thought of him}]\!]^S$
$\textsc{a}(\textsc{p-only}(\textsc{be}(\textsc{lift}(\iota x\ [\textsc{thought}(x)]))))$
$= \lambda P\ .\ \exists x\ [\textsc{only}_S(x = \iota x\ [\textsc{thought}(x)])\ \wedge\ P(x)]$

The interpretation of the full sentence *just the thought of him sends shivers down my spine* is then equivalent to:

(89) $\exists x\ [\textsc{only}_S(x = \iota x\ [\textsc{thought}(x)])\ \wedge\ \textsc{sends-shivers}(x)]$

The alternatives that MAX relates to would be alternative characterizations of x: 'x is his presence', 'x is his touch', etc. This accounts for the possibility of paraphrasing *just the thought of him* as 'something so insignificant as the thought of him'.

Grosz (2012) has a different analysis of minimal sufficiency readings. Following in the footsteps of Guerzoni (2003, ch. 4), he assumes that there is a bleached exclusive meaning, $\textsc{only}^2$, which expresses only that the prejacent is low on the relevant scale, and is truth-conditionally vacuous, contributing no upper- or lower-bounding components. In our framework, this analysis could be expressed as follows:

(90) $\textsc{only}^2_S = \lambda p : \textsc{most}\ q \in \textsc{cq}_S\ [q \geq_S p]\ .\ p$

where the MOST clause provides the presupposition that the prejacent is relatively low on the scale. Importantly, this means that *just* has a reading on which it contributes no at-issue content. *Just* is ambiguous between a normal exclusive meaning and this bleached meaning, according to Grosz, and the latter is what gives rise to minimal sufficiency readings.

Grosz's assumption that *just* has no at-issue content successfully captures the fact (83) does not imply that nothing other than the thought of him sends shivers down the spine. The lowness presupposition also explains the possibility of paraphrasing the subject as 'something so insignificant as the thought of him'. Our analysis differs from Grosz's in that *just* contributes an upper bound as part of its at-issue content, within the scope of the NP, but in the case we are considering, this contribution does not affect the truth conditions. Thus both analyses capture the facts presently under discussion. We have shown, however, that it is possible to maintain a unified analysis of exclusives in the face of such examples, and that an additional lexical entry is not necessary. In other words, our theory is more parsimonious. In future work, we hope to compare the two theories in detail to find out if and where there are any substantive empirical differences, but that project deserves more space than we can allot to it within the present paper.

The question naturally arises of course as to why *only* does not seem to participate in this type-shifting shenanigan. We suggest that it is because *only* has a violable preference for entailment scales. This is only a preference, however; it is possible to find minimal sufficency readings for *only*. Consider the following web example.

(91) **Only** a small percentage would be enough for a big-scale scam to take off.

This does not mean that a large percentage would not be enough for a big-scale scam to take off. That would be almost impossible to imagine, so in this case commonsense knowledge overrides *only*'s preference. Note also that some native English speakers allow a minimal sufficiency reading for *Only the thought of him sends shivers down my spine*. Assuming that the contrast between *just* and *only* has to do with scale preferences rather than resulting from a lexical ambiguity provides the flexibility needed to deal with this kind of example. See Section 4.5 for further evidence that the presence or absence of minimal sufficiency readings is related to scale preferences; there a correlation will be shown between requiring an entailment scale and failing to give rise to minimal sufficiency readings.

3.3 *Quantifier-modifying* MAX/MIN

Given that VP-*only* can be analyzed as P-ONLY, the reader might have begun to wonder whether we need a sentence-operator version of *only* as in (73) at all. In the following section, we will show that NP-modifying *only* can be analyzed in non-sentence-operator fashion as well.

3.3.1 *NP-modifying* only NP-modifying *only* as in *Only John smokes* would not be amenable to an $\langle e,p\rangle$-modifier analysis, but it need not be analyzed as $\langle p,p\rangle$ either. Although it appears sentence-initially, it seems to combine syntactically with the subject, as evidenced by the following dialogue:

(92) A: Who smokes?
B: **Only** John.

To analyze this case, we may assume that *John* denotes a generalized quantifier (type $\langle\langle e,p\rangle,p\rangle$), and that *only* is of type $\langle\langle\langle e,p\rangle,p\rangle,\langle\langle e,p\rangle,p\rangle\rangle$.

This result can also be obtained by applying the Geach rule to (73). Recall that the Geach rule converts a function f with type $\langle a,b\rangle$ into a function f' with type $\langle\langle c,a\rangle,\langle c,b\rangle\rangle$ of the form $\lambda R\,.\,\lambda x\,.\,f(R(x))$, where R

has type $\langle c, a\rangle$ and x has type c. Here, a and b are p again, but this time c is $\langle e, p\rangle$. We call the result Q-ONLY, for 'quantifier-modifying *only*'.

(93) $\text{Q-ONLY}_S = \lambda Q_{\langle\langle e,p\rangle,p\rangle} \,.\, \lambda P_{\langle e,p\rangle} \,.\, \text{ONLY}_S(Q(P))$

Recall that LIFT is the function that converts an individual to the characteristic function of the set of properties it has: $j \mapsto \lambda P \,.\, P(j)$ (Partee 1986). With this, we propose the following interpretation for *Only John smokes*:

(94) $\text{Q-ONLY}_S(\text{LIFT}(\text{j}))(\text{SMOKES})$

This is equivalent to: $\text{ONLY}_S((\text{LIFT}(\text{j}))(\text{SMOKES}))$, with the denotation of the VP *inside* the scope of ONLY.

With an entailment scale, ONLY_S creates a Strawson Downward Entailing environment in its scope (von Fintel 1999, Coppock & Beaver 2011).[22] Hence this analysis correctly predicts that NP-modifying *only* licenses NPIs in the VP, even though the VP is outside its (surface) syntactic scope.

(95) **Only** John **ever** said **anything** nice to me.

3.3.2 *Adnominal* alone Q-ONLY can also be used in the analysis of adnominal *alone*, which appears to be very much like NP-modifying *only* in its exclusive use;[23] *He alone can save us now* seems equivalent to *Only he can save us now*. Like NP-modifying *only*, adnominal *alone* licenses NPIs outside its syntactic scope:

(96) He persisted with the poise he (**alone**) **ever** possessed.
(97) And it is a characteristic of man that he **alone** has **any** sense of good and evil, of just and unjust, and the like, and the association of living beings who have this sense makes a family and a state.

(Example (97) comes from a translation of Aristotle's *Politics*.) The analysis of *John alone smokes*[24] would thus be the same as *Only John smokes*, as in (94).

3.3.3 *Quantifier-modifying mere* Further support for the usefulness of Q-ONLY in the analysis of exclusives comes from uses of *mere* modifying

[22] When the scale is not an entailment scale, MAX/MIN does not produce a Strawson Downward Entailing environment in its scope, so lack of NPI licensing cannot be used on its own to show that a given exclusive does not take scope over a given region of a sentence.

[23] Moltmann (2004) labels this the 'property-related reading' of *alone*, and suggests that it cannot be assimilated to its other uses such as in *John played alone*. The relationship between these uses should be explored more in future work.

[24] This particular sentence is slightly odd; *alone* seems to require a certain gravitas, stylistically.

quantifiers, as in (98). In such cases, *mere* licenses NPIs outside of its syntactic scope, in the VP (as discussed in Coppock and Beaver, to appear).

(98) ?(A **mere**) 3% **ever** really make this business model work for them.

(99) I toiled for decades on a Wisconsin campus on which ?(a **mere**) 18% of the entering freshmen **ever** graduate.

We propose that in examples like (98) and (99), *mere*'s argument denotes a generalized quantifier, and *mere* has type $\langle\langle\langle e,p\rangle, p\rangle,\langle\langle e,p\rangle,p\rangle\rangle$. We assume that the indefinite article is inserted for syntactic reasons and contributes nothing to the semantics.[25] So the structure of, for example, *A mere 18 freshmen graduated* is:

(100) $\text{Q-ONLY}_S(\text{EIGHTEEN}(\text{FRESHMEN}))(\text{GRADUATED})$

where EIGHTEEN is a function of type $\langle\langle e,p\rangle,\langle\langle e,p\rangle,p\rangle\rangle$, producing a function of type $\langle\langle e,p\rangle,p\rangle$ when applied to FRESHMEN (type $\langle e,p\rangle$). This is equivalent to:

(101) $\text{ONLY}_S((\text{EIGHTEEN}(\text{FRESHMEN}))(\text{GRADUATED}))$

with the VP *inside* the scope of ONLY. This accounts for the fact that NPIs are licensed in the VP by quantifier-modifying *mere*, even though they are outside its syntactic scope.

3.4 *Un-Geached MAX/MIN*

The question now arises as to whether there are any exclusives that should be analyzed as type $\langle p,p\rangle$, without any Geaching at all. One candidate would be the *only* that appears in the following example, because it seems to attach to a proposition:

(102) I think she would have come oftener, **only** she did not like to appear to us without gifts in her hands. *Charles Dickens, 'Two Sides of a story', Transatlantic Magazine, 1871*

This *only* is not an exclusive, however, but rather an exceptive (evidence: it can be paraphrased by *except*).

[25] A reviewer suggests analyzing 18% *of the NP* as denoting 'the set of *x*s that are 18% of the NP', i.e. as a property, in order to avoid generating **A many students came*. Since we are assuming that the article is inserted for syntactic reasons, we do not make a mistaken prediction that this sentence is grammatical. We also avoid generating **An 18% of the students came*, and explain the fact that *18% of the students* can serve on its own as a DP.

Another sentence-initial exclusive we have in English can be found in imperatives as in:

(103) **Just** give her a call!

This seems to be paraphrasable as 'I am not asking for more than that you give her a call'; in other words, the exclusive seems to take scope over the speech act. It may be that intensifier uses of exclusives as in *This is simply amazing!* are related to this 'metalinguistic' use, as it were. It is not clear that speech acts are propositions, so it is not clear that this usage involves the Beaver and Clark *only*.

