only: A Case Study In Projective Meaning

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ABSTRACT: I offer an integrated theory of the meaning of *only* in which the prejacent, while not presupposed, is both entailed and backgrounded, hence tends to project (following a general proposal about projection due to Simons et al. 2010). Moreover, I argue, contra Beaver & Brady (2008), that *only* is not conventionally associated with focus, the focus effects arising instead pragmatically. But I do adopt aspects of their semantics for *only*, including the presupposition of a pre-order over the elements of its domain.

1.   TWO PUZZLES ABOUT *ONLY*

It's amazing how much you can learn about natural language meaning from the careful study of one little word. English *only* is one of those. It is clear that the meaning of an utterance like *John only swims (NP only VP)* typically involves at least the following two implications:

(1)   John only swims
the **prejacent implication**: VP′(NP′)   'John swims'
the **exclusive implication**: ¬∃P: P(j) & P ≠ VP′   'John has no
property but swimming'

Zeevat (2002) and Beaver & Brady (2008) point to another possible implication:
        the **mirative implication**: the prejacent falls short of what one
                                            might have expected to be the case

In (1), one might have expected that John had other relevant properties besides swimming.

only is cross-categorial, modifying a variety of types of constituents. But the same pattern emerges across its uses. Here is NP-*only*:

(2)   Only John swims.
prejacent implication: VP′(NP′)   'John swims'
exclusive implication: ¬∃VP′(x) & x ≠ NP′   'No one other than
                                                                John swims'
mirative implication: 'One might have expected
                                                others besides John to swim'

Over the past 40 years, two puzzles about the meaning of only have received considerable attention, one pertaining to each of these implications in (1):

With respect to the prejacent, what kind of meaning is this? Contemporary authors, beginning with Horn (1969), have proposed a variety of theories about the meaning of *only*, and in particular about the way in which the prejacent contributes to that meaning. Proposals about the status of the prejacent include the following:

- entailment: (Atlas 1993)

- conventional presupposition: (Horn 1969; Rooth 1985, 1992)

- derived from a conventional presupposition of existence by abstracting on the focus: (Horn 1996; von Fintel 1997); e.g. for subject focus this is: ∃x:VP(x), so for (2): *Someone swims*.

- conversational implicature derived from the exclusive implication: (McCawley 1981:226-7; van Rooij & Schulz 2007): For (1), if the speaker had reason to believe that John doesn't swim, then in order to be maximally cooperative (under Grice's first

Maxim of Quantity) she should have proffered the stronger *Nobody swims*.

Variant due to Ippolito (2008): the prejacent is a scalar implicature of positive only sentences like (2), but an entailment of its negated counterpart *Not only John swims*.

- projective but not *pre*supposed: (Roberts 2006); more below.

- entailment of a presupposed mirative implication and the proffered exclusive in certain contexts: (Beaver & Brady 2008). See section 4.1 below.

With respect to the exclusive implication, the domain of the quantificational operator in its logical form is usually restricted to some salient set of entities of the appropriate type. And in utterance tokens involving *only*, we typically gather clues about the domain intended by the speaker from the prosodic contour of the utterance. Hence the different domains for *only* in utterances like the following, leading to truth-conditionally distinct exclusive implications:

(3)   John only introduced Sue to Bill
         John only introduced SUE to Bill.   'John doesn't have any
                                             property of the form *introduced*
                                 x to Bill other than that of introducing Sue to Bill'
         John only introduced Sue to BILL   'John doesn't have any
                                             property of the form *introduced*
                                 Sue to x other than that of introducing Sue to Bill'

This phenomenon is called *association with focus* (Jackendoff 1972). The puzzle about the exclusive implication pertains to the source of this restriction: Is the conventional meaning of *only* explicitly sensitive to the prosodic focal structure of its complement constituent (Jackendoff 1972; Rooth 1985; Beaver & Brady 2008), or is the relationship indirect (Rooth 1992; Roberts 1996a)?

In this essay, I will initially focus on the status of the prejacent implication, which necessitates as well a careful reconsideration of the logical form of the exclusive implication. Then at the end I will address the question of focus-sensitivity, and that of the relationship between the two implications. Beaver & Clark (2008:250) claim that theirs "is the theory of exclusives that Roberts (1996a) and Roberts (2006) would

have written if they had ever coauthored a paper." Here I will sketch the theory that Beaver & Brady (2008) and Roberts (1996a, 2006) would have written if they had ever coauthored a paper with Kadmon & Sevi (this volume) under the influence of the on-going work on projective meaning reported in Roberts et al. (2009) and Simons et al. (2010).

The basis of both prongs of this attack on *only* is a formal theory of the notion of context of utterance due to Roberts (1996a), effectively an alternative pragmatics, and on a theory of projective meaning (Roberts et al. 2009; Simons et al. 2010) based on that work. In the next section, I'll quickly sketch this theory as background. In section 3 we'll discuss which of the properties of projective meanings considered in section 2 pertain to the prejacent of *only*, and compare it in these respects to the polar implications of approximatives like *almost* and *barely*. And in section 4, after considering Beaver & Clark's (2008) theory of *only*, I'll propose a modification of their theory which takes into account the properties of the prejacent discussed in section 3 and makes do without conventional association with focus.

2.   BACKGROUND: PROJECTIVE MEANING

Semantic content **projects** if it contributes content at a non-local level despite being embedded under an operator that might be expected to block inferences from material in its scope. There is, of course, a very long literature in linguistics investigating what projects and why. Projection has generally been taken to be the hallmark of material which is presupposed. But several authors have noted that not all that projects is presupposed (Chierchia & McConnell-Ginet 1990; Potts 2005, among others), and recently, Roberts et al. (2009) and Simons et al. (2010) have argued that we need a more general theory of projection, which subsumes non-presuppositional projection and also considers projection across a wide range of languages (Tonhauser et al. 2011). Informally, our[1] proposal is that semantic content projects when it is **not at-issue** in the discourse context, since operators target at-issue meaning. Here, I briefly sketch the arguments for that proposal.

Most of the work on projection has focused on presupposition projection. In English, this is triggered by a wide variety of lexical items,

including definite noun phrases, factive verbs (*know, realize*) and nouns
(*realization*), telic and implicative verbs (*stop, manage*); and adverbs
like too and again, among many others. Something comparable is seen
in Guaraní, a Tupí-Guaraní language spoken in Paraguay (the following
based on fieldwork by Judith Tonhauser):

(4)   Cárla o-heja la   jepita.
        Carla 3-stop the smoke
        'Carla stopped smoking.'

(5)   Cárla nd-o-hejá-i   la   jepita.
        Carla NEG-3-stop-NEG the smoke
        'Carla didn't stop smoking.'

(6)   I-katu   Cárla o-heja la   jepita.
        3-possible Carla 3-stop the smoke
        'It's possible that Carla stopped smoking.'

(4) implies that Cárla has been a smoker, and that she has stopped.
In (5), the verb *o-heja* is under the scope of negation, and the utter-
ance fails to entail that Cárla has stopped smoking; yet it still implies
that she has been a smoker; hence, we say that the latter implication
projects. The same pattern emerges in (6), with (4) under the scope of
a possibility operator, which also implies that Cárla has been a smoker
but fails to entail that she is not smoking anymore. Hence, the Guaraní
verb *heja* appears to presuppose that the subject has engaged in the
past in the activity denoted by its VP complement, like its counterpart
stop in English, and this presupposition is reflected in projection.

But not all that projects is presupposed. Chierchia & McConnell-
Ginet (1990) pointed out that English non-restrictive relative clauses
do project, quite robustly, but do not seem to be presupposed. We see
this in examples from English and Guaraní:

(7)   Sweden may export synthetic wolf urine—sprayed along roads
        to keep elk away—to Kuwait for use against camels. (Associ-
        ated Press, January 19, 1995, reported in Beaver 2001)

(8)   Maléna, ha'é-va   Juan angiru, nd-o-hó-i   Caaguasú-pe.
        Malena 3.pron-RC Juan friend   NEG-3-go-NEG Caaguasu-to
        'Malena, who is Juan's friend, did not go to Caaguasu.'
             Implies: Malena is Juan's friend.

Moreover, Potts (2005) brought to light a large class of triggers of what
he calls *conventional implicature*, all of which project without being
presuppositional in the classic sense of putting a felicity constraint on
prior context. Besides non-restrictive relatives and appositives, these
include politeness morphemes, as in (9) where use of *vous* uncondi-
tionally implicates that the speaker is in a deferential position with
respect to the addressee, and a variety of expressives like the epithet
in (10), which implicates that the speaker—and not the Democrats
themselves—thinks the Democrats' proposals for reform are stupid:

(9)   Si vous voulez, nous pouvons parler.
        'If you (formal) wish, we can talk.'
             Implies: speaker is in a deferential position with respect to
        the addressee

(10)   Every Democrat advocating [a proposal for reform]$_1$ says
        [the stupid thing]$_1$ is worthwhile.   (Potts 2005)
             Implies: speaker thinks the Democrats' proposals are stupid

The question we posed ourselves is whether there might be a uniform
explanation for projection: Why does projection happen? In exploring
this question, we noted a number of features of projective meanings,
which we took to be clues to this explanation. These features are un-
explained by the classical accounts of presupposition projection.

2.1.   Puzzles about projection

Puzzle 1: Projective meanings are not targeted by affirmations and de-
nials.

We see this in (11):

(11)   A: Bo has stopped drinking beer for breakfast.
        B: Yes. / That's right.
        B': No. / That's not true.

Direct affirmation or denial by B targets A's claim that Bo has stopped
his behavior, not the implication that he has been drinking beer at
breakfast.

Puzzle 2: Projective material is typically not acceptable as the answer to a question.

We see this in (12), where the non-restrictive relative clause cannot by itself be felicitously used to answer A's question, even though it does in fact address that question, and in (13), where the epithet SOB cannot by itself answer the question of what A thinks about Bob, though its use entails that the speaker has a poor opinion of Bob.

(12)   A: Where's Bob these days?
         B: #Bob, who is in Austin, hasn't called me for a week.
         B': Bob, who called me yesterday, is in Austin.

(13)   A: What do you think of Bob?
         B: #That SOB Bob is dating my sister.

Puzzle 3: Things that usually trigger projection sometimes fail to do so.

We see this with a wide variety of triggers, and the variation in their projectivity involves several superficially different factors, as illustrated by:

Factive nouns and prosodic focus:

(14)   This time our defeat wasn't caused by HARRY. ([Hajičová 1984](#))

(15)   This time Harry didn't cause our DEFEAT.