Another candidate is the *only* that appears in *if only* constructions:

(104) If **only** God would give me some clear sign! Like making a large deposit in my name at a Swiss bank.—Woody Allen.

If only is arguably not compositional in English. It cannot be used in non-optative contexts in English, as shown by the oddness of #*If only I had left a few minutes later, I would have missed my train.* (See also Rifkin 2000; Biezma 2011; and Grosz 2012.)

The only viable candidate that we are aware of comes from German. Grosz (2012) shows that German *nur* 'only' can be used non-optatively in pre-sentential position, with wide focus on the antecedent proposition (adapted from Grosz's (553a)):

(105) [The society believed that social change could be achieved]
... wenn nur niemand seine Rechnungen bezahlte
if only nobody his bills paid
'... if nobody paid his bills [and this is easy to achieve]'

This could be paraphrased, '... if it was only the case that nobody paid his bills', suggesting a wide focus interpretation. Exclusives generally associate with focus in their syntactic scope. Assuming that the syntactic scope corresponds to the first argument, wide focus would signal that the entire proposition is serving as the first (and only) argument to *nur* in this example. We therefore have evidence that exclusives can be of type $\langle p,p\rangle$, the simplest type an exclusive can take in our system.

3.5 *Relation-modifying* MAX/MIN

The final instantiation of the type parameter that we will observe is a modifier of binary relations, type $\langle\langle e,\langle e,p\rangle\rangle,\langle e,\langle e,p\rangle\rangle\rangle$. This is the result of applying the Geach rule with $c = e$ to P-ONLY. We call it R-ONLY, because it modifies relations.

(106) $\text{R-ONLY}_S = \lambda R_{\langle e,\langle e,p\rangle\rangle}\ \lambda y\ .\ \lambda x\ .\ \text{ONLY}_S(R(y)(x))$

We will see more specific instantiations of this variant in the discussion of *sole* and *exclusive* below.

3.6 *Summary and discussion*

So far, we have discussed four semantic types for exclusives:

(i)	$\langle e,p\rangle$ modifiers	(P-ONLY)
(ii)	$\langle\langle e,p\rangle,p\rangle$ modifiers	(Q-ONLY)
(iii)	$\langle e,\langle e,p\rangle\rangle$ modifiers	(R-ONLY)
(iv)	p modifiers	(ONLY)

Each one of these can be obtained through a (possibly null) sequence of Geaching operations on Beaver and Clark's original lexical entry. The last one of course is the case where no Geaching operations have applied. The first one was obtained by Geaching with $c = e$, the second one was obtained by Geaching with $c = \langle e,p\rangle$, and the third one was obtained by Geaching twice with $c = e$. We can therefore represent the type parameter as a possibly null sequence of types, corresponding to how c is instantiated in a sequence of Geaching operations over the original Beaver and Clark entry. Let us use square brackets and semi-colons rather than angle brackets and commas to represent the sequence, to avoid confusion with semantic types. The sequences can then be represented as follows:

(i)	$[e]$	(P-ONLY)
(ii)	$[\langle e,p\rangle]$	(Q-ONLY)
(iii)	$[e\ ;\ e]$	(R-ONLY)
(iv)	$[]$	(ONLY)

Further relevant sequences may be identified in future research. For example, the sequence $[\langle e,p\rangle\ ;\ \langle e,p\rangle]$ would yield a modifier of generalized quantifiers like *most*. This might be at work in sentences like *Only most of the students passed (not all)*. On the other hand, there may be a complexity limit on the sequence and the types in it.

It cannot be the case that all of these Geaching operations are performed 'online' as it were. This is especially improbable in light of our conclusion that English lacks the original wholly un-Geached variant. Moreover, such a process would produce *mere* from *only*, which is absurd. The different exclusives also lexically impose different constraints on the question under discussion, as we will discuss next. It cannot even be the case that these operations take place in the lexicon, for the same reasons. We can only say that Geaching operations appear to delineate the space of types for exclusives. It does seem reasonable

however that quantifier-modifying *mere* is derived from property-modifying *mere* in this fashion; this accords with the fact that *mere* is more frequent in its simpler use, and allows us to capture all the additional constraints that the two uses have in common vis-a-vis the nature of the scale without having to stipulate those constraints twice.

4 CONSTRAINTS ON THE CQ

Type differences of the kind discussed in Section 3 are not enough to explain all of the differences in meaning between exclusives. Many exclusives, including VP-modifying *only* and *exclusively*, and adjectival *only* and *mere*, are $\langle e,p\rangle$ modifiers. But the questions they answer are different.

4.1 *Mere*

Consider *the mere graduate student* vs. *the only graduate student*. In both cases, the theory already presented guarantees that MAX(GRAD(x)) is at-issue, and MIN(GRAD(x)) is presupposed. So what are the possible CQs in each case, and how can those CQs result in such different meanings?

To support intuitions as to the difference between *mere* and adjectival *only*, consider the fact that when *mere* is paraphrased with adverbial *only*, focus goes on the nominal property; *the mere graduate student* is someone who is *only a [graduate student]*$_F$. By contrast, for *the only graduate student*, a natural paraphrase is *someone such that only he*$_F$ *[among the relevant characters] is a graduate student*. But in this paraphrase, focus is on a constituent which is not even present in the original. We will now show how to capture this contrast using CQ constraints.

For *mere*, we propose that the CQ is 'What properties does x have?', which we notate $?P[P(x)]$. Given a value for x, this expression denotes the set of propositions of the form $P(x)$, varying in how P is instantiated.

This alone does not rule out the possibility that the answers to the question 'What properties does x have?' are organized such that, for example, 'x is a child' is ranked below 'x is a child and a chess player', and 'x is a child and a Maria Callas fan', etc., forming a boolean lattice of properties. All it requires is that the focus alternatives are properties of x, and this is too weak. If that type of scale were possible then *She is a mere child* should have a reading paraphrasable as *She is nothing other than a child*, contrary to fact.

One possible way of explaining the absence of complement exclusion readings with *mere* is to require that the answers to the question be ranked as a total order. This might be too strong; consider the following example:

(107) Out of all of the dances they could have chosen, I'm amazed that they stepped onto that stage with a **mere** Merengue.

It does not seem reasonable to assume that there is a total order on dances in this context.

The intuitive notion of 'power' seems to work fairly well as a property with which to rank the answers to a *mere* question, but 'power' must be construed very liberally in order to account for the following:

(108) My new job will start a **mere** few weeks after the contract arrives.
(109) More than a **mere** iPhone case. Every bit as luxe as it looks.
(110) Cajun food is not a **mere** fad.

In each of these cases, along with many other examples with *mere*, the higher ranked answers have more power in a certain sense – power to affect people. Adults have more power to affect people than children (because they are stronger, etc.), a salsa dance has more power to affect people than a merengue (because it is more impressive), many weeks have more power to affect people than few weeks (because a lot more can happen in many weeks than in a few), a fancy iPhone case has more power to affect people than a plain one (because it is more impressive), and a cultural revolution has more power to affect people than a fad (obviously). This notion of power correlates with 'impressiveness', 'excitement' and 'significance', but notice that it is not always natural to say that *a* is more impressive, exciting, or significant than *b* when *a* is higher on a scale used by *mere* than *b*. Cultural revolutions are more significant, exciting, and impressive than fads, but one might not want to say that adults are more significant, exciting, or impressive than children. But 'power to affect people' works for all of these cases.

Power to affect people is a property of individuals, but in order to rank the answers to the question, we need a property of propositions. Let POWER-OF(a) be a's power to affect people. If $P(x)$ and $P'(x)$ are two answers to the question $?P[P(x)]$, then it should hold that *in general*, if $P(y)$ and $P'(z)$ then POWER-OF(y) > POWER-OF(z). Let us use POWER to signify that a scale has this property.

Then we can give a lexical entry for *mere* as follows (a gloss appears on the righthand side; note that the indented conditions

occur between a colon and a period, indicating that they are presuppositions):

(111) $[\![mere]\!]^S$
$= \lambda P_{\langle e,p\rangle} \,.\, \lambda x_e \,.\, \lambda w \,:$
$\quad \text{CQ}_S \subseteq ?P'[P'(x)] \;\wedge$ // *What is x like?*
$\quad \text{POWER}(\geq_S) \wedge$ // *strength: power to affect people*
$\quad \text{MIN}_S(P(x))(w) \,.$ // *at least P*
$\text{MAX}_S(P(x))(w)$ // *at most P*

Like *only*, *mere* has an 'at least' presupposition expressed with MIN and an 'at most' presupposition expressed with MAX, which accounts for the fact that *mere* gives rise to 'at least' and 'at most' inferences. The fact that *mere* presupposes a question about the properties of *x* distinguishes *mere* from adjectival *only* (see next section). And the POWER constraint serves to rule out a readings on which *She is a mere child* does not mean that she has no (relevant) properties other than that of being a child.

There do seem to be cases where higher-ranked properties entail lower-ranked properties *and* the higher-ranked ones are associated with more power to affect people.

(112) Joining Miles Davis at age 17, Williams proved to be more than a **mere** prodigy, amazing listeners worldwide with his fluid interdependence and ease in expressing abstract ideas.

This example does not suggest that Williams is not a prodigy, even though it claims that he had some higher-ranked property.[26] In this case, it seems that what is ranked higher is something like 'prodigy and full-fledged musician'. Indeed, someone with both properties has more power to affect people than someone who is only a prodigy, so our analysis correctly predicts that a scale organized by conjunction would be allowable in this case.