In (14), our defeat triggers the implication that a group including the speaker was defeated, an implication which projects, escaping the scope of the negation. But Hajičová observes that in (15), putting nuclear accent on defeat seems to prevent that projection, so that the implication does not persist.

Semifactives and the first person, plus focus: [Karttunen](#) ([1971](#)) observed that some factive verbs, like *realize*, which normally trigger the projective implication that their complement clause is true, as in (16), may fail to do so if the subject is first person, as in (17). Note that the

implication may persist despite the first person subject if the verb itself is focused, as in (18), which accordingly is infelicitous because the factive implication on the part of the speaker is inconsistent with the possibility that the antecedent may, for all the speaker knows, not be true.

(16)   If John realizes later that I have not told the truth, I will confess it to everyone.

(17)   If I realize later that I have not told the truth, I will confess it to everyone.

(18)   #If I REALIZE later that I have not told the truth, I will confess it to everyone.

Finally, in (19), with accent on *water*, there is a factive implication, but not the classical presupposition of the complement clause—the speaker presumes that it's true that something will be discovered on Mars, but not necessarily that water will be discovered.

(19)   If scientists discover that there's WATER on Mars, we can start a colony

Definite descriptions and the question under discussion:

The existence implication associated with a definite description strongly tends to project, as we see in (20), where A's reply implicates that there is a King of France, asserting that he wasn't at the wedding. But in (21), where the question itself is *whether* there is a King of France, use of the NP *the King of France* in A's reply does not project. Instead, A asserts that it's not the case that there is a King of France who was at the wedding, implicating that for all she knows there is no such person.

(20)   Q: Which monarchs attended the Swedish wedding last year?
         A: The king of France wasn't there.

(21)   Q: Does France have a king?
         A: The king of France wasn't one of the guests at the Swedish wedding last year.

Presupposition-triggering verbs and the question under discussion:

In (22), *win* triggers the implication that the denotation of its subject, Bill, will run for election, which projects over negation. But in (23), where the question is whether Bill will run, this implication does not arise; instead, A asserts that if Bill were to run, he wouldn't win.

(22)   Q: How do you expect the election to go?
        A: Well, Bill certainly won't win.

(23)   Q: Will Bill run in the election?
        A: He won't win.
                'If he runs, he won't win.'

Puzzle 4: Sometimes there's projection when you might not expect it.

Abbott (2000) observes that manner adverbs may trigger projection. In (24), we tend to take the speaker to implicate that Hans did nod, and only conditionally entertain the possibility that he nodded *slowly*:

(24)   If Hans nodded slowly, he's not in full agreement.   (Beaver 2010)

We relate Abbott's observation to the old observation that non-focused material projects. For example:

(25)   Paula isn't registered in PARIS   (Kratzer 1989)

(26)   PAULA isn't registered in Paris.

(25) means, roughly, that it is not in Paris that Paula is registered, implicating that she's registered somewhere, while the string-identical (26) means that it isn't Paula who is registered in Paris, implicating that someone is.

    The default way of reading (24) when presented, as it is by Abbott, out of the blue, is with focus on *slowly*. But if we move that focus to *nodded*, we lose the implication that Hans nodded. Many other authors have discussed presuppositions of focus, e.g. citetgeurts04, but why does backgrounded material tend to project?

2.2.   Not-at-issueness and projective meaning

Previous approaches to projective behavior fall into one of three general types:

- Common ground approaches (Stalnaker 1973; 1974; Karttunen 1974; Lewis 1969; Heim 1983) focus on triggers for presupposition projection, taking them to impose a felicity constraint on the local context of utterance: Basically, what is presupposed should be taken for granted, or entailed by the interlocutors' common ground, imposing thereby a felicity constraint on contexts of utterance.

- Anaphora approaches (van der Sandt 1992, Geurts (1999)) to presupposition projection go further, and require that a projective meaning have an anaphoric antecedent in prior discourse, in Discourse Representation Structure.

- Multi-dimensional approaches (Karttunen & Peters 1979; Potts 2005) assume that projective meanings are calculated compositionally, simultaneously with but independent from the compositional calculation of the truth conditional, non-projective meaning of the utterance.

All of these approaches assume that projective behavior is conventionally triggered, by some word or construction in the utterance. Hence, puzzles 1 and 2 are problematic for all of them, since the data appear to suggest that projection is partly a function of the *context of utterance*, and moreover, of aspects of that context not taken into account in the theories in question. Puzzles 3 and 4 are also problematic for all of these approaches, since if projection is conventionally triggered, we would expect that it would either always arise, or never arise, in conjunction with the conventional content of a particular word or expression.

    There are a number of observations in the literature on the status of presuppositions which suggest another way one might approach these phenomena (our emphasis):

> "Presuppositions . . . are something like the **background beliefs** of the speaker – propositions whose truth he takes for

granted, or seems to take for granted, in making his statement." (Stalnaker 1974: 198)

"...a presupposition is a proposition that is conveyed by a sentence or utterance but is **not part of the main point**..." (Horton & Hirst 1988: 255)

"To presuppose something is **to take it for granted in a way that contrasts with asserting it**." (Soames 1989: 553)

"([A]n utterance of) a sentence S presupposes a proposition p if (the utterance of) S implies p and further implies that p is somehow already part of the background against which S is considered, that **considering S at all involves taking p for granted**." (Chierchia & McConnell-Ginet 1990: 280)

"...what is **asserted** is what is presented as **the main point of the utterance** — what the speaker is going on record as contributing to the discourse. [...] Anything else will have to be expressed in another way, typically by being presupposed." (Abbott 2000: 1431f.)

"The content of appositives and expressives is not **at-issue ('what is said')**" (Potts to appear)

Here is what we have proposed in the work cited above:

Hypotheses about **Projective Meaning**:

- All and only those implications of (embedded) S which are **not at issue relative to the Question Under Discussion in the context (QUD)** have the potential to project.

- Operators (modals, negation, etc.) target at-issue content.

The **Question under Discussion**:

- Basic idea (cf. Roberts 1996a/to appear): QUD is what fixes the current discourse topic and thereby imposes relevance constraints on subsequent discourse contribution(s).

- A question is modeled as an alternative set: those propositions which are possible answers to the question.

- Once a question is under discussion, it remains so until it has been answered or determined to be practically unanswerable (resolved).

- Relevance requires addressing the QUD, i.e. making a discourse move that contributes to its resolution.

Our approach to understanding what it is to be at-issue arises from the intuition that at-issue content must address the QUD. Accordingly, here is a first pass at defining this notion:

(27)   At-issueness, preliminary definition:
- Proposition p is **at-issue** iff *the question whether p (?p) is* **relevant to the QUD**.
- *?p* is **relevant to the QUD** iff it has an answer which **contextually entails a (partial or complete) answer to the QUD**. (Roberts 1996a)

This generalization makes some nice predictions. For example, consider the behavior in discourse of citetpotts05 supplemental Conventional Implicature (CI) triggers, which include non-restrictive relative clauses (NRRCs) and appositives. He argues that CIs always project to the global level.[2] Amaral et al. (2008) point out that utterances containing CIs, like those in Potts' (28),[3] differ in felicity as a function of context. For example, (28b) but not (28a) would be a felicitous reply to the question *Who is Edward Witten?*:

(28)   a.   A former linguist, Edward Witten, is now the top-dog in string theory.
         b.   Edward Witten, a former linguist, is now the top-dog in string theory.

(Potts 2005:137)

It seems that in such utterances the main clause content must address the QUD. The main clause in (28a) does not, leading to infelicity. But the appositive CI needn't be relevant, as we see in (28b), and moreover its relevance in (28a) does not save felicity.

However, there is a difficulty with the definition in (27): In some cases, projective implications may be relevant in the technical sense just noted—addressing the overt question just posed. Consider (29):

(29)   [Context: A working group meeting in Berlin.]
        Q: Where's Bob?
        A: Bob, who's at a meeting this morning in Potsdam, can't join us.

In (29A), the NRRC entails an answer to the QUD (29Q). Yet this same NRRC is clearly projective, as we see in (30):

(30)   Q: Where's Bob?
        A: If Bob, who's at a meeting this morning in Potsdam, doesn't catch the noon train, he'll miss this afternoon's meeting as well.

In (30), though the NRRC is embedded in the antecedent of a conditional, it projects, so that the speaker is committed to the truth of the proposition that Bob's in Potsdam. Moreover, it has no local effect, in the sense that the truth of the consequent *he'll miss this afternoon's meeting* is not conditional on Bob's being in Potsdam. But the NRRC is still at-issue in the sense defined in (27). And both (29) and (30) seem relatively felicitous.

There is a good deal to say about the felicity of such examples. For one thing, in each the main clause arguably does *not* address the overt question Q. (29A) addresses the larger issue of whether Bob will be attending the meeting; (30A) addresses the larger issue of whether Bob will be participating in the day's events. So in each, the speaker has changed the subject to address what she takes to be the real questions of interest, given the interlocutors' overarching purposes: Why isn't Bob here (when presumably he should be)?, Will he join us?, etc.[4] If the original questioner accepts A's agenda, then she will accommodate this larger intentional structure as part of a more elaborate strategy of inquiry and accept A's reply as felicitous. In that case, the real main point has been addressed in an assertion, and the backgrounding of the overt Q, and the response to it in A, is acceptable.

The shift in the question addressed in these examples seems necessary for their felicity; otherwise, without a plausible shift in strategy of

inquiry, irrelevance of the main clause is infelicitous and relevance of the NRRC is at best supplemental and at worst redundant. For example, I find (27A) clearly more felicitous as a reply to (29A) than (31A):

(31)   Q: Where's Bob?
        A: Bob, who's at a meeting this morning in Potsdam, isn't here.

Presumably this is because the main clause in (31A) is simply entailed by the NRRC, so seems redundant. Hence, in the felicitous examples (29) and (30), the felicity depends on the implicit shift in QUD discussed above. This argues that in the interest of felicity it would be unreasonable for the speaker to intend that an NRRC be taken as that portion of the utterance which addresses the QUD.