The lexical entry in (111) also allows us to account for the intuitive equivalence between *Google is a mere conduit* and *Google is only a conduit*. If the CQ is a set of answers to the question 'What is Google?' ranked so that 'Google is a conduit' is ranked below 'Google is a directly responsible party' or something to that effect, and it holds in the common ground that Google is at least a conduit, then the presuppositions of both *mere* and *only* will be satisfied, and in both cases the sentence will be true in worlds where $\text{MAX}_S(\text{CONDUIT}(\text{GOOGLE}))$ holds, meaning effectively that Google is no more than a conduit.

[26] Thanks to a reviewer for this observation.

4.2 *Adjectival* only

For adjectival *only* (which we refer to as $only_{\text{N}}$, the subscript indicating the syntactic category of what it modifies) the question is not what properties x has, but what things have property P. So the CQ denotation $?P'[P'(x)]$ in (111) is replaced by $?y[P(y)]$ in the following:

(113) $[\![only_{\text{N}}]\!]^S$ (preliminary version)

$= \lambda P_{\langle e,p\rangle} \,.\, \lambda x_e \,.\, \lambda w \;:$

$\quad \text{CQ}_S \subseteq ?y[P(y)] \wedge$ // *Who Ps?*

$\quad \text{ENTAILMENT}(\geq_S) \wedge$ // *strength: entailment*

$\quad \text{MIN}_S(P(x))(w) \,.$ // *at least x*

$\text{MAX}_S(P(x))(w)$ // *at most x*

This is a function from properties P to properties that hold of x in world w if and only if $\text{MAX}(P(x))$ holds in w. It is defined only if $\text{MIN}(P(x))$ holds in w, and the CQ is a set of answers to the question 'What things are in the extension of P?'.

As it stands, (113) will not quite work, because stronger answers should be sums of individuals to which the property P will not necessarily apply. For example, if P is the predicate TEACHER, then this predicate may apply to both Alice and Bob, but not to the sum of Alice and Bob. To be more precise, we are assuming, following Link (1983), that the domain of individuals contains non-atomic sums of individuals, so, for example, the sum of a and b is written $a \oplus b$. Individuals are parts of their sums, and the part-of relation is written $\sqsubseteq_i$, so that, for example, $a \sqsubseteq_i a \oplus b$. In this example we have a *proper* part relation as well, written $\sqsubset_i$. Individuals that have no individuals as parts are called *atoms*. For the meanings of plural nouns, we use a cumulativity operator '*', ''working on 1-place predicates P, which generates all the individual sums of members of the extensions of P'' (Link 1983: 130). Link defines the extension of $*P(x)$ as the complete join-subsemilattice in the domain of individuals generated by the extension of P. This boils down to the following:

(114) **Cumulativity operator (definition)**
For all x, $*P(x)$ iff for all atoms y such that $y \sqsubseteq_i x$, $P(y)$.

For example, if TEACHER(a) and TEACHER(b) then $*$TEACHER$(a \oplus b)$ (even though the unstarred predicate TEACHER might not hold of that sum).

With these tools in hand, the lexical entry for adjectival *only* can be stated as follows:

(115) $[\![only_{\mathrm{N}}]\!]^S$
$= \lambda P_{\langle e,p\rangle} \,.\, \lambda x_e \,.\, \lambda w$:
$\textsc{cq}_S \subseteq ?z[^*P(z)] \wedge$ // *Who Ps?*
$\textsc{entailment}(\geq_S) \wedge$ // *strength: entailment*
$\textsc{min}_S(P(x))(w)$. // *at least x*
$\textsc{max}_S(P(x))(w)$ // *at most x*

In words, this is a function from properties P to properties that hold of x in world w if and only if $\textsc{max}(P(x))$ holds in w. It is defined only if $\textsc{min}(P(x))$ holds in w, and the CQ is a set of answers to the question 'What things are in the extension of $^*P$?', ranked by entailment. The predicate ENTAILMENT characterizes relations R such that $R(a)(b)$ if and only if a entails b, i.e., for all w, if $a(w)$ then $b(w)$. This ensures that the strength relation will correspond to the part-of relation $\sqsubseteq_i$. Thus, stronger answers correspond to more people.

Applied to the property TEACHER, for example, $[\![only_{\mathrm{N}}]\!]$ yields a function that is defined for individuals x if and only if $\textsc{teacher}(x)$ is entailed by all the true answers to the question of what things are in the extension of *TEACHER. In other words, x is a teacher. When it is defined, the function returns the proposition that 'x is a teacher' entails all the true answers to the question of what things are in the extension of *TEACHER; in other words, nobody else is a teacher.

Recall that one of the goals of the paper is to explain the equivalence between pairs like *Only Jane is a teacher* and *Jane is the only teacher*. In order to provide an analysis of examples like *Jane is the only teacher*, we need a lexical entry for the definite article that is appropriate for predicative uses of definite descriptions. Coppock and Beaver (2012c) argue that this type of example shows that predicative uses of definites are not associated with an existence presupposition, because *Jane isn't the only teacher* gives rise to the *anti-uniqueness* implication that there is more than one teacher, which in turn implies that there is no entity that satisfies the predicate ONLY(TEACHER); existence disappears. Coppock & Beaver (2012c) analyze the definite article as an identity function on predicates with a *weak uniqueness* presupposition: if there is any satisfier of the predicate, then there is only one. In the case where the predicate is *only teacher*, it is logically impossible for the cardinality of the extension to be greater than one, so the weak uniqueness presupposition is always satisfied. The result is that *the only teacher* means the same thing as

only teacher. That function can be applied to Jane if Jane is a teacher, and it returns true if there are no teachers other than Jane. This is of course the result that we obtain from *Only Jane is a teacher* as well, so, if we adopt this proposal, the two are correctly predicted to be equivalent.[27]

As discussed by Coppock and Beaver (2012c), the distribution of articles with *only* is predicted once we combine the fact that *only teacher* always satisfies the uniqueness presupposition of *the* with the principle *Maximize Presupposition!* (Heim 1991; Schlenker 2011). This principle requires a speaker to choose a presuppositionally stronger expression when available *ceteris paribus*. Given that *only teacher* satisfies the presuppositions of *the*, the resulting prediction is that it should not be compatible with the indefinite determiner *a(n)*, which we take to lack presuppositions. This prediction is borne out:

(116) a. *She is an only teacher.
b. *An only teacher tends to be lonely.

In our dialects, there is one noun with which *only* allows an indefinite article: *child*.

(117) a. She is an only child.
b. An only child tends to be lonely.

This appears to be an idiosyncratic exception: it does not tolerate modification between *only* and the noun as in **an only smart child*, and the noun *child* has to be interpreted relationally after *only*. However, as a reviewer points out, it is possible to find uses of *only* with other kinship terms on the internet.

(118) a. My son is an only child—an only cousin, even—so I couldn't let him hunt alone!
b. I'm an only cousin. I'm the only kid at family reunions. I'm the only only child in the grade.
c. William A.'s maternal grandmother was an only cousin to President Lincoln.

Or, as Peter Cook remarked: *Tragically, I am an only twin*. We will suggest a lexical entry for *child-only* (or kinship-*only*, as the case may be) in the context of our discussion of *sole*, which also allows indefinite determiners.

[27] See Coppock & Beaver (2012c) for further justification of the proposal regarding *the*.

4.3 *Sole*

4.3.1 *Relational* sole *Sole* is similar in meaning to adjectival *only*; something that is *the sole reason I came* is also *the only reason I came* and vice versa. However, *sole* is compatible with the indefinite article and *only* is not:

(119) If the business is owned by a(n) **sole**/***only** owner (the business is not a corporation or LLC), only the owner is eligible to be the managing officer.

We explain this difference between *sole* and *only* by assuming that *sole* has an additional use as modifier of functions of type $\langle e,\langle e, p\rangle\rangle$, i.e. relational nouns.

As observed by Partee (1997), relational and non-relational nouns behave differently with respect to the following paradigm:

(120) a. John's team
b. That team is John's.

(121) a. John's granddaughter
b. #That granddaughter is John's.

Phrases like *(sole) owner* pattern with relational nouns:

(122) a. Microsoft's (sole) owner
b. #That (sole) owner is Microsoft's.

This shows that the noun that *sole* combines with in (119) is relational, and that the phrase remains so after *sole* is added. Further evidence for this comes from *have*. With relational nouns, *have* seems to require indefinite determiners, as Partee (1999) discusses.

(123) a. John has a car.
b. John has every car.

(124) a. John has a sister.
b. *John has every sister.

Again, *(sole) owner* patterns with the relational nouns:

(125) a. Microsoft has a(n) (sole) owner.
b. *Microsoft has every (sole) owner.

These patterns can be explained by assuming that *sole* takes a relational noun argument (type $\langle e,\langle e,p\rangle\rangle$), and returns a function of the same type.

We propose the following for this 'relational *sole*', which we notate $sole_R$:[28]

(126) $[\![sole_R]\!]^S$
$= \lambda R_{\langle e,\langle e,p\rangle\rangle} \,.\, \lambda y \,.\, \lambda x \,.\, \lambda w$:
$\text{CQ}_S \subseteq ?z[^*(R(y))(z)] \wedge$ // *Who is an R of y?*
$\text{ENTAILMENT}(\geq_S) \wedge$ // *strength: entailment*
$\text{MIN}_S(R(y)(x))(w)$. // *at least x*
$\text{MAX}_S(R(y)(x))(w)$ // *at most x*

The input relation R takes two arguments: a possessor argument (e.g. the one expressed in an *of*-PP) and a 'referential argument' (the argument that gets quantified over when the noun combines with a quantifier, etc.). It combines with the possessor argument first. For example, if R is the denotation of *owner*, then the first argument of R corresponds to the thing owned, and the second argument corresponds to the owner. (Note that the owner is, somewhat counterintuitively, not the possessor in this case.) The output is another binary relation, taking again two arguments, first y then x. This relational version of *sole* presupposes that the question is what entities stand in the R relation to y (glossed *Who is an R of y?*). The CQ in our example is who is an owner of y. We have applied the cumulative operator to the result of applying R to its first argument, for reasons analogous to those discussed above in connection with *only*. Answers are ranked by entailment, so stronger answers mean more owners. It is presupposed that *sole*'s second (referential) argument x is an R of y, and at-issue that there is no larger sum of individuals that is.

Let us analyze *Microsoft has a sole owner* to see how this analysis works. We assume, following Partee (1999), that the indefinite article *a* and the verb *have* have special meanings for relational nouns, defined as follows:

(127) $[\![a_R]\!] = \lambda R_{\langle e,\langle e,p\rangle\rangle} \,.\, \lambda P_{\langle e,t\rangle} \,.\, \lambda y \,.\, \exists x \,[R(y)(x) \wedge P(x)]$
(128) $[\![have_R]\!] = \lambda Q_{\langle\langle e,t\rangle,\langle e,t\rangle\rangle} \,.\, Q(\text{EXIST})$
where $\text{EXIST} = \lambda z \,[z = z]$

[28] This analysis differs from the one presented in Coppock and Beaver (2012b), and can be seen as a replacement for what they refer to as 'anti-comitative *sole*'. That analysis was not adopted here because it fails to explain the behavioral parallels between noun phrases with *sole* and those consisting of relational nouns.

The denotation of *sole*$_R$ *owner* is as follows:

(129) $[\![sole_R\ owner]\!]^S$
$\lambda y\ .\ \lambda x\ .\ \lambda w$:
$\quad \textsc{cq} \subseteq ?z[^*\textsc{owner}(y)(z)] \wedge$
$\quad \textsc{entailment}(\geq)\ \wedge$
$\quad \textsc{min}(\textsc{owner}(y)(x))(w)\ .$
$\textsc{max}_S(\textsc{owner}(y)(x))(w)$

The indefinite article and *have* would then combine as follows (presupposition not shown):

(130) $[\![a_R\ sole_R\ owner]\!]^S$
$= \lambda P_{\langle e,t\rangle}\ .\ \lambda y\ .\ \lambda w\ .\ \exists x\ [\textsc{max}_S(\textsc{owner}(y)(x))(w)\ \wedge\ P(x)]$

(131) $[\![has_R\ a_R\ sole_R\ owner]\!]^S$
$= \lambda y\ .\ \lambda w\ .\ \exists x\ [\textsc{max}_S(\textsc{owner}(y)(x))(w)\ \wedge\ x = x]$

Applied to Microsoft, this gives:

(132) $[\![Microsoft\ has_R\ a_R\ sole_R\ owner]\!]^S$
$= \lambda w\ .\ \exists x\ [\textsc{max}_S(\textsc{owner}(\textsc{ms})(x))(w)\ \wedge\ x = x]$
$= \lambda w\ .\ \exists x\ [\textsc{max}_S(\textsc{owner}(\textsc{ms})(x))(w)]$

We assume that the presupposition on the existentially quantified variable x yields an existential presupposition on the global context to the following effect:

(133) Presupposition of $[\![Microsoft\ has_R\ a_R\ sole_R\ owner]\!]^S$:
$\lambda w\ .\ \exists x\ [\textsc{cq} \subseteq ?z[^*\textsc{owner}(\textsc{ms})(z)]\ \wedge$
$\textsc{entailment}(\geq)\ \wedge$
$\textsc{min}_S(\textsc{owner}(\textsc{ms})(x))(w)]$

In words, this says that the question under discussion is who owns Microsoft, with answers ranked as a Boolean lattice, and there is someone who owns it. The contribution of MAX in (132) in this context is that Microsoft has no owners other than the one presupposed to exist. Hence Microsoft has only one owner.

In some cases, it seems that the possessor argument can be existentially bound. Consider the following example:

(134) Many **sole** proprietors require professional advice for this phase of their income tax report.

This can be restated less elegantly as follows: Many of the individuals for whom there is some business of which only they are a proprietor require such professional advice. Partee & Borschev (2003) define a conversion called SORT which yields a sortal noun from a relational noun as follows:

(135) $\text{SORT} = R \mapsto \lambda x \,.\, \exists y \,[R(y)(x)]$

Applied to $[\![sole_R\ proprietor]\!]$, this yields $\lambda x \,.\, \exists y[\text{SOLE(PROPRIETOR)}(y)(x)]$, which captures our inelegant paraphrase.[29]

4.3.2 only child At this point, let us revisit the variant of *only* that occurs before *child* and allows indefinite determiners. This can be analyzed as a version of relational *sole* that is specialized for particular relations. For our dialects, the only allowable relation is the 'child of' relation, but for other dialects the constraints on R may be looser, allowing for any kinship relation, for example. The proposed lexical entry is as follows:

(136) $[\![only_{child}]\!]^S$
$= \lambda R_{\langle e,\langle e,p\rangle\rangle} \,.\, \lambda y \,.\, \lambda x \,.\, \lambda w :$
$\text{CQ}_S \subseteq ?z[^*(\text{CHILD-OF}(y))(z)] \wedge$ // *Who is an R of y?*
$\text{ENTAILMENT}(\geq_S) \wedge$ // *strength: entailment*
$\text{MIN}_S(R(y)(x))(w) \,.$ // *at least x*
$\text{MAX}_S(R(y)(x))(w)$ // *at most x*

The MIN and MAX conditions require that $R(y)(x)$ is an answer to the CQ. Since the CQ is about children, this will force R to be the CHILD-OF relation.

4.3.3 *Other lexical entries for* sole We assume two additional lexical entries for *sole* as well. We maintain that there is, in addition, a variant of *sole* that is synonymous with adjectival *only*. This variant is found only in definite descriptions, and accounts for the fact that *have* does not like to combine with definite descriptions containing relational nouns, but can combine with definite descriptions with *sole*:

(137) *John has the sister.
(138) John has the sole winning ticket.

[29] This conversion process may be a lexical derivation process subject to ratification by the speech community rather than a component of grammar, because some of its outputs do not seem to exist in English. Partee and Borshev note the contrasts among *Many teachers/mothers/parents/#brothers/#uncles voted for John*.

Replacing *sole* with *only* in (138) yields a sentence that is equally natural and means the same thing. So the acceptability of (138), which would be mysterious under the assumption that *sole* has only its relational use, and suggests that *sole* can also mean *only*. We can refer to this version of *sole* as $sole_N$, signifying that, like $only_N$, it is a modifier of (ordinary) common nouns.

Coppock & Beaver (2012b) argue that *sole* can also function as a cardinality term, and include *one* and *single* in that category. In (139), we do not appear to have relational *sole*, because the noun that *sole* combines with is sortal, and relational nouns do not occur in the same construction as easily (cf. (140)), with or without *sole* (cf. (141)). As shown by the impossibility of *only* in (139), we do not appear to have the variant of *sole* that is synonymous with *only*, either.

(139) A(n) **sole**/***only** woman was at the party.
(140) ?A(n) aunt/granddaughter/neice was at the party.
(141) ?A **sole** author was at the party.

Furthermore, ignoring the acceptability contrast, (139) and (141) are not semantically parallel. (139) conveys that only one woman was at the party, while (141) conveys that there was one person who is the only author of a book at the party, but there may have been other authors as well.

Another difference between *sole* and *only* that Coppock & Beaver (2012b) point out is that *sole*, along with *single* and *one*, can modify superlatives, while *only* cannot:

(142) This is the **sole**/**single**/**one**/#**only** biggest threat.

Other cardinal terms can do this as well:

(143) These are the **two** biggest threats.

This leads Coppock & Beaver (2012b) to the conclusion that *sole* and *single* can function as cardinality terms. Exactly what it means to be a cardinality term depends on what the best analysis of cardinals is.[30] In any case, this assumption would explain the contrast in acceptability and meaning between (139) and (141); *a sole woman was at the party* would mean *one woman was at the party*, and would convey that there were no other women at the party through a scalar implicature, under standard neo-Gricean assumptions. Following Coppock & Beaver (2012b), we make an ontological distinction between cardinality terms and exclusives, so this use of *sole* is not an exclusive use. We conclude that *sole* has two exclusive uses: one

[30] See Kennedy (2012) for a recent overview.

synonymous with adjectival *only* ($sole_N$), and one that modifies relational nouns ($sole_R$), and one non-exclusive use, as a cardinality term ($sole_C$).

4.4 *Exclusive*

We now turn to *exclusive*, which has several distinct exclusive uses.

4.4.1 *Rights-modifying use of* exclusive One use of *exclusive* modifies a noun that describes a contractual right. On this use, *exclusive* concerns the question of who is the possessor or owner of the right. Typically the modified noun is abstract, taking no determiner, the verb is *have*, and *exclusive N* can be paraphrased as *N such that nobody/nothing else has N*.

(144) Does Patient's Compensation Fund have *exclusive jurisdiction over future medical claims*?
'jurisdiction over future medical claims such that nobody else has such jurisdiction'

(145) You do not have *exclusive access to the database* at this time.
'access to the database such that nobody else has such access'

(146) CNN's Nima Elbagir has an *exclusive phone interview* with Libyan leader Moammar Gadhafi's wife, Safia Gadhafi.
'interview which nobody else would have the right to'

All of these cases involve a certain right that only one entity has. If Patient's Compensation Fund has exclusive jurisdiction over future medical claims, then they have the right to make the relevant kind of decisions and nobody else has that right. If someone has exclusive access to the database, then they have the right to access the database and nobody else has that right. If Nima Elbagir has an exclusive phone interview with Safia Gadhafi, then Nima Elbagir has the right to do a phone interview with Safia Gadhafi, and nobody else has that right.

Interviews are not inherently related to rights, so (146) suggests that *exclusive* can introduce the concept of rights into the discussion on its own. However, rights can also be explicitly mentioned:

(147) Nima Elbagir has an/the **exclusive** right to interview Safia Gadhafi.