Nonetheless, for the purposes of determining the suitability of (27), these examples show that that definition is off-base. Even though the NRRC addresses the overt QUD, and so is at-issue under the definition, it projects. The problem is that (27) reduces what it is to be at-issue to what it is to be relevant, i.e. to address a QUD. The latter is merely a requirement that a certain logical relation obtain between the answer (in context) and the QUD. But at-issueness is more than that; it involves how the speaker intends her utterance to contribute to the flow of conversation and in particular to the achievement of the goals which define and constrain that flow. Relevance is just a constraint on such intentions, not its essential character. And given that some triggers and constructions, like the CIs, appear to be by their nature not amenable to directly achieving the stated discourse goals, it would be unreasonable for a competent speaker to intend the use of a CI in her utterance to do so, relevance notwithstanding.

Simons et al. (2010) resolve the problem with (27) by invoking reasonable speaker intention:

(32)   **At-issueness: definition**
        1. A proposition *p* is at-issue iff the speaker intends to address the QUD via *?p*.
        2. An intention to address the QUD via *?p* is **felicitous** only if:
        – *?p* is **relevant** to the QUD (i.e. contextually entails a partial answer)

– the speaker can reasonably expect the addressee to recognize this intention

Speaker intention is what determines at-issue status; but the relevance constraint limits these intentions. We presume that linguistic cues, like those associated with the CIs, affect what it is for such intentions to be reasonable.

Arguing in detail for this approach to projection is beyond the purview of the present paper. But to give a feeling for how the theory predicts projection, consider the following:

(33)   [Background scenario: a nutritionist has been visiting first grade classrooms to talk to the children about healthy eating.]
Q: What most surprised you about the first graders?
A: They didn't know that you can eat raw vegetables.

The negated (33A) involves at least the following two implications: p = 'one can eat raw vegetables', and q = 'the children knew p'. Which are understood to be negated? We consider which of these implications involved are (not)-at-issue.

Implication 1: *one can eat raw vegetables* = p

- $?p$ [the question whether p] has no answer which contextually entails an answer to the QUD (33Q).
- So $?p$ is not relevant to the QUD.
- Hence speaker cannot felicitously intend to address the QUD via $?p$.
- Hence p is not at issue (NAI), and (by hypothesis) can project.

Implication 2: *The children knew that one can eat raw vegetables* = q

- $?q$ [the question whether q] has an answer (i.e. the assertion $\neg q$) which contextually entails an answer to the QUD.
- Hence $?q$ is relevant to the QUD.

- So it's reasonable to presume the speaker intends to address the QUD via $?q$, hence q is at-issue.
- Hence, q is targeted by negation.

This seems to predict the understood interpretation of (33).

2.3.   Resolving the puzzles

The proposal just sketched offers insight into the puzzles considered earlier.

Puzzle 1: Projective meanings are not targeted by affirmations and denials.

Simple assertions and denials constitute the speaker's response to what has been asserted, asked, or suggested—themselves intended to address a QUD. As such, they target at-issue content. It is the at-issue content of an utterance which is proffered (Roberts 1996a)—in an indicative the at-issue content is canonically asserted; in an interrogative it is the question proposed for discussion; in an imperative, it is the suggestion made to the addressee. What we proffer is subject to acceptance or rejection. But NAI content is not asserted or asked or suggested—it is merely presumed to be true by the speaker. Note, however, that being presumed true by the speaker does not mean that the NAI content is necessarily presupposed in the sense of being assumed to be already entailed by the interlocutors' common ground. Rather, it just means that the speaker takes it for granted.

Puzzle 2: The fact that projective material doesn't usually answer questions also follows immediately.

As noted, there are examples which appear to challenge this generalization, including (29) and (30) above. But I argued that in those cases, the challenge was only apparent, as the response was intended to address a different question than the one overtly asked. Here is another challenging example, due to Chris Barker (p.c.):

(34)   Q: What do you think of Bill?

A: I've never met the son-of-a-bitch.   [cf. (12) above]

Again, the content of (34A) apart from the CI epithet *son-of-a-bitch* does not directly address (34A). Instead, in saying that he hasn't met Bill, the speaker implicates perhaps that he might not have adequate grounds for an opinion. But in simultaneously calling Bill a son-of-a-bitch, the speaker indicates that he has a low opinion of Bill. Because of this, one might take (34A) as a kind of joke, a pragmatic contradiction. In any case, the fact that the implication triggered by the epithet entails an answer to (34Q) does not mean that it is intended by the speaker as the *at-issue* response to that question. For example, one cannot respond to (34A) with *No!* or *That's false*, unless one is challenging the claim that the speaker has never met Bill. Again, this is the difference between being *relevant*—entailing a partial answer to the QUD—and being *at-issue*, which requires not only relevance, but being on-offer for acceptance or rejection. Epithets, like NRRCs, are conventional asides—contributions presumed true by the speaker without contributing directly to the flow of conversation according to the rules of the language game. Hence, it would be unreasonable for a speaker to intend for the addressee to take them to be at-issue. One more or less has to stop the discourse—as in the *Hey! Wait a minute!* response-in order to address NAI content.

Puzzle 3: Things that usually trigger projection sometimes fail to do so.

In (15) and (19), accent on a constituent implicates that it is only one possible value of several under consideration (Rooth 1992); this over-rides the tendency of factives to indicate that the complement is presumed to be true by the speaker, i.e. NAI. In (21) and (23), the projective implication often triggered by *the* or *win* is what's explicitly at-issue, so taking them to be NAI would yield a pragmatic contradiction. Hence, they do not project.

(15) This time Harry didn't cause our DEFEAT.

(19) If scientists discover that there's WATER on Mars, we can start a
      colony.

(21) Q: Does France have a king?

A: The king of France wasn't one of the guests at the Swedish wedding last year.

(23) Q: Will Bill run in the election?
      A: He won't win.

In all of these, then, failure to project coincides exactly with at-issueness. There's no need to stipulate a distinct class of allegations (Hajičová 1984) or a lexical class of semifactives (Karttunen 1971; see Simons 2000); to stipulate that implicatures are stronger than presuppositions (Gazdar 1979); or that focused presuppositions are locally accommodated (Partee 1996). Instead, the implications in these examples are local entailments that tend to be backgrounded, hence taken for granted, hence project. But when they're at-issue, they aren't taken for granted, hence don't project.

The ways in which these backgrounded implications regularly arise are varied, arguably a function of the particular content of the different triggers, be they lexical, prosodic or structural. It is important to note that cross-linguistically the implications in question strongly tend to be nondetachable and to recur with translation equivalents of lexical items that are triggers in other languages; see Simons (2000) on nondetachability and cross-linguistic evidence in factives and change of state predicates, Tonhauser et al. (2011) for detailed empirical investigation of projective triggers in Guaran?. This evidence argues that these implications do not always arise conventionally (in the sense of Lewis 1969), but as a function of the meaning and/or use of the triggers in question.

Puzzle 4: Sometimes there's projection when you might not expect it.

We take all the relevant cases here (including (24), (25) and (26) above) to involve prosodic focal structure triggering projection. This obviously follows from the one stipulation we've made, i.e. that NAI material tends to project, plus the claim that focus marks the answer to the QUD (Roberts 1996a, Beaver & Brady 2008), and everything else is by default NAI.

2.4. *Types of projective meaning*

Our goal in this project is to develop a unified account of projection for all instances of projective content. An enormous range of expressions *project*, including the usual presupposition triggers, Potts' (2005) CI triggers, and expressions producing *background implicatures* (Thomason 1990). In work in progress (Roberts et al. 2009; Tonhauser et al. (2011)), we show how a range of diagnostic tests supports both a uniform theoretical explanation for projection, and a motivated taxonomy of projective meaning types. The tests are grouped on the basis of the property they diagnose.

In what follows, m is the implication triggered by the expression under study. Take the notion of *global context* to be as in Heim (1982,1983)—which is to say, something like the interlocutors' Common Ground. As in Heim, the *local context* for the interpretation of an expression may be the same as the global context, or in case the trigger is embedded under the scope of an operator, the two may be distinct. For example, if m is triggered in the main clause of a conditional, the local context will be the hypothetical context wherein the antecedent of the conditional is taken to be true, under the scope of the explicit or implicit operator restricted by that antecedent (Kratzer 1980, Heim 1982).

Properties observed in various kinds of projective meanings:[5]

These properties are useful in distinguishing some important classes of projective meanings:

> I. <u>Projectivity</u> (Does m ever project, without prosodic deaccentuation?)
> II. <u>Direct Relevance</u>[6] (Can m be taken to directly address the question under discussion? Can an addressee directly affirm or deny the truth of m?)
> III. <u>Contextual Felicity</u> (Does use of the trigger impose a felicity condition on the prior context of utterance?)
> IV. <u>Local Effect</u> (Does use of the trigger always contribute to the local content of the utterance, even when m projects?)

These should be understood as descriptive properties. For example, in saying that an implication is projective in the absence of prosodic

deaccentuation, we do not prejudge whether the projectivity *per se* is a conventional feature of its meaning. And these properties are in principle independent of each other: If m always has a local effect, this does not preclude its being projective, or even carrying a contextual felicity condition. We see this in anaphora. An anaphoric expression is one which requires prior information in the interlocutors' common context in order to determine its intended contribution to the meaning of the clause in which it occurs—hence it not only has a contextual felicity condition, but carries a local effect. But it needn't project: The felicity condition needn't be satisfied by the global context, as we see in donkey sentences or modal subordination (Kamp 1981, Heim 1982, Roberts 1989,1996b):

(35)   If you spot <u>a sea eagle</u>, take a picture of <u>it</u>!
       If not, just enjoy the scenery.

(36)   Laura expected to see <u>a sea eagle</u> off the coast of Norway.
       She wanted to take a <u>picture of it</u> to show her friends.
       Unfortunately, the weather was dreadful, and she saw only low clouds and mist.

In (35), *it* triggers an anaphoric felicity condition, but that is satisfied under the scope of the conditional. In (79), the anaphora is resolved in the second sentence via the conditional assumption (narrow scope with respect to *want*) that Laura's desire, expressed in the first sentence and entailing the existence of a sea eagle, is satisfied. In both cases, the fact that this is mere local satisfaction of the anaphoric presupposition is reflected in the fact that they can be followed with global denial of the existence implication associated with a pronoun. This is contrasted with Potts' (2005) CI triggers, which, as discussed above, seem to always project and have no local effect, but also put no contextual felicity constraints on prior context (other than those associated with assertions generally). Hence, in principle, properties III and IV are independent of each other and from properties I and II. Our hypothesis, of course, is that properties I and II are intimately related.