In order to give a unified account of (147) and (146), we propose that on this particular lexical meaning, the polysemous *exclusive* presupposes rights to be under discussion.

The concept of a 'right' can be explicated in terms of deontic modality. If *a* has a right to have property *P*, then it is allowed, legally or by another set of rules, that $P(a)$. Let us use $\textsc{right}(P)(y)(x)$ to represent the

notion that x is a right to have property P, and that y has x. In this formula, x, the right itself, corresponds to the referential argument of the noun *right*. We can then introduce the following meaning postulate in order to explicate the relationship between rights and deontic modality:

(148) **Meaning postulate for rights**
$\exists x[\textsc{right}(P)(y)(x)(w)] \leftrightarrow \Diamond_w[P(y)]$
'If x is a right to P and y has x in w, then y can P in w'

(We use the diamond symbol to represent deontic modality, and $\Diamond_w\phi$ means that ϕ holds in some world that is deontically accessible from w. Variables are implicitly universally quantified by default.)

We assume that *exclusive* takes as its first argument a relation with a possessor argument and a referential argument. The conditions on the CQ require that this relation entail that the possessor has some right. The 'at least' and 'at most' components of *exclusive* pertain to potential possessors.

(149) $[\![\textit{exclusive}_R]\!]^S = \lambda R\ .\ \lambda y\ .\ \lambda x\ .\ \lambda w$:
$\textsc{cq}_S \subseteq ?y'[R(y')(x) \wedge \exists P[R \subseteq \textsc{right}(P)]] \wedge$ // *Who can have an R?*
$\textsc{entailment}(\geq_S) \wedge$ // *strength: entailment*
$\textsc{min}_S(R(y)(x))(w)$. // *at least y*
$\textsc{max}_S(R(y)(x))(w)$ // *at most y*

Given a possessor y, it is presupposed that at least y has the relevant right, and at-issue that at most y has the relevant right. In the case where *exclusive* modifies a noun phrase of the form *right to V*, the 'rights' condition will clearly be satisfied. In other cases, some coercion is in order.

Let us consider (146) in detail. We can assume that *interview* is coerced into a relational concept with a contextually salient possessor relation, and the possessor argument represents the interviewer (cf. *Nima Elbagir's exclusive interview of Safia Gadhafi*).

(150) $[\![\textit{interview}_1]\!] = \lambda x\ .\ \textsc{interview}(x)$
(151) $[\![\textit{interview}_2]\!] = \lambda y\ .\ \lambda x\ .\ \textsc{interview}(x) \wedge \textsc{poss}(x)(y)$

This relation does not satisfy *exclusive*'s requirement that the relation confer a right upon the possessor, so it must be coerced into a right.

It will not do to assume that *exclusive interview* is shorthand for *exclusive right to interview*; compare:

(152) a. Elbagir's exclusive interview with Gadhafi lasted three hours.
b. #Elbagir's exclusive right to interview Gadhafi lasted three hours.

To the extent that it means anything, the latter sentence can only mean that there was a three hour duration during which Elbagir had an exclusive right to interview Gadhafi; the former sentence means that the interview itself lasted three hours. So an exclusive interview is an interview, and an exclusive right to do an interview is not. However, an exclusive interview entails a right to do an interview.

Let us therefore assume that *interview* can undergo a shift that retains its interviewhood and also introduces deontic modality:

(153) $f_{\Diamond} : R \mapsto \lambda y \,.\, \lambda x \,.\, R(y)(x) \wedge \Diamond \exists x'[R(y)(x')]$

(This shift is presumably only allowed in cases like the one under consideration, where a presupposition will be violated unless it takes place. But note that the possibility of such a shift explains the consistency of e.g. 'I had an interview with Jagger, but he didn't turn up': this is consistent if 'interview' is interpreted as 'right to an interview', but would be inconsistent if 'having an interview' entailed the existence of an event of interviewing.) Applied to $interview_2$, $f_{\Diamond}$ will yield:

$$\lambda y \,.\, \lambda x \,.\, \textsc{interview}(x) \wedge \textsc{poss}(x)(y) \wedge \Diamond \exists x'[\textsc{interview}(x') \wedge \textsc{poss}(x')(y)]$$

This relation (call it $R_{\Diamond}$) will satisfy *exclusive*'s requirements, because there is a P such that $R_{\Diamond} \subseteq \textsc{right}(P)$, namely $\lambda y \,.\, \exists x'[\textsc{interview}(x') \wedge \textsc{poss}(x')(y)]$. If there is an x such that $R_{\Diamond}(y)(x)$, it follows that $\Diamond[P(y)]$.[31] Thus it is correctly predicted that *exclusive* can combine with *interview*. This analysis also derives the fact that *Nima Elbagir has an exclusive interview with Safia Gadhafi* means that nobody other than Elbagir may interview Gadhafi.

This analysis also correctly captures the oddness of the following example:

(154) David has an exclusive hat.
'David has a unique and classy hat.'
'Only David has rights to a hat.'

According to our analysis, on the rights-modifying use, this sentence would mean that nobody other than David is allowed to have a hat, and that is absurd.[32]

[31] $R_{\Diamond}$ is not equivalent to $\textsc{right}(P)$, because it imposes other conditions as well, but all that is required is a one-way entailment, as expressed with $\subseteq$.

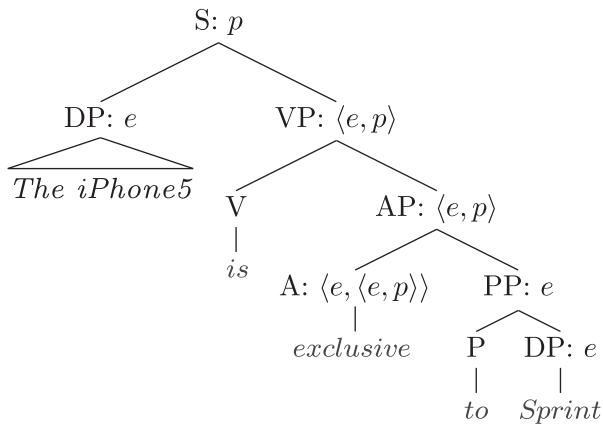
[32] This example does have what we call a 'classy' interpretation. Other 'classy' uses of *exclusive* can be seen in examples like: *I have not yet been privy to an invite into the* **exclusive** *boy's club* or *The evening reception will be the most* **exclusive** *part of the day and it's the invite everyone wants*. While this 'classy' use is clearly related insofar as it expresses a limit on participation in some privilege, this limitation cannot be captured with MAX or expressed with *at most* so we do not consider it an exclusive use.

Notice that *exclusive* can be used predicatively, with the possessor introduced by *to*, being predicated of the possessum.

(155) a. Jurisdiction over future medical claims is **exclusive** to Patient's Compensation Fund.
b. Heavy Rain Dev is **exclusive** to Sony.
c. The iPhone5 is **exclusive** to Sprint.

This sets *exclusive* apart from the other adjectival exclusives; things cannot be *sole* or *only* or *mere*. We suggest that in such cases, the first (relational) argument is implicit. The result is a function of type $\langle e,\langle e,p\rangle\rangle$, which works combinatorically as follows:

(156)



4.4.2 *Role-modifying* exclusive When *exclusive* occurs with a noun which denotes a participant of an event, it cannot be paraphrased with *have*, typically does *not* occur as the object to verbs of having, and it has a purely exclusional meaning, like *sole*.

(157) Rogers Wireless will be the *exclusive provider of the iPhone in Canada*
'provider x of the iPhone such that nobody other than x provides the iPhone'
'#provider of the iPhone in Canada such that nobody else has a provider of the iPhone'

(158) Confluence Watersports will appoint Palm Equipment International to be the *exclusive distributor of Wilderness Systems*
'distributor x of WS such that nobody other than x is distributing WS'
'#distributor of WS such that nobody else has a distributor of WS'

While the modified noun in such cases is typically deverbal, there are some other role-denoting nouns that license association with a non-possessor:

(159) The video-streaming website [Netflix] revealed that it will be the *exclusive home of Arrested Development* when new episodes air come 2013.
'home of AD such that nobody else is a home/host of AD'

(160) In particular, the words 'believe', 'expect', 'intend', 'anticipate', 'estimate', 'may', 'will', variations of such words, and similar expressions, identify forward-looking statements, but are not the *exclusive means of identifying such statements*, and their absence does not mean that the statement is not forward-looking.
'means of identifying such statements such that nothing else is a means of identifying such statements'

Unlike the rights-modifying cases, these cases can be paraphrased at least roughly with *sole/only*: the exclusive distributor of Wilderness Systems is the sole distributor of Wilderness systems. However, *exclusive* and *sole* are not quite the same:

(161) She is the **only/sole/??exclusive** author of the paper.
(162) She has a(n) **sole/??exclusive** grandchild.

We can capture this data by using a variant of (149) in which the possessor and referential argument roles are reversed. In *distributor of Wilderness Systems*, Wilderness Systems is the possessor argument and the distributor is the referential argument. The question is what other individuals have the opportunity to play the distributor role. If the possessor is the first argument to the relation, then the question should be $?x'[R(y)(x')]$ rather than $?y'[R(y')(x)]$ as we had for 'rights-modifying' *exclusive* above. Furthermore, the possessor of the right in this case does not correspond to the possessor argument of the modified noun phrase; rather the roles are reversed. Let $\textsc{inv}(R) = \lambda y\,.\,\lambda x\,.\,R(x)(y)$. Then we can capture these intuitions as follows:

(163) $[\![\textit{exclusive}_\theta]\!]^S = \lambda R\,.\,\lambda y\,.\,\lambda x\,.\,\lambda w$:
$\textsc{cq}_S \subseteq ?x'[R(y)(x') \wedge \exists P[\textsc{inv}(R) \subseteq \textsc{right}(P)]] \wedge$ // *Who can be an R?*
$\textsc{entailment}(\geq_S) \wedge$ // *strength: entailment*
$\textsc{min}_S(R(y)(x))(w)\,.$ // *at least y*
$\textsc{max}_S(R(y)(x))(w)$ // *at most y*

This lexical entry correctly predicts that an exclusive distributor of Wilderness Systems is someone such that nobody else is allowed to

distribute Wilderness Systems. It also captures the overlap in meaning between this use of *exclusive* and *sole*; it is essentially a more specific version of *sole*. However, this lexical entry also explains why someone would not normally be described as someone else's *exclusive grandchild*; this would mean that nobody else is allowed to be that person's grandchild.