Table I summarizes how these properties are reflected in three central classes of projective meanings:

Properties: Classes:	I. Projective	II. Direct Relevance	III. Contextual Felicity	IV. Local Effect
A. Anaphoric	yes	no	yes	yes
B. Speaker-anchored	yes	no	no	no
C. Backgrounded	yes	no	no	yes

Table 1: Some classes of projective meanings

A. Anaphoric presuppositions: This group includes *too*, as well as pronouns, demonstratives and various elliptical constructions, e.g. VP ellipsis and Sluicing. The intended meaning of an utterance containing one of these expressions can only be determined by retrieving an intended antecedent in discourse, hence (III) they are subject to Stalnaker's common ground constraint, and (IV) they have a local effect. If the trigger occurs in a non-global context and has no antecedent in that context, then felicity requires that it "project"—find its antecedent in a higher context, possibly global (I) (van der Sandt 1992). But the anaphoricity *per se* is never taken to be relevant to the QUD, nor can it be directly affirmed or denied (II).

B. Speaker-anchored projective meanings: Potts' (2005) CI triggers are independent of the proffered content of the utterance in which they occur, hence arguably have no local effect (IV). Strikingly, they are independent of the at-issue content of the utterance in the sense that one can judge the truth of the latter while rejecting the speaker-anchored projective meanings, or *vice versa*. Of their nature, they are not understood as direct contributions to the QUD—they are asides (II). Amaral et al. (2008) argue that such triggers are deictic to the understood point of view in the

discourse at the time of utterance, typically that of the speaker, hence by default they project to the global context (I). If this is correct, there is a sense in which they pose a contextual felicity requirement: One must know who the speaker is in order to understand who is committed to the truth of the CI, just as one must know who wrote *I hate Mickey Mouse* on a wall in order to know the actual proposition expressed. But CIs do not presuppose that the interlocutors' common ground entails their truth, hence do not pose a contextual felicity requirement in this sense (III).

C. Backgrounded projective meanings: These include the start state of a change-of-state predicate, and factive entailments. These implications are part of the conventional content of the clause in which they occur—hence are locally entailed to be true (IV); hence, unless appropriately embedded, they cannot be rejected without falsifying the at-issue content of the utterance. But they are typically not taken to be the principal contribution to addressing the QUD (hence "backgrounded") (II). Hence they are typically projective (I), though their status in this respect is sensitive to the discourse structure and other implications (as in (15), (17) and (19) above; and see Simons (2007) for a class of cases where this is so with factive predicates). As is well-known, factive complements, even when they project, are often new information in the context of utterance (III), and in fact much of the recent debate about presupposition accommodation (Abbott 2008 , von Fintel 2008, Gauker 2008) is fueled by the fact that the felicity of a factive doesn't seem to depend on its complement being true in the context prior to utterance.

As I will briefly argue below, this class also contains Horn's (2002) entailed but "non-assertoric" polar implications of approximatives, and the prejacent of only. This category also includes those cases where projection is triggered by prosodic deaccentuation (Schwarzschild 1999, Kadmon 2000, Féry & Samek-Lodovici 2006, Roberts 2010), effectively making the deaccented constituent projective; these cases are interesting because they involve a non-lexical but still conventional trigger for the backgrounding.

Against this background, we return to the question of the status of the prejacent of *only*.

3.   ASSESSING THE STATUS OF THE PREJACENT OF *ONLY*

3.1.   *The properties of the prejacent*

Consider how the prejacent of *only* behaves with respect to the properties in Table 1.

Property I. The prejacent of *only* is projective

The prejacent tends to project, all things being equal. We see this in the family of sentences test (Chierchia & McConnell-Ginet 1990):

Family of sentences contexts are typically holes to the prejacent:

(37)   It's not the case that only Lucy came to the party. / Not only Lucy came to the party.
Implication: 'Lucy came and someone other than Lucy came'

(38)   Did only Lucy come to the party?

(39)   If only Lucy came to the party, it must have been pretty quiet.

(40)   #Did only Lucy came to the party? Of course, *she* did not.

All of (37)–(39) seem to implicate that Lucy came to the party. (40) sounds like a contradiction, not an implicature cancellation (as van Rooij & Schulz 2007, Ippolito 2008 would lead us to expect).

Property II. The prejacent of *only* is typically not taken to be directly relevant to the QUD

The projectivity of the prejacent is arguably related to the fact that it strongly tends to be backgrounded. This is reflected in the fact that it cannot be targeted by direct affirmation or denial, and that it isn't felicitous as the rheme of an answer.

Not targeted by direct affirmation or denial

(41)   a.   Only Lucy came to the party.
        b.   No, that's false. #She did not come. / ✓Monty did, too.[7]

(42)   a.   Only Lucy came to the party.
        b.   That's right, #she came / ✓no one other than Lucy came.
        c.   Well, Lucy did come, but she wasn't the only one.

The use of the hedge *well* in (42c) (along with nuclear accent on *did*) argues that in confirming the prejacent of (42a) the speaker is making a concession which doesn't bear on its direct truth or falsity.

Not felicitous as the rheme of an answer

(43)   a.   Did Lucy come to the party? [directly asking about the truth of the prejacent]
        b.   Yes, she DID./Yes, she CAME./Yes, Lucy CAME.
        c.   #Yes, only she DID./only she CAME/only Lucy CAME.
        d.   #Yes, only LUCY came/only LUCY did.
        e.   Yes, ONLY Lucy came/ONLY Lucy did.

(44)   Who came to the party?
        Only LUCY came/did.

(45)   What's your minimal expectation about who came to the party?
        #Only Lucy came.
        At least Lucy came.

In (43), one can respond felicitously to the question of the truth of the prejacent with the comparable assertion with *only*, but only if the prejacent itself is completely without accent as in (43e) (where *only* receives nuclear accent), not when it does not (43c). Arguably, the rheme of an utterance must bear accent (Féry & Samek-Lodovici 2006), so that in (43e) the prejacent is backgrounded; instead of responding directly to (43a), the speaker responds to the super-question of *who came?*, merely presuming the truth of the backgrounded prejacent.

Together, these two properties of the prejacent argue that across a variety of contexts it is not taken to be directly relevant to the QUD. And that amounts to saying that an utterance with *only* is canonically used in a context where the prejacent is NAI. The fact that the prejacent is typically NAI and tends to project are apparently related. In fact, the

prejacent of *only* does sometimes fail to project in family-of-sentences environments. It seems that this occurs where either the prejacent itself is in question, or there is some other indication that its truth cannot be taken for granted by the interlocutors. Here are some examples:

Failure to project in family-of-sentences environments:

(46) And contrary to what many say I found the level of violence high but not excessive. This isn't only a "shoot 'em up" pointless movie; there's more than just stage blood.
(web example reported in Beaver & Brady 2008:235)

(47) I think people shouldn't marry any other person at the drop of a hat because marriage isn't only a one way street, it gives other people rights as well.
(web example reported in Beaver & Brady 2008:236)

(48) [QUD about a family that generally has lots of kids (5-6 or more): How many kids does each of these siblings have?]
As I recall, Mary's the blacksheep. She doesn't have a lot of kids, but I can't remember exactly how many. Does she only have one kid? Or maybe she doesn't have any? George, do you remember?

(49) QUD: How many kids does Mary have?
George told me that Mary, who has one kid, is the blacksheep of her family. She doesn't have any kids.

In (46), the writer is clearly arguing that the movie in question is worthwhile, hence it would be inconsistent for the prejacent of the second clause 'this is a shoot 'em up pointless movie' to project from under negation. Similarly, the clear intent of the writer in (47) is to deny the prejacent 'marriage is a one way street'. In (48) the question of how many kids Mary has is under discussion, and in fact the speaker makes it clear that for all she knows Mary may not have any; hence the prejacent 'she has one kid' doesn't project from under interrogation in the third sentence. To sharpen the flexibility of the projective behavior of the prejacent, see how it contrasts with that of the non-restrictive relative clause in (49), which obligatorily projects, leading to a sense of contradiction with the last sentence *She doesn't have any kids*.

So the prejacent of *only* is projective, in that it strongly tends to project, and it does not display direct relevance, in that it cannot be the main contribution of the utterance containing *only* to addressing the QUD. Hence it is typically NAI; but whether or not it projects is a function of whether, given the context, it is in fact reasonable to globally presume that it is true.

Property III. The prejacent of only does not impose a contextual felicity requirement

We see this in the potential informativity of the prejacent:

Prejacent is intuitively new information:

(50) [Knock on the door.]
A: Who's there?
B: Only me.   (David Beaver, p.c.)

And in the fact that it is felicitous in a context in which its truth is in question:

Occurrence after questioning the prejacent

(51) A: Who came to the party?
B: Only Lucy.

Recall from the discussion of at-issueness in Section 2 that the fact that an implication is relevant to the QUD—as the prejacent of *only* in (51B) is here relevant to (51A)—does not suffice to make it at-issue. In our examination of Property II just above, we found that the prejacent of *only* is backgrounded and hence cannot be taken as directly relevant to the QUD. Given that native speakers know this (i.e. the asymmetry between the prejacent and exclusive implications is a regular part of its meaning), it would not be reasonable for a speaker to expect an addressee to take the prejacent as the intended at-issue content. Rather, even though it is new information in this context, its truth is presumed, or taken for granted by the speaker. But presumption is not presupposition, not a requirement that the implication is already true in the common ground: The fact that B's utterance presumes (part

of) her answer to A does not preclude felicity in the context where its truth is not known by A, so long as the proffered exclusive content is relevant as well, which it is. Hence, the utterance is felicitous.

Note the difference between (51) and (48): In (48) the speaker explicitly denies knowledge of how many children Mary has, so that projection of the prejacent 'Mary has one kid' from the interrogative would yield pragmatic contradiction. But in (51), B's presumed knowledge of the truth of the prejacent is consistent with A's ignorance.

Property IV. The prejacent of only has a local effect

There is strong evidence that the prejacent is locally entailed, i.e. part of the conventionally given content of the clause in which it occurs. Once the prejacent implication has arisen through the use of *only*, it cannot be cancelled, unlike conversational implicatures. Speaker C in (52) seems to contradict B:

Non-cancellability of the prejacent

(52)   A: Who came to the party?
         B: I'm not entirely sure, because I don't know what Lucy did. But I know the rest of the invitees were at the bar instead, so I'm pretty sure that only Lucy came.
         C: That's right, and I happen to know that Lucy didn't come.

But Horn (1972) offers related examples where the truth of the prejacent can be called into question after utterance of the target with *only*; he calls this phenomenon *Suspension*:

Suspending the prejacent

(53)   a. #Only Lucy can pass the test, [and/but] it's possible that someone else can.
         b. Only Lucy can pass the test, and it's possible even she can't

In (53a), in calling into question the exclusive implication the speaker seems to have contradicted herself; but this is not the case in (53b). Some, including van Rooij & Schulz (2007), Ippolito (2008), have

taken this as evidence that the prejacent can be cancelled, hence is but a conversational implicature. But this seems wrong.

For one thing, if the prejacent is only a conversational implicature, suspension in (52C) should work. It is easy to cancel a quantity implicature without any modality. We see this with 'some but not all the cookies' in (54), 'possible but not certain' in (55), 'warm but not terribly hot' in (56), 'no more than 6' in (57):

(54)   Who ate some of the cookies?
         Lucy did—in fact, she ate all of them.

(55)   Is it possible that Lucy won?
         Yes, in fact, it's certain!

(56)   It's warm out—in fact, it's broiling hot!

(57)   A: Anyone with six kids is eligible for food stamps. Which of these people has six kids?
         B: Lucy does—In fact, she has seven.

Moreover, it seems that suspension crucially requires a modal, like *possible* in (53b). The prejacent is not suspendable in non-modal contexts, unlike mere implicatures, as we just saw. To give a minimal pair, the suspension of 'Hillary trusts Bill' in (58a) is crucially facilitated by the conditional or *perhaps*. It is not felicitous without them, as in (58b); nor is the prejacent suspendable in the non-modal second sentence of (59).

(58)   a. Only Hillary trusts Bill, if (even) she does/and perhaps even she does not.
         b. *Only Hillary trusts Bill, and (even) she does not.

(59)   Only Lucy can pass the text. #(And/In fact,) even Lucy can't.

Moreover, there is strong evidence that Horn's Suspension is not cancellation, but a widening of an (epistemic) modal horizon (von Fintel 1999, 2001). Hans Kamp (p.c.) noted that these examples are odd when the conjuncts are reversed, as we see in (60). And he pointed out that this is parallel with the behavior of counterfactual examples that J. Howard Sobel brought to the attention of Lewis (1973:10). von Fintel (2001) attributes to Heim (p.c.) the observation that reversing

the Sobel example (61) is infelicitous, as we see in (62):

(60)   ??Maybe even Lucy can't pass the test, and/but only Lucy/she can.

(61)   If Otto had come, it would have been a lively party. But if both Otto and Anna had come, it would have been a dreary party.

(62)   If both Otto and Anna had come, it would have been a dreary party. ??But if Otto had come, it would have been a lively party.

<div align="right">(Heim, p.c. to von Fintel 2001)</div>

As von Fintel (1999) puts it, in evaluating a sequence of counterfactuals in a discourse the modal horizon-the set of possibilities entertained in restricting the domain of a modal operator-is "passed on from one counterfactual to the next and. . . .continually evolves to include more and more possibilities." We see this same phenomenon in sequences of modals more generally, as evidenced by the phenomenon of modal subordination (Roberts 1987, 1989, 1996a). But crucially, once a possibility is called into consideration, it cannot be arbitrarily ignored. Hence, the irreversibly of (61). And if we take the phenomenon of suspension of the prejacent of *only* to involve domain restriction of a modal, this explains the failure of reversibility in (60), as well.

If suspension involves widening of a modal horizon, this explains why it crucially involves a modal, as we noted above. Note also that suspension isn't possible when the suspending clause is under the same epistemic modal operator as the prejacent, as in the unacceptable versions of (63B):

(63)   A: Who can pass the test?
       B: It's possible that only Lucy can, and maybe not even Lucy.
       #It's possible that while only Lucy can, (even) she can't.
       #It's possible that in addition to the fact that only Lucy can, (even) she can't.
       #It's possible that only Lucy can and (even) Lucy can't.

Each of these unacceptable versions seems to involve a contradiction under the scope of the modal, as we would expect if the truth of the prejacent were locally entailed.

And even if we use a distinct epistemic operator in the second, suspending sentence of a sequence—as *maybe* in (64a), suspension fails if we explicitly restrict the domain of the second modal to be the same as that of the first (64b); whereas suspension is acceptable if we make it explicit that we have different grounds for the different modal claims, the suspension warranted by a widening of the epistemic modal horizon—taking into account more potentially relevant factors (64c):

(64)   a.   Only Lucy can pass the test, and maybe even she can't.
       b.   #In view of the fact that most people's GRE scores are fairly low and Lucy's are high, only Lucy can pass the test, and in view of her high GRE scores, maybe even she can't.
       c.   In view of everyone's GRE scores, only Lucy can pass the test, and in view of the difficulty of the test, maybe even she can't.

Also, suspension seems to require an epistemic modal. The dynamic modal in (65) (here pertaining to what someone is capable of) doesn't license suspension.

(65)   #Only Hillary could reform health care, and even she couldn't.

All this is consistent with the hypothesis that suspension is not cancellation, but widening of one's epistemic horizon: The speaker first asserts something which entails the backgrounded prejacent implication, but then concedes that if one takes into account more possibilities—a broader epistemic horizon—one cannot be sure that the prejacent is true.

Ippolito (2008) pointed out that that the behavior of the prejacent of *only* is subtly different with respect to suspension (66) than is the projective implication triggered by factive *regret* (50), change of state *quit* (68), or the definite description *her husband* (69):

Ippolito (2008): Other types of presuppositions don't readily suspend:

(66)   It's possible that only Lucy was at the party. . .
       . . .and maybe not even she was there.

(67)   It's possible that Lucy will regret having smoked. . .
       . . .#and maybe she never smoked.

(68)   It's possible that Lucy quit smoking yesterday...
        ...#and maybe she never smoked.

(69)   It's possible that Lucy will go to the Opera with her husband...
        ...#and maybe she is not married.

Though David Beaver (p.c.) points out that examples involving suspension of factives and definite descriptions are attested in the literature, I tend to agree with Ippolito that there is a subtle difference in judgment, e.g. between (66) and (69). I find the latter improved if we replace *and* with *but* or *though*, which is not required for the only examples:

(67′) It's possible that Lucy will regret having smoked...
        ...but maybe she never smoked.

(68′) It's possible that Lucy quit smoking yesterday...
        ...though maybe she never even smoked, and I just thought she did.

(69′) It's possible that Lucy will go to the Opera with her husband...
        ...but maybe she is not married.

I believe the difference here has to do with the fact that there is a different logical relationship between the prejacent and exclusive implications of *only*, on the one hand, and the proffered and projective implications in the other examples. Note that the truth of the prejacent and exclusive implications are completely independent of each other—either might be true while the other is false. But one cannot regret something one doesn't believe one has done, nor can one quit something one isn't doing. Hence, the projective implications in (67) and (68) are, in effect, preconditions on the truth of the proffered content. Similarly, one cannot do something with one's husband if one doesn't have a husband. Hence, in (67′)–(69′) there is a sense that the speaker is reconsidering the entire assertion she has just made. But in (66) the assertion that no one other than Lucy was at the party still holds, despite expression of reservation about the truth of the prejacent.

I think this is crucial to understanding the asymmetry between the prejacent and exclusive implications with respect to suspension, noted in (53) above. I believe that the explanation of this difference lies in

the fact that (a) with *only*, the two implications are independent of each other, as just noted, so that it is consistent to suspend one while holding to the truth of the other, and (b) the prejacent is not directly relevant to the QUD, so backgrounded. If one calls the main, directly relevant implication into question-here, the exclusive implication, that effectively calls into question whether one had adequate grounds to make an assertion in the first place. But though one cannot directly deny the backgrounded-but-entailed prejacent, on pain of contradiction (as in (52C) and (58b)), if one makes clear that one's epistemic grounds for that implication are shaky, one can still be committed to the truth of the asserted exclusive implication, so the assertion as a whole still stands. This is not possible with the triggers in (67)-(69); there, the main assertion fails on suspension, given that it is dependent for its truth on the suspended implication. Hence, there we must use but or though, to concede the potential infelicity of the preceding assertion.

3.2.   *Comparison with approximatives*

In assessing the status of the prejacent of only, it is useful to briefly compare its properties to that of one of the implications triggered by approximates like *almost* or *barely*. Horn (2002) argues that the latter each trigger two implications, and that these implications display a certain asymmetry.

(70)   The implications of approximatives (Horn 2002)
        almost p: polar implication: not *p*
                proximal implication: nearly *p*
        barely p: polar implication   *p*
                proximal implication   nearly not *p*

Horn argues that unlike the proximal implication, the polar implication is *assertorically inert*. A central point in this argument is an asymmetry between these implications in the possibility of licensing negative polarity items (NPIs):

(71)   Gore almost won the election.
            Proximal implication: Gore came close to winning the election.

Polar implication:	Gore didn't win the election
NPIs:	*Gore almost got any votes.

(72)   Bush barely won the election.

Proximal implication:	Bush came close to not winning the election.
Polar implication:	Bush won the election
NPIs:	Bush barely got any votes.

Schwenter (2002) observes parallel behavior in the Spanish approximatives *casi* and *apenas*; and Amaral (2010) makes similar observations about approximatives in Portuguese.

Though Horn et al. don't discuss this, the polar implications of approximatives do tend to project (at least in English—I haven't had the opportunity to explore this for Spanish or other languages with approximatives). Consider the family-of-sentences test:

(73)   Did Gore almost win?

(74)   Did Gore win?

(75)   If Gore almost won, we would congratulate him.

(76)   If John won, we would congratulate him.

(73) and (75) both carry the polar implication of *almost*, that Gore didn't win, which is absent from their counterparts without *almost*, (74) and (76). Hence, I take the polar implications to be projective, displaying Property I from Table 1. But again like the prejacent of *only*, the polar implication will not project if it itself is in question, as we can see, e.g., if we consider the utterance of (73) immediately after that of (74) by the same excited speaker.

The polar implications also do not display direct relevance, Property II. We cannot felicitously directly affirm or deny the polar implication, in contrast with the proximal implication:

(77)   A: Gore almost won the election.
        B: No, that's not true: He didn't even come close!
        B′: #No, that's not true: He won it!

(78)   A: Bush barely won the election.
        B: No, that's not true: He won a clear mandate!

        B′: #No, that's not true: He lost!

We can, of course, answer (74) with (77A):

(79)   A: Did/didn't Gore win the election?
        B: Well, Gore/he almost won the election.