4.4.3 *Verbal uses of* exclusive There is yet another use of *exclusive*, and this one does not associate with a possessor. On what we call the *verbal* use, the modified noun is deverbal and event-denoting and the 'and nothing else' entailment is associated with an internal argument of the verb from which the noun is derived (which is not a possessor).

(164) Permanent seating is preferred to the *exclusive use of movable chairs*.
'use of moveable chairs and nothing else'

(165) The high definition disc format war has turned into a battle royale with the recent announcements of the *exclusive support of the HD DVD format* by Paramount and Dreamworks animation.
'support of the HD DVD format and nothing else'

(166) Federally funded abstinence-only programs require the *exclusive teaching of abstinence until marriage*
'teaching of abstinence until marriage and nothing else'

These uses can be paraphrased with *exclusively*, with focus on the object. Exclusive use of moveable chairs is exclusively using moveable chairs; exclusive support of the HD DVD format is exclusively supporting the HD DVD format; exclusive teaching of abstience is exclusively teaching abstinence. Relatedly, this use of *exclusive*, on which it associates with a non-possessor argument, seems limited to deverbal nouns. For example, the following cases are unambiguous:

(167) ??We disprefer an **exclusive** seating area of moveable chairs.
(168) ??She has an **exclusive** library of HD DVD format (films).

Like *mere*, this use can be analyzed using a Geaching operation that yields a predicate modifier. The difference between *exclusive* on this use and *mere* is that *exclusive* requires that the alternatives are ranked in a manner that corresponds to the sum operation over individuals, with stronger answers corresponding to more individuals. Also, the

modified noun denotes a type of eventuality, which we indicate in the following lexical entry by using the variable e rather than x:

(169) $[\![\textit{exclusive}_v]\!]$
$\lambda P \,.\, \lambda e \,.\, \lambda w : \textsc{min}_S(P(e))(w) \wedge \textsc{entailment}(\geq_S) \,.\, \textsc{max}_S(P(e))(w)$

If v is the type of eventualities, then the instantiation of the type parameter for this exclusive would be $[v]$, representing a single Geaching operation with $c = v$.

4.5 *Adverbial exclusives*

Finally, let us briefly consider the differences among the adverbial exclusives *only*, *exclusively*, *just*, *solely*, and *purely*. Beaver and Clark (2008, 69) point out that *exclusively* has only complement exclusion readings:

(170) #She's **exclusively** an assistant professor.

This can only mean, 'assistant professor' is her only relevant property. The same observation holds for *solely* and *purely*. We can capture this constraint by requiring that the strength ranking is entailment, which means that its stronger answers correspond to plural sums consisting of more properties.

(171) $[\![\textit{exclusively/solely/purely}_{\text{VP}}]\!]^S$
$\lambda P_{\langle e,p\rangle} \,.\, \lambda x \,.\, \lambda w :$
$\quad \textsc{min}_S(P(x))(w) \wedge$
$\quad \textsc{entailment}(\geq_S) \,.$
$\textsc{max}_S(P(x))(w)$

We speculate that future research will show that *purely* should be analyzed in terms of a scale of 'purity', in some sense to be made more precise.

All of these words seem to have uses as NP-modifiers:

(172) Procedural transparency helps to ensure that **exclusively** the law guides decisions in competition cases.
(173) He states that the earth in fact endured recurring catastrophes, such as deluges and fires from the air that **solely** the Egyptians survived.
(174) The custom became so important that **purely** the length of her neck would determine a girl's beauty.

So we may assume that they also instantiate Q-ONLY.

(175) $[\![\textit{exclusively/solely/purely}_{\text{NP}}]\!]^S$
$\lambda Q_{\langle\langle e,p\rangle,p\rangle} \,.\, \lambda P_{\langle e,p\rangle} \,.\, \lambda w :$
$\text{MIN}_S(Q(P))(w) \wedge$
$\text{ENTAILMENT}(\geq_S) \,.$
$\text{MAX}_S(Q(P))(w)$

It does not appear as if these exclusives have NP-modifier uses with minimal sufficiency readings:

(176) #**Exclusively/solely/purely** the thought of him sends shivers down my spine.

This result follows from our assumption that these exclusives are $\langle\langle e,p\rangle, p\rangle$-modifiers with an entailment scale requirement when they modify NPs.

In contrast to *only*, it seems that *merely* is not as amenable to complement-exclusion readings:

(177) I (**only**/#**merely**) like (**only**/#**merely**) [Apple computers]$_F$.

But there do seem to be examples of complement-exclusion readings with *merely*:

(178) An epicurean is someone who likes **merely** the finest food and drink.

(179) Mr. Watts selected **merely** the strong points of his case, and labored them with an earnestness and zeal approaching to fury.

The notion of 'power to affect people' that was invoked for *mere* does not seem wholly applicable to these cases. In (179), for example, the points that are excluded in this case are the weaker ones, with less power to affect the case in his favor. One difference between (177) and (179) seems to be that the alternatives are ranked evaluatively. In (177), there seems to be no presumption that liking both Apple and Microsoft computers is any better or worse than liking (only) Apple computers. In (178) and (179), however, the higher-ranked alternatives, in which more mediocre food or weak points are allowed in, receive a negative evaluation. We find *merely* with evaluative scales in which higher-ranked alternatives are better than lower-ranked alternatives as well:

(180) How can people be happy or satisfied with **merely** the 'norm'?

We conclude that *merely* requires an evaluative scale, which we symbolize with the predicate EVALUATIVE. This predicate holds of a scale

if the answers are ranked according to what the speaker considers good or bad.

(181) $[\![merely_{VP}]\!]^S$
$= \lambda P\,.\,\lambda x\,.\,\lambda w:\ \text{MIN}_S(P(x))(w) \wedge \text{EVALUATIVE}(\geq_S)\,.\,\text{MAX}_S(P(x))(w)$

Merely can also modify NPs, but has at least a very strong affinity for minimal sufficiency readings. It is an odd replacement for *exclusively*, *solely*, and *purely*, respectively in (172)–(174), and web searches for 'that merely the' yield only examples of the following kind.

(182) **Merely** the suspicion that someone is a 'Zwangij' could easily result in his being killed.

(Note also that *exclusively*, *solely*, and *purely* are not acceptable replacements for *merely* in (182).) We therefore assume that *merely*'s use as an NP-modifier has an $\langle\langle e,p\rangle,\langle e,p\rangle\rangle$-type denotation, and yields minimal sufficiency readings through type-shifting in the manner described above for *just*.

In light of the contrast between *just* and *only* with respect to minimal sufficiency readings, it would be reasonable to surmise that *just* disallows complement-exclusion readings, like *merely*. However, this is not the case. It is possible to get complement exclusion readings with *just*, for example:

(183) If you selected **just** the visible cells in step 8, then you effectively printed **just** the visible data.

These uses appear to be much more difficult to find, but nevertheless perfectly natural. Thus we do not wish to rule out the possibility that *just* can give rise to a complement exclusion reading. The difference between *only* and *just* that makes them behave differently in contexts where *just* gives rise to minimal sufficiency readings is, we believe, a difference in the scale preferences among the two exclusives: *only* prefers entailment scales and *just* has a slight preference for non-entailment scales. We must leave it open how these kinds of soft preferences should be modelled.

5 CONCLUSION

Adverbs including *only*, *just*, *merely*, *purely*, *simply*, *exclusively*, *solely*, and adjectives including *only*, *sole*, *mere*, and *exclusive* have (sometimes multiple) lexical meanings that have the following in common, where π is the prejacent:

- MIN(π) is presupposed
- MAX(π) is at-issue

They differ along the following dimensions:

- The type parameter: a sequence of types corresponding to Geaching operations starting from the original Beaver and Clark entry;
- The CQ parameter: constraints on the CQ;
- The ranking parameter: constraints on how the answers to the CQ are ranked.

The range of types for the exclusives we have discussed has been shown to be limited to those that can be obtained via a sequence of Geaching operations on the $\langle p,p\rangle$ lexical entry for *only* that Beaver and Clark propose. These include: $[e]$, $[\langle e,p\rangle]$, $[e\ ;\ e]$, and $[v]$. This means that if the first argument to the exclusive is α, then α's type will end in p, and the subsequent arguments $\beta_1,\ldots\beta_n$ will be such that $\alpha(\beta_1)\ldots(\beta_n)$ is of type p, and the output is a proposition.

Taking into consideration the CQ and ranking parameters, the exclusives we have studied thus fit into the following schema.

(184) **Lexical entry schema for exclusives**

$$\begin{array}{ll}
\lambda\alpha\ .\ \lambda\beta_1\ .\ \ldots\ .\ \lambda\beta_n\ .\ \lambda w: & \\
\quad \textsc{cq}_S \subseteq \Omega\ \wedge & \textit{// CQ parameter} \\
\quad \Gamma(\geq_S)\ \wedge & \textit{// strength parameter} \\
\quad \textsc{min}_S(\alpha(\beta_1)\ldots(\beta_n))(w)\ . & \textit{// at least } \gamma \\
\textsc{max}_S(\alpha(\beta_1)\ldots(\beta_n))(w) & \textit{// at most } \gamma
\end{array}$$

The parameters correspond to how the Greek letters are instantiated. The question parameter corresponds to Ω, and the strength parameter corresponds to Γ. The type parameter, formalized as a sequence of specified Geaching operations, determines how many β_{is} there are, and the types of the arguments.

Table 1 summarizes the various exclusive meanings discussed in this paper. The same form is sometimes associated with multiple parameter settings, as the table shows. The example number giving the lexical entry is listed under 'Ex[ample]'; 'Cat[egory]' indicates the syntactic category that the item typically modifies; 'Type' indicates how the semantic type parameter is instantiated. Under 'Question' we have informally characterized the nature of the question required, and under 'Strength', we have indicated how the exclusive requires the answers to the CQ to be ranked. When there is a violable preference for a certain type of strength ordering, we have indicated it using parentheses.

Form	Ex.	Cat.	Type	Question	Strength
$only_{VP}$	(79)	VP	$\langle e,p\rangle$		(entailment)
$just_{VP}$	(79)	VP	$\langle e,p\rangle$		
$merely_{VP}$	(181)	VP	$\langle e,p\rangle$		evaluative
$exclusively_{VP}$	(171)	VP	$\langle e,p\rangle$		entailment
$purely_{VP}$	(171)	VP	$\langle e,p\rangle$		entailment
$solely_{VP}$	(171)	VP	$\langle e,p\rangle$		entailment
$merely_{P}$	(181)	NP	$\langle e,p\rangle$		evaluative
$just_{P}$	(79)	NP	$\langle e,p\rangle$		
$only_{NP}$	(93)	NP	$\langle\langle e,p\rangle,p\rangle$		(entailment)
$just_{NP}$	(93)	NP	$\langle\langle e,p\rangle,p\rangle$		
$exclusively_{NP}$	(175)	NP	$\langle\langle e,p\rangle,p\rangle$		entailment
$purely_{NP}$	(175)	NP	$\langle\langle e,p\rangle,p\rangle$		entailment
$solely_{NP}$	(175)	NP	$\langle\langle e,p\rangle,p\rangle$		entailment
$alone_{NP}$	(93)	NP	$\langle\langle e,p\rangle,p\rangle$		entailment
$only_{N}$	(115)	N′	$\langle e,p\rangle$	Who *P*s?	entailment
$sole_{N}$	(115)	N′	$\langle e,p\rangle$	Who *P*s?	entailment
$only_{child}$	(136)	$child_{N}$	$\langle e,\langle e,p\rangle\rangle$	Who is a child of *y*?	entailment
mere	(111)	N′	$\langle e,p\rangle$	What is *x* like?	power
$sole_{R}$	(126)	N′	$\langle e,p\rangle$	Who is an *R* of *y*?	entailment
$exclusive_{R}$	(149)	N′	$\langle e,\langle e,p\rangle\rangle$	Who can have an *R*?	entailment
$exclusive_{\theta}$	(163)	N′	$\langle e,\langle e,p\rangle\rangle$	Who can be an *R*?	entailment
$exclusive_{V}$	(169)	N′	$\langle v,p\rangle$	What *X*'s *P*?	entailment

Table 1 Summary of exclusives discussed

We have been successful in our mission to the extent that taxonomizing in this way enables a succinct description of what the various English exclusives have in common, and how they differ. The applicability of our schema to such a broad range of lexical items could be taken to suggest that MAX and MIN are two members of a limited set of 'semantic primitives' made available by Universal Grammar, and that there is a limited set of possible word meanings involving them. This idea must be tested on a larger dataset. There are potential exclusives in English that we have not considered, such as *pure* and *very*, which overlap in function with some of the other exclusives we have discussed. This schema must be evaluated in light of exclusives in other languages as well. For example, the analysis of Orenstein & Greenberg (2010) suggests that Hebrew lexical items for which the closest translation equivalents in English are exclusives are not themselves exclusives according to our definition: should this be accepted, or should the schema be altered? To take another example, can our schema take into account *temporal* exclusives such as in German (König 1991) and Polish (Tomaszewicz 2012)?

Another general question is whether a development of our framework would enable a succinct description between the similarities and differences between exclusives and other types of particles that sometimes overlap in form and function with exclusives, such as exceptives like *but* and scalar additives like *even*. While this paper only scratches the surface of a much broader field of investigation, we hope to have developed some theoretical and empirical tools that may be applicable beyond what we have studied here.

Acknowledgements

Thanks to Walter Pedersen, Michael Wagner, Daniel Hole, Sebastian Löbner, Hana Filip, *Journal of Semantics* editor Jon Gajewski and three anonymous reviewers for feedback. This work was partly supported by the Swedish Research Council grant *Semantic Analysis of Interaction and Coordination in Dialogue*. Research at the University of Texas was supported by NSF grant BCS-0952862 *Semantics and Pragmatics of Projective Meaning across Languages*, as well as by NSF BCS-0904913, and DoD HHM402-10-C-0100.

ELIZABETH COPPOCK
University of Gothenburg
Department of Philosophy,
Linguistics and Theory of Science
Box 200
405 30 Gothenburg
Sweden
e-mail: eecoppock@gmail.com

DAVID BEAVER
Department of Linguistics
The University of Texas at Austin
CLA 4.708, Mailcode B5100
Austin, TX 78712
e-mail: dib@utexas.edu

REFERENCES

Atlas, J. (1993), 'The importance of being ''Only'': testing the neo-Gricean versus neo-entailment paradigms'. *Journal of Semantics* **10:**301–18.

Atlas, J. (1996), ''Only' noun phrases, pseudo-negative generalized quantifiers, negative polarity items, and monotonicity'. *Journal of Semantics* **13:**265–328.

Atlas, J. D. (1991), 'Topic/comment, presupposition, logical form and focus stress implicatures: The case of focal particles *only* and *also*'. *Journal of Semantics* **8:**127–147.

Beaver, D. (2004), 'Five 'only' pieces'. *Theoretical Linguistics* **30:**45–64.

Beaver, D. I. & B. Z. Clark. (2008), *Sense and Sensitivity: How Focus Determines Meaning*. Wiley-Blackwell. Chichester.

Biezma, M. (2011), 'Optatives: deriving desirability from scalar alternatives'. In I. Reich (ed.), *Proceedings of Sinn und Bedeutung 15*. Saarland Unversity Press. Saarbrücken, Germany. 117–32.

Bonomi, A. & P. Casalegno. (1993), '*Only*: association with focus in event

semantics'. *Natural Language Semantics* **2:**1–45.

Büring, D. (2008), 'The least *at least* can do'. In C. B. Chang & H. J. Haynie (eds.), *Proceedings of the 26th West Coast Conference on Formal Linguistics*. Cascadilla Press. Somerville, MA. 114–30.

Büring, D. & K. Hartman. (2001), 'the syntax and semantic of focus-sensitive Particles in German'. *Natural Language and Linguistic Theory* **19:**229–81.

Chierchia, G. (2006), 'Broaden your views: Implicatures of domain widening and the "logicality" of language'. *Linguistic Inquiry* **37:**535–90.

Chierchia, G., D. Fox & B. Spector. (2008), 'The grammatical view of scalar implicatures and the relationship between semantics and pragmatics'. In C. Maienborn, K. von Heusinger & P. Portner (eds.), *Semantics: An International Handbook of Natural Language Meaning*. Mouton de Gruyter. Berlin.

Coppock, E. & D. Beaver. (2011), 'Sole sisters'. In N. Ashton, A. Chereches & D. Lutz (eds.), *Proceedings of Semantics and Linguistic Theory (SALT) 21*. Rutgers University. 197–217 eLanguage.

Coppock, E. & D. Beaver. (2012a), 'Exclusive updates'. In M. Aloni, F. Roelofsen, G. W. Sassoon, V. K. Katrin Schulz & M. Westera (eds.), *18th Amsterdam Colloquium*. Springer. Berlin. 291–300.

Coppock, E. & D. Beaver. (2012b), 'Exclusivity, uniqueness, and definiteness'. In C. Piñón (ed.), *Empirical Issues in Syntax and Semantics 9*. Published online at http://www.cssp.cnrs.fr.

Coppock, E. & D. Beaver. (2012c), 'Weak uniqueness: The only difference between definites and indefinites'. In A. Chereches (ed.), *Proceedings of SALT 22*. 527–544 eLanguage.

Coppock, E. & D. Beaver. (2013), 'Mereology: toward a unified analysis of mere and other exclusives'. In A. Falaus (ed.), *Alternatives in Semantics*. Palgrave Macmillan. Basingstoke, UK.

Coppock, E. & T. Brochhagen. (to appear), 'Raising and resolving issues with scalar modifiers'. *Semantics & Pragmatics*.

Dretske, F. I. (1972), 'Contrastive statements'. *Philosophical Review* **81:** 411–37.

Fox, D. (2007), 'Free choice disjunction and the theory of scalar implicatures'. In U. Sauerland & P. Stateva (eds.), *Presupposition and Implicature in Compositional Semantics*. Palgrave Macmillan. New York. 71–120.

Gazdar, G. (1979), 'A solution to the projection problem'. In C.-K. Oh & D. Dineen (eds.), *Syntax and Semantics 11: Presupposition*. Academic Press. New York. 57–89.

Geurts, B. & R. van der Sandt. (2004), 'Interpreting focus'. *Theoretical Linguistics* **30:**1–44.

Giannakidou, A. (2006), '*Only*, emotive factive verbs, and the dual nature of polarity dependency'. *Language* **82:** 575–603.

Ginzburg, J. (1996), 'Interrogatives: questions, facts, and dialogue'. In S. Lappin (ed.), *The Handbook of Contemporary Semantic Theory*. Blackwell. Oxford. 385–422.

Groenendijk, J. & M Stokhof. (1984), 'Studies on the Semantics of Questions and the Pragmatics of Answers'. Ph.D. thesis. University of Amsterdam.