But note that in so answering it is crucial for felicity that we put nuclear accent not on the verb, as we would expect with verum focus on the polar implication, but on *almost*. This parallels the behavior of *only* observed in (43) above, in (79B) indicating that the polar implication is backgrounded, is not the rheme, and that the reply responds to an overarching question *What were the results of the election?*, to which the proximal implication is the directly relevant rheme. The felicity of the hedge *well* in (79B) underlines the indirect nature of the answer with respect to the explicit question (79A). In responding to the larger question, (79B) does address (79A), but only indirectly.

(79B) also shows that the polar implication may be informative, so arguably does not place a felicity condition on prior context (property III).

With respect to Property IV, Local Effect, the polar implication of an approximative is locally entailed, non-cancelable. We see this in (80) and (81) in the unacceptability of the contradiction in the second conjunct of the polar implication triggered in the first.

(80)   #/! Did John almost win and (actually) win?

(81)   #/! If John almost won and (actually) won, then....

(82) is not a counterexample to this claim, despite the fact that the first clause entails that Bush won, while the second contains approximative *almost*, triggering the polar implication that he lost:

(82)   Marcie mistakenly believes that Bush lost, though she thinks he almost won.

The implicit doxastic modal which is part of the meaning of *thinks* in the second clause takes as a modal base the set of propositions that Marcie believes (Heim 1992). The first clause entails that this should includes the (false) proposition that he lost; hence, the polar implica-

tion of *almost* is locally true.

Finally, note that the polar and proximal implications of an approximative are logically independent of each other. Hence, the explanation of suspension asymmetries for *only* which I sketched above would predict that we can suspend the polar implication, but not the proximal. This prediction proves to be correct:

(83)   a. I believe that (at least) Gore almost won the election, and perhaps he actually won it.

        b. I believe that (at least) Gore almost won the election, and #perhaps he didn't even come close.

(84)   a. I believe that Bush barely won the election, if that. [implicates that perhaps he didn't actually win it]

        b. I believe that Bush barely won the election, and #maybe he didn't even come close to not winning/#maybe he won by a landslide.

Thus, the polar implication of an approximative arguably displays strikingly similar behavior to that of the prejacent of *only*.

3.3. *Conclusions about the status of the prejacent*

The debate about the status of the prejacent of *only* has basically been about whether or not to take it to be presupposed.

Is the prejacent presupposed? If we restrict the class of presupposition triggers to those which impose a contextual felicity constraint, as in the classical theories of presupposition projection, the prejacent of *only* is not a presupposition. The prejacent can quite felicitously be new information, a claim supported by the data considered above.

Then the question is how to explain the observed asymmetries between the prejacent and the exclusive implications. Is the prejacent part of what is asserted, or is it merely conversationally implicated? Because the prejacent, like the polar implication of an approximative, cannot be felicitously cancelled, I conclude that the prejacent of *only* is not merely conversational.

But if the prejacent is not conversational and not presupposed, but yet differs in its behavior from the exclusive implication, what can we say about its status? Horn argues that the polar implications of ap-

proximatives are "non-assertoric". He doesn't tell us what it means to be non-assertoric from the point of view of a compositional account of meaning, and he doesn't consider projection in the approximatives, hence says nothing about how being non-assertoric bears on the theory of presupposition projection. But in the context of the present taxonomy we can say more: Non-assertoric behavior is exactly what we would expect of backgrounded and typically projective content if, instead of explaining projection in terms of contextual felicity, we explain it instead in terms of what it is to be not at-issue.

Considered from the perspective of the theory of projection proposed in Section 2 and the taxonomy in Table 1, the status of the prejacent of *only* is not anomalous: There is good reason to think that a wide range of projective meaning triggers are not presuppositional in the sense of Karttunen and Stalnaker, including the factive implications associated with verbs like *know* and *discover*, which were central in the earlier literature on projection. And we find an especially striking parallel to the behavior of the prejacent of *only* in the cross-linguistic behavior of the polar implications of approximatives. It seems from this perspective, then, that the right way to characterize the prejacent is as a backgrounded projective meaning, class C. Hence, as we would expect, it strongly tends to project except when it is contextually at-issue.

4. *ONLY*: AN INTEGRATED ACCOUNT

In the preceding section, I proposed an analysis of the first puzzle pertaining to *only*, about the status of the prejacent. Against the background of that discussion, I now turn to the second puzzle. I first briefly sketch the account of the meaning of *only* due to Beaver & Brady (2008). Then I propose a modification which benefits significantly from their proposal while improving on it in a couple of ways. This resulting theory successfully addresses both puzzles, as well as offering an account of NPI distribution in utterances containing *only*.

4.1. *Beaver & Clark's (2008) exclusive* **only**

Beaver & Brady (2008) offer an integrated account of the meaning of *only* as an exclusive which presupposes a pre-order over its domain. They assume a context σ like that proposed in Roberts (1996a): an

information state with Common Ground CG, a set of Questions Under Discussion (QUD) and a Current Question (CQ).[8] In such a context, *only* has a discourse function—Zeevat's mirative implication, as well as making two contributions to the conventional content of an utterance in which it occurs, one of these a presupposition:

(85)   **Meaning of exclusives**   (Beaver & Brady 2008:251)
The lexical meaning of exclusives is exhaustively described by:
Discourse function: To make a comment on the Current Question…, a comment which weakens a salient or natural expectation. To achieve this function, the prejacent must be weaker than the expected answer to the QUD on a salient scale.
Presupposition: The strongest true alternatives in the QUD are **at least** as strong as the prejacent [with respect to some salient pre-order over the alternatives in the QUD, reflecting the relative strength of one's expectations about the truth of those answers: i.e., the prejacent is the minimum true answer one might have expected].
Descriptive Content: The strongest true alternatives in the QUD are **at most** as strong as the prejacent [in the salient pre-order].

They cash this out in a theory which assumes the centrality of the QUD in interpretation. They propose a Discourse Principle, based on Roberts' (1996a) relevance, and a Focus Principle, a weakening of Roberts' requirement that the focal alternatives of an utterance be congruent with the QUD:[9]

(86)   **Discourse Principle:** Utterances should be maximally relevant to the CQ.
an adaptation of Roberts' congruence-based principles [some utterances may be more relevant than others; see fn.28,p.36, and van Rooij's (2003) development of Groenendijk & Stokhof's (1984) notion of informativity.]
Focus Principle: Some part of a declarative utterance should evoke a set of alternatives containing all the Rooth-Hamblin alternatives of the CQ.
[Beaver & Brady (2008):37]

They use Rooth's alternative semantics to characterize what it means for a constituent to "evoke" a set of alternatives.

Then they propose the meaning of *only* in (88), which depends on the definitions in (87):

(87)   Definitions of lower and upper bounding operators:
$$\mathrm{MIN}_\sigma(\pi) = \lambda w \forall p \in CQ_\sigma \, [p(w) \to p \geq_\sigma \pi]$$
$$\mathrm{MAX}_\sigma(\pi) = \lambda w \forall p \in CQ_\sigma \, [p(w) \to \pi \geq_\sigma p]$$
where $\geq_\sigma$ is a pragmatically given pre-order on the propositions which are possible answers to CQ (which may be a partial order, as discussed below).

(88)   Presupposition and content of *X [only Y] Z*
Presupposition (X [only Y] Z) = $\mathrm{MIN}_\sigma \, (||X\,Y\,Z||^I)$
Descriptive Content: $||X\,[only\,Y]\,Z||^I = \mathrm{MAX}_\sigma \, (||X\,Y\,Z||^I)$

The conventional content of *only* in (88), and hence its use, they claim, presupposes a scale over the possible answers to the Current Question. This scale is a pre-order, which means that it is reflexive and transitive, but, unlike a partial order, not necessarily antisymmetric.[10] The presupposition in (88) requires that the prejacent is the minimum true answer to the CQ—the least true answer one might expect; this is their counterpart of Zeevat's mirative ('one might have expected a higher value'). The descriptive content asserts that the maximum true answer to the CQ is no stronger than the prejacent, their version of the exclusive implication.

On this account, the prejacent isn't directly presupposed or entailed by *only*. However, their Current Question rule guarantees that there are true possible answers to the QUD:

(89)   **Current Question Rule:** The Current Question must contain at least one true alternative, and contain multiple alternatives which are not resolved as true or false in the common ground. [Beaver & Brady 2008:36]

Then, when the presupposed order on the QUD is simple entailment (a partial order), this guarantees that the prejacent is among the true answers to the QUD. Hence, it is true.

Beaver & Clark have a nice example which argues that the exclusive implication of *only* may be scalar, and that the scale it presupposes may be a mere pre-order:

(90)   [Context: There is a contest among collectors to see who can get autographs of the most famous philosophers. Top scores would go for a Russell or a Frege or a Montague. Second rank would include Soames or a Putnam. Getting a Schmuckski is irrelevant, as no one cares about his work.]
        Brady only got a SOAMES.

In this context, the utterance only precludes Brady getting a Russell, a Frege or a Montague. It doesn't preclude his getting a Putnam or a Schmuckski. Hence, this is a mere pre-order. Even nicer:

(91)   Brady didn't only get a SOAMES.

In the context given, (91) seems to implicate that he *did* get a Soames, though Beaver & Clark claim (and their theory predicts) that he needn't have, and it entails that he got something better. For (91) to be true, it wouldn't suffice for him to have gotten a Schmuckski.

The presupposition of *only* interacts with their Focus Principle to constrain what the CQ can felicitously be: If *only* presupposes a pre-ordered set of propositions and the Focus Principle requires evocation of the CQ (to which the utterance with *only* must be maximally relevant), the way to simultaneously satisfy all these requirements is to take the preorder to be over those propositions which are possible answers to the CQ, leading to association with focus.

Beaver & Clark offer additional examples, mostly naturally occurring, which argue that the mirative implication noted above is often a part of the meaning of *only*. (92) is one of theirs, (93) one I constructed:

(92)   I really expected a suite but only got a single room with two beds [web example from Beaver & Clark (2008:252)]
        #I really expected a single room with two beds but only got a suite [constructed]

(93)   Context: Though A knows that B has a cousin Sarah, and knew some months ago that Sarah was pregnant, A had no idea that

Sarah and her family believed she was expecting triplets. A and B are in a café, B gets a call and has a short conversation. After B gets off the phone:
A: You looked surprised. What's up?
B: Sarah only had twins.