Grosz, P. (2012), *On the Grammar of Optative Constructions*. John Benjamins. Amsterdam/Philadelphia.

Guerzoni, E. (2003). 'Why Even Ask? On the pragmatics of questions and the semantics of answers'. Ph.D. thesis, MIT.

Hamblin, C. L. (1971), 'Mathematical models of dialogue'. *Theoria* **37:** 130–55.

Heim, I. (1983), 'On the projection problem for presuppositions'. In D. Flickinger, M. Barlow & M. Westcoat (eds.), *Proceedings of the Second West Coast Conferenceon Formal Linguistics*. Stanford University Press. Stanford, CA. 114–25.

Heim, I. (1991), 'Artikel und definitheit'. In A. von Stechow & D. Wunderlich (eds.), *Semantik: Ein internationales Handbuch der zeitgenössischen Forschung*. Mouton de Gruyter. Berlin. 487–535.

Heim, I. & A. Kratzer. (1998), *Semantics in Generative Grammar*. Blackwell. Oxford.

Herburger, E. (2000), *What Counts: Focus and Quantification*. MIT Press. Cambridge, MA.

Hole, D. (2004), *Focus and Background Marking in Mandarin Chinese: System and Theory behind cai, jiu, dou, and ye*. RoutledgeCurzon. London and New York.

Horn, L. R. (1969), 'A presuppositional analysis of *only* and *even*'. In R. I. Binnick, A. Davison, G. Green & J. Morgan (eds.), *Papers from the Fifth Regional Meeting of the Chicago Linguistic Society*. Chicago Linguistic Society. Chicago. 98–107.

Horn, L. R. (1970), 'Ain't it hard (anymore)'. In *Proceedings of the 6th Regional Meeting of the Chicago Linguistic Society*. Chicago Linguistic Society. Chicago.

Horn, L. R. (1996), 'Exclusive company: only and the dynamics of vertical inference'. *Journal of Semantics* **13:**1–40.

Horn, L. R. (2000), 'Pick a theory (not just any theory)'. In L. R. Horn & Y. Kato (eds.), *Negation and Polarity: Syntactic and Semantic Perspectives*. Oxford University Press. Oxford, UK. 147–92.

Horn, L. R. (2002), 'Assertoric inertia and NPI licensing'. *In Chicago Linguistic Society 38*. University of Chicago. 55–82.

Horn, L. R. (2009), *Scalar adverbs revisited*. In Almost et al. (eds.). MS., Yale University.

Horn, L. R. (2011), '*Only* XL: the assertoric asymmetry of exponibles'. In E. Cormany, S. Ito & D. Lutz (eds.), *Proceedings of Semantics and Linguistic Theory (SALT) 19*. CLC Publications. Ithaca, NY. 198–222.

Ippolito, M. (2008), 'On the meaning of *only*'. *Journal of Semantics* **25:**45–91.

Jacobs, J. (1983). *Fokus und Skalen*. Niemeyer, Tübingen.

Jäger, G. (1996), 'Only updates'. In P. Dekker & M. Stokhof (eds.), *Proceedings of the Tenth Amsterdam Colloquium*. ILLC, University of Amsterdam. Amsterdam.

Karttunen, L. (1973), 'Presuppositions of compound sentences'. *Linguistic Inquiry* **4:**169–93.

Karttunen, L. (1974), 'Presuppositions and linguistic context'. *Theoretical Linguistics* **1:**181–94.

Karttunen, L. & S. Peters. (1979), 'Conventional implicatures'. In C.-K. Oh & D. A. Dinneen (eds.), *Presuppositions, volume 11 of Syntax and Semantics*. Academic Press. New York.

Kennedy, C. (2012), 'A scalar semantics for scalar readings of number words'. *Semantics Archive*.

Klinedinst, N. (2004). Scales and *only*. UCLA Master's Thesis.

Klinedinst, N. (2005). Bargains, scales and *only*. Paper presented at NELS 36.

König, E. (1991), *The Meaning of Focus Particles*. Routledge. London.

Krifka, M. (1992), 'A compositional semantics for multiple focus constructions'. In J. Jacobs (ed.), *Informationsstruktur und Grammatik*. Westdeutscher Verlag. Opladen. 17–54.

Krifka, M. (1993), 'Focus and presupposition in dynamic interpretation'. *Journal of Semantics* **10:**269–300.

Krifka, M. (1999), 'At least some determiners aren't determiners'. In K. Turner (ed.), *The Semantics/Pragmatics Interface from Different Points of View*. Elsevier. Oxford. 257–91.

Link, G. (1983), 'The logical analysis of plurals and mass terms: A lattice-theoretical approach'. In R. Bäuerle, C. Schwartze & A. von Stechow (eds.), *Meaning, Use, and the Interpretation of Language*. Walter de Gruyter. Berlin. 302–23.

McCawley, J. D. (1981), *Everything that Linguists have Always Wanted to Know about Logic but Were Ashamed to Ask*. University of Chicago Press. Chicago.

Moltmann, F. (2004), 'The semantics of together'. *Natural Language Semantics* **12:**289–318.

Orenstein, D. & Y. Greenberg. (2010), 'The semantics and focus sensitivity'. Paper presented at IATL 26. Bar Ilan University.

Partee, B. (1983/1997), 'Uniformity vs. versatility: the genitive, a case study, appendix to T. Janssen (1997) ''compositionality'''. In J. van Benthem & A. ter Meulen (eds.), *The Handbook of Logic and Language*. Elsevier. Amsterdam.

Partee, B. & V. Borschev. (2003), 'Genitives, relational nouns, and argumentmodifier ambiguity'. In E Lang, C. Maienborn & C. Fabricius-Hansen (eds.), *Modifying Adjuncts*. Mouton de Gruyter. Berlin. 67–112.

Partee, B. H. (1986), 'Noun phrase interpretation and type-shifting principles'. In J. Groenendijk, D. de Jongh & M. Stokhof (eds.), *Studies in Discourse Representation Theory and the Theory of Generalized Quantifiers*. Foris. Dordrecht. 115–43.

Partee, B. H. (1999), 'Weak nps in have sentences'. In J. Gerbrandy, M. Marx, M. de Rijke & Y. Venema (eds.), *JFAK – Essays Dedicated to Johan van Benthem on the Occasion of his 50th Birthday*. University of Amsterdam.

Potts, C. (2005), *The Logic of Conventional Implicatures*. Oxford University Press. Oxford, UK.

Riester, A. (2006), 'Only scalar'. *Proceedings of the 11th ESSLLI Student Session*. Janneke Huitink and Sophia Katrenko. 64–75.

Rifkin, J. I. (2000), 'If only *if only* were *if* plus *only*'. In J. P. Boyle (ed.), *Papers from the 36th Regional Meeting of the Chicago Linguistic Society*. Chicago Linguistic Society. 369–84.

Roberts, C. (1996), 'Information structure in discourse: Towards an integrated formal theory of pragmatics'. In J.-H. Yoon & A. Kathol (eds.), *OSU Working Papers in Linguistics 49: Papers in Semantics*. The Ohio State University. Columbus.

Roberts, C. (2006), '*Only* and conventional presupposition'. MS. The Ohio State University.

Roberts, C., M. Simons, D. Beaver & J. Tonhauser. (2009), 'Presupposition, conventional implicature, and beyond: A unified account of projection'. In N. Klinedinst & D. Rothschild (eds.), *Proceedings of New Directions in the Theory of Presupposition*. ESSLLI. Toulouse, France.

Rooth, M. (1985), *Association with Focus*. Ph.D. thesis. University of Massachusetts at Amherst.

Rooth, M. (1992), 'A theory of focus interpretation'. *Natural Language Semantics* **1:**75–116.

Schlenker, P. (2011), Maximize Presupposition and Gricean reasoning. MS., UCLA and Institut Jean-Nicod.

Schwarzschild, R. (1997). Why some foci must associate. Unpublished MS.

Simons, M., D. Beaver, J. Tonhauser & C. Roberts. (2010), 'What projects and why'. *Proceedings of SALT 20*. 309–327.

Taglicht, J. (1984), *Message and Emphasis*. Longman. New York.

Tomaszewicz, B. (2012), A family of exclusives in Polish. GLOW 35 Association with Focus Workshop. University of Potsdam. Germany 03/31/2012.

van der Sandt, R. A. (1992), 'Presupposition projection as anaphora resolution'. *Journal of Semantics* **9:**333–377.

van Rooij, R. (2002), 'Relevance only'. In J. Bos, M. E. Foster & C. Matheson (eds.), *Proceedings of the Sixth Workshop on the Semantics and Pragmatics of Dialogue (EDILOG 2002)*. 155–60.

van Rooij, R. & K. Schulz. (2003), 'Exhaustification'. In H. Bunt, I. van der Sluis & R. Morante (eds.), *Proceedings of the Fifth International Workshop on Computational Semantics*. University of Tilburg. Tilburg. 354–98.

van Rooij, R. & K. Schulz. (2007), *Only: Meaning and implicature*. In M. Aloni, A. Butler & P. Dekker (eds.), Questions in Dynamic Semantics. Elsevier. Amsterdam. 193–224.

von Fintel, K. (1997), 'Bare plurals, bare conditionals, and *only*'. *Journal of Semantics* **14:**1–56.

von Fintel, K. (1999), 'NPI licensing, Strawson entailment, and context dependency'. *Journal of Semantics* **16:**97–148.

von Stechow, A. (1991), 'Focusing and background operators'. In W. Araba (ed.), *Discourse Particles*. John Benjamins. Amsterdam. 37–840.

Wagner, M. (2005), 'NPI licensing and focus movement'. In E. Georgala & J. Howell (eds.), *Proceedings of Semantics and Linguistics Theory (SALT) XV*. CLC Publications. Ithaca, NY.

First version received: 15.07.2012
Second version received: 04.05.2013
Accepted: 23.05.2013