A here might reasonably be expected to ask: ONLY *twins? Was she expecting more?*, i.e. B's response is odd for A because of her *lack* of expectation (and the rarity of triplets). This underlines the virtue of treating the least-strong true answer implication as a *pre*supposition.

There is much of value in Beaver & Clark's proposal, aspects of which will be reflected in the theory proposed in the next section. But there some problems as well:

Problem 1: The prejacent should be entailed by the meaning of *only*[11]

On their theory, the prejacent isn't either presupposed or entailed in cases with a mere pre-order. Hence, (90) could be true if Brady got a Putnam but *not* a Soames, since both have the same value on the relevant preorder, and the presupposed plus proffered content only require that he got something exactly as strong on that scale as a Soames. I suppose they could get around this by saying that in mentioning the Soames the speaker implicates that that would be the relevant instantiation of the true value on the scale. But things are worse in (91), which doesn't entail that Brady got either a Soames *or* a Putnam, only a Russell or a Frege or a Montague.

This strikes me as wrong. In (90) and (91), I think the prejacent is clearly implicated to be true, so that Brady did get a Soames. Given the evidence in Section 3 that the prejacent of *only* must be locally true, I think we should conclude that it is part of the conventional content of utterances involving *only*.

Moreover, their theory predicts that when the presupposed order is partial, then the prejacent is *presupposed* in the sense of putting a felicity condition on the interlocutors' Common Ground. But we have also seen evidence in section 3 that that is not correct.

Problem 2: The alternative set associated with *only* isn't always the QUD:

The definitions of MIN and MAX in the meaning of *only* in (87) pin the scale presupposed by only to the current question on the QUD stack. Hence, Beaver & Clark derive association with focus in *only* from its conventional presupposition, under (87) and (88), plus the Focus Principle in (86). The latter effectively requires prosodic congruence to the QUD, (87)/(88) pin the alternatives in the domain of *only* to the same QUD, and together these require that the alternatives that the exclusive quantifies over are, in fact, the alternative possible answers to the QUD as reflected in the prosodic focus. Thus on their account, *only* conventionally associates with focus, though somewhat indirectly.

However, Kadmon & Sevi (this volume) offer an example where the alternative set presupposed by *only* is not the QUD:

(94)   A: What's peculiar about Granny's dog?
         B: She only barks at John
                H∗ !H∗   !H∗ L L%
         [who's the most unthreatening person I know].
         (Kadmon & Sevi 2010)

The prosody of (94B) is given in ToBI transcription (Beckman & Ayers 1994). It consists of a single Intonational Phrase with a series of down-stepped High pitch accents (H marked with '∗'), followed by the typical English phrase final tones in an assertion—a Low phrase accent and Low boundary tone (the last marked with '%'). Each word in (94B) except for the pronoun *she* and the preposition carries a pitch accent. So the prosodic focus in (94B) is broad, covering at least the entire VP, if not the whole utterance. (94B) is clearly a felicitous response to (94A), and in keeping with its prosodic focus, (94B) in its entirety is arguably rhematic, corresponding to the *wh*-word *what* in (94A): The VP in (94B) denotes a property such that the fact that it holds of the subject is what makes that subject peculiar.

But crucially, on the understood reading of (94B) *only* semantically associates with *John*. The speaker is clearly asserting that of all the people the dog might bark at, she barks at no one except John. The non-restrictive relative clause follow-up clearly specifies why John, in fact, corresponds to one of the lowest values on the scale of bark-inducing people (or creatures). Hence, the constituent with which *only* asso-

ciates is not the prosodically focused constituent, which is congruent with the QUD. Hence, in this example *only*'s domain isn't given by the QUD; i.e., it doesn't associate with focus.

Here's another way to pose the problem: The mirative predicted by Beaver & Clark is 'The strongest true alternatives to the QUD are at least as strong as the prejacent.' Given the QUD and the prejacent 'Granny's dog barks at John', the predicted mirative amounts to: 'Out of all the true alternatives that characterize what is peculiar about Granny's dog, all of them are at least as strong as the proposition that she barks at John.' But that seems just wrong. B isn't claiming that the prejacent is among the likely answer(s) to the QUD—and in fact the follow-up about how unthreatening John is might be taken to suggest that the speaker takes it to be peculiar that Granny's dog barks at him at all. Or at least, if she barks at John, we'd expect her to bark at more threatening people as well. Hence, the contribution of *only* in B's utterance seems to be merely to entail that of all the people G's dog might bark at, the sole individual she barks at is John—an entailment-based exclusion. And the actual mirative implication of (94B), as reflected in the follow-up, is 'Out of all the properties that we might expect to hold of Granny's dog, one of the most peculiar would be that she barks *at John and no one else*'. Hence, the domain restriction and exclusivity are not correlated with the QUD (as reflected either in the actual preceding interrogative or in the presupposition triggered by the wide-scope prosodic focus).[12]

As Kadmon & Sevi argue in detail, it is pragmatic reasoning that gives us the associate of *only* in such cases, and not the prosody of the utterance or the conventional meaning of *only*. Thus, arguably it is not the case that the preordered alternative set presupposed by *only* has to equal the QUD.

Problem 3: There isn't always a mirative implication:

Consider again (90). In order for this utterance to be felicitous, would the interlocutors really have had to expect that the least Brady would get is a Soames? I don't think so. In the most plausible cases where the mirative implication arises, like (92), there are special factors: Here, the first clause, with the verb *expect*, itself entails the mirative implica-

tion. And in (93), the context establishes the expectation (on the part of the speaker) that Sarah would have twins.

Moreover, recall examples like (38):

(38) Did only Lucy come to the party?

Here, it doesn't seem that the speaker expects that more people might have come. In fact, she might quite plausibly be expecting a positive answer to her question. Hence, while I think the proposed scalarity of *only*—the presupposition of a relevant pre-order over the domain of the quantifier in the exclusive implication—is plausible and insightful, the mirative proposed by Beaver & Clark is too strong.

Over the range of examples with *only* that we have considered in this paper, the strongest plausible general mirative implication is a weaker one, to wit: One *might have expected* a stronger value on the scale to be true. But there is no need to stipulate this. Given that we have a preorder over possible answers, this weak mirative follows as a Quantity 2 implicature. In asserting a particular value on a *given* scale, why use *only*, with its asserted content 'not stronger', if you didn't believe there was a stronger possible answer to the QUD? To put it another way: There's no need to deny the existence of stronger true answers if the proffered answer is the strongest on a previously given scale over the possible answers. So the weak mirative follows conversationally from the presupposition of a scale over the possible answers to the QUD and the use of *only*. If the mirative seems stronger in certain examples, that is due to contextual factors.

4.2. *A new theory of* **only**

In keeping with the preceding discussion, I offer an account of *only* as involving two entailed implications, the prejacent and an exclusive implication which, like that in Beaver & Clark, presupposes a salient preorder over the elements in the domain of quantification. Though both are part of the conventional content of *only*, the two implications have a different status: The prejacent is backgrounded, hence tends to project, while the exclusive implication is proffered, and hence does not. I will also suggest that this difference is crucial in explaining the distribution of NPIs in utterances with *only*. Here, I only give these

implications for *only* with a type <s,t> complement, though it could be generalized to reflect the fact that *only* is of variable type.

(95)   A sentence S with logical form *only p, p* a proposition,
            has the following conventional content:
                p and **for all q $\in$ Q, if p $<_Q$ q, then not q**
            i.e.
            Presupposition: a preorder $\leq_Q$ over a relevant
                                             set Q s.t. $p \in$ Q
            Backgrounded prejacent: p
            Proffered exclusive: for all q in Q, if p $<_Q$ q, then not q

As in Roberts (1996a, 2004), I use the term *proffered* here to generalize over cases where the utterance with *only* is used to make an assertion, to pose a question, or to make a suggestion.[13] The proffered status of the exclusive implication is indicated in the logical form by boldface; the background status of the prejacent by lack of boldface. The fact that *Q* and the associated order are presupposed follows from the fact that they are free in the logical form in (95) (unlike *p* and *q*); hence, they are effectively anaphoric. Thus, the proffered content of *only* involves quantification over this presupposed domain of ordered alternatives, proffering that the prejacent is the maximum true answer in the given pre-order.

The proposal in (95) is as yet informal, and leaves open some important questions: How could it be implemented in a compositional grammar? In particular, how should we model the distinction between backgrounded content on the one hand and presupposed or proffered content on the other? I assume there is very good reason to model the proposal in a dynamic grammar, and that in such a grammar presupposition would play the role of a constraint on felicitous context of the sort we find in Heim (1982, 1983), proffered content serving as the asserted portion of her Context Change Potentials. The puzzle is how to model the backgrounded content. Potts (2005) argued that his not-at-issue CIs should be modeled in a separate dimension from that of his at-issue content (roughly, my proffered content). But Amaral et al. (2008) demonstrate that this makes the wrong predictions where anaphora is concerned: Potts fails to observe that discourse anaphora is possible across the two dimensions, a fact which his two-dimensional

account cannot capture. Moreover, to the extent that it was successful, Potts' account relied crucially on the fact that the CIs he considered always projected to the global level. But many of the NAI implications considered here need not be globally implicated—those of *only* and the factive verbs, among others, may fail to project. We need an account that introduces NAI, backgrounded content in the same "dimension" as proffered content-under the scopes of at-issue operators, for example, as in (46)–(48) above, but treats them differently for the purposes of (a) licensing NPIs, and (b) satisfying requirements on discourse coherence, including Relevance.

To date, no one has developed a formal framework that can capture the behavior of backgrounded implications like that of the prejacent of *only*, though several projects in that vein are in progress, including work both by Beaver, Roberts, Simons and Tonhauser, and by Carl Pollard and Scott Martin. Hence, for the present the proposal in (95) must stay informal. But I do think it clarifies what such a framework must accomplish, and some of the distinctions it must be able to make.

Compare (95) with the theory of Beaver & Brady (2008) reviewed above:

- According to (95), the prejacent is entailed; whereas it isn't even presupposed in Beaver & Clark. This permits us to account for the full range of data in section 3, addressing problem 1 for Beaver & Clark.

- But here the prejacent is backgrounded (not proffered). Thus, it tends to project; but it needn't—e.g. in those cases considered above where the prejacent itself was at-issue, or where projection to the global level would otherwise lead to some conflict with prior information in the context of utterance.

- As in Beaver & Clark's theory, the treatment of the exclusive presupposes a pre-order over the domain, which includes the prejacent. This permits us to account for their examples where exclusivity only precludes the truth of stronger elements in that pre-order, not those that are weaker, as in their (90) and (91). I assume, as they do, that this order may in many cases be a stronger, partial order, with entailment as perhaps the default.

- However, the domain of the presupposed order is not necessarily the set of propositions in the QUD (their Current Question). As in Kadmon & Sevi's *Granny's dog* example (94), the pragmatically given set of alternatives may be other than the QUD, so long as the resultant utterance interpretation is relevant to the QUD and felicitous in other respects. This accounts for problem 2 for Beaver & Clark. However, as we will see, the pragmatics of focus and domain restriction will still predict that that is the default interpretation.

- Similarly, there is no Focus Principle *requiring* prosodic congruence with the QUD. Rather, following Roberts (1996a), I only assume that every utterance must be relevant, i.e., address the QUD, though possibly only indirectly.

- Unlike Beaver & Clark's (2008) theory, in (95) there is no expectation of a stronger true answer to the QUD than the prejacent, hence no consistent mirative implication. This addresses problem 3 for their theory. As discussed in the previous section, I think we can derive the mirative implication, when it arises, as a conversational implicature.

Some pressing questions arise:
(a) how to derive the very strong tendency for focus-sensitivity and the difference between *only* and other superficially focus-sensitive elements like *always*, discussed at length by Beaver & Clark;
(b) how to predict the distribution of Negative Polarity Items (NPIs) with only; and
(c) how to formally derive the attested projective behavior of the backgrounded prejacent.

Addressing these in turn: As for why *only* most often associates with focus, I think we can attribute this to the confluence of three important factors: (i) the fact that prosodic focus itself is strongly constrained by the QUD (see Roberts (2010) for additional arguments for this assumption), (ii) the fact that relevance to the QUD is a strong requirement on contextual felicity, and (iii) the fact that the most direct way for an utterance to be relevant, and hence arguably the easiest for an addressee to understand, is to directly address the QUD by differentiating the likelihood of the alternative possible answers. When *only*

associates with focus, the interpretation accomplishes all three of the associated desiderata simultaneously: resolving the presupposition associated with prosodic focus (Rooth 1992), making the utterance relevant, and doing so in the most straightforward, readily retrievable fashion. Only when other contextually relevant alternatives are sufficiently salient *and* differentiating among them would also address the QUD do we see non-association, as in (94).

Turning to the question of NPI distribution, it has long been recognized that NPIs are licensed in utterances with *only*, but not in the prosodically focused portion of the utterance containing it (Jacobsson 1951, Jacobson 1964, Visser 1969, Horn 1969, 1996, 2002; Beaver & Brady 2008). This is illustrated in the examples in (96):

NPI occurrence in the non-focused portion of utterances with *only*:

(96)   a.   Only [Lucy]$_F$ has *any money* left.
         b.   *Lucy only has [*any money*]$_F$ left.
         c.   Lucy only has [sm money]$_F$ left, no travelers' checks.

Most recently, Beaver & Clark (2008:chapter 8) examine the distribution of NPIs in utterances with *only* in great detail. Summarizing briefly, *only* licenses both weak and strong NPIs, but only in what they call "non-focal expressions in the domain of the exclusive"—what I would characterize as the non-focused portion of the prejacent. We see this in the following, with the weak NPI *care to* in (97), strong NPI *give a damn* in (99):

(97)   Because we found one order of this group to be much more likely than any other, we probably only care to see the map distances for this single order.

                                        (Beaver & Brady 2008:196)[14]

(98)   #/?We probably only [care]$_F$ to see the map distances.

(99)   Well, I certainly don't give a damn. I only gave a damn because I thought [you did]$_F$

                                        (Beaver & Brady 2008:196,191)[15]

(100)   #I only [gave a damn]F about you.

Although the focal structure of (97) is not explicitly given in the written source text, the most natural prosody would focus both *the map distances* and *this single order*, with no accent on *care*. To my ear, the constructed counterpart with focus on NPI *care* is distinctly odd: We can, of course, focus *care* in the scope of *only*, but in that case it doesn't have the idiomatic NPI sense, and then the infinitival complement is odd. Similarly, (100) is quite odd with focus on the NPI *gave a damn*. Beaver & Clark note that in (99) *gave* might also be focused, but in contrast to the present tense in the preceding sentence, not in association with *only*. I agree with that characterization. Note that in (100), focus on *gave a damn* would involve an accent on *damn*, not necessarily on *gave*.

Because the meaning of only on Beaver & Clark's account does not entail the truth of the prejacent, their account of NPI licensing is complicated. Earlier, Horn (2002) had pointed out that *only NP* cannot be a classical DE operator, given lack of entailment from his (101a) to (101b):

(101)   a.   Only Socrates entered the race.
         b.   Only Socrates entered the race early.   (Horn 2002)

(101b) only follows from (101a) if we assume that Socrates entered the race early, which is not entailed by (101a) or by his merely entering the race. Beaver & Clark address this issue by adapting a notion due to von Fintel (1999), *Strawson downward entailment* (for weak NPIs); for strong NPIs, where Zwarts (1998) had argued only occur in anti-additive environments, they similarly define a notion of *Strawson anti-additivity*.

The following illustrates why this modification of the usual notions is independently required to appreciate the distribution of NPIs in the complements of presuppositional functors: Suppose we want to test whether the restriction of a possessive NP like *John's* is a downward monotone context. We know that the set of German Shepherds is a proper subset of the set of dogs. Therefore, we test with (102):

(102)   a.   John's dogs are well-behaved.
         b.   John's German Shepherds are well-behaved.

Does the truth of (102a) entail the truth of (102b)? Not necessarily, because *John's CNs* presupposes that there are some CNs that John has. This interferes with our judgments about the relation between the propositions in (102), because it may be true that John has dogs but not that he has German Shepherds. Therefore, we must test instead for Strawson downward monotonicity, as defined in Beaver & Clark's (103), with (104):

(103) **Test for Strawson downward monotonicity:**
Let presupposition(ψ) be the strongest implication presupposed by ψ. The expression α occurs in a Strawson downward monotone position in a sentence φ iff for any β which is stronger than α, the combination of φ and presupposition $(\varphi[\alpha/\beta])$ entails $\varphi[\alpha/\beta]$.
(Beaver & Brady 2008:193, after von Fintel 1999)

(104) a. John's dogs are well-behaved and John has some German Shepherds.
b. John's German Shepherds are well-behaved.

(104b) now seems to follow from (104a), arguing that the restriction of *John's* is a downward monotonic environment. If we then assume that Strawson downward monotonicity licenses NPIs, this correctly predicts the occurrence of weak NPIs in the complement of *John's*:

(105) John's friends who care to visit him at home are impressed with his dogs, because they are so well-behaved.

Even if we take the prejacent of *only* to be entailed but backgrounded, as in (95), to test for downward monotonicity of the non-focused portions of the prejacent, we must control for the truth of the background. As with Horn's example, it is odd to ask whether (106a) entails (106b), because of the focus in the latter. So, instead, we test for Strawson downward monotonicity, taking *presupposition* in Beaver & Clark's Definition 3 to be generalized to include all projective meanings, including backgrounded implications like the prejacent, as in (107):

(106) a. John only walks [to the park]$_F$.
b. John only walks quickly [to the park]$_F$.

(107) a. John only walks [to the park]$_F$ and John (sometimes) walks quickly to the park.
b. John only walks quickly [to the park]$_F$.

If I assert (107a), then you can reasonably conclude (107b), arguing that the non-focused portions of the prejacent of *only* are in a Strawson downward monotone environment, hence that weak NPIs are licensed there.

Similarly, to test for whether the non-focused portions of the prejacent are anti-additive, we must control for the background, again generalizing Beaver & Clark's (108) to take *presupposition* to cover backgrounded implications:

(108) **Test for Strawson anti-additivity:** The expression α occurs in a [Strawson] anti-additive position in a sentence φ iff φ and $\varphi[\alpha/\beta]$ are together equivalent to the combination of $\varphi[\alpha$ / α or $\beta]$, the presuppositions of φ and the presuppositions of $\varphi[\alpha/\beta]$.
(Beaver & Brady 2008:195, modifying the anti-additivity of Zwarts (1998))

Then consider:

(109) a. John only walks [to the park]$_F$ and John only skates [to the park]$_F$.
b. John (sometimes) walks to the park and John (sometimes) skates to the park, and John only walks or skates [to the park]$_F$

If (109a) is true, then this entails that (109b) is true, and *vice versa*, arguing that the non-focused portions of the prejacent of *only* are in a Strawson anti-additive environment, and explaining why strong NPIs are licensed there.

More intuitively, note that in the logical form in (95), those alternatives in the domain set Q which are stronger than the prejacent fall under the scope of negation in the meaning of the proffered exclusive implication, a downward-entailing, anti-additive environment. In the usual case, where focus suggests congruence with the QUD (which hence gives the domain for the exclusive implication) and the focused

constituent corresponds with the rhematic portion of the reply, we are guaranteed that the non-focused portion of the prejacent will be part of *q* for each excluded *q*, falling under the scope of negation. Since the focused content is what distinguishes *p* from these excluded alternatives, that content will not fall under the scope of negation. Hence, in those canonical occurrences of *only* only the non-focused portions of the prejacent occur in downward entailing environments which license NPIs. But as we saw above in Beaver & Clark's (99), where focus is otherwise motivated it can occur in the rhematic portion of the prejacent, associated with *only*. We can also see this in (110), where contrastive focus on an NPI is involved in correcting a misunderstanding:

(110)   A: I never look at other women. I only give a damn about [you]$_F$!
         B: [rather hard of hearing:] You *damn* me!?
         A: No no! I said I only [give a damn]$_F$ about you!

Beaver & Clark use a contrast between the NPI licensing properties of *only* and those of *always* to argue that there must be a conventional trigger for association with focus in *only*, but not in *always*. A detailed investigation of this difference goes beyond the scope of the present paper. But let me quickly sketch an alternative approach to explaining the differences between these expressions, and others like them.

I think we might expect projective content in a range of expressions we might call *scalar*, which includes *only* but not *always*. Compare *only* with the approximative *almost* and with *even*, their meanings schematically presented in (111):

(111)   *only*: p and **for all q ∈ Q, if p < q, then not q**
                 proffered: nothing stronger than p is true
         barely: p and **nearly not p** (proximity to some standard on a scale; see Amaral 2010)
                 proffered: that *p* came close to being false
         even: p and **for all q ∈ Q: if q ≥ p, then q**
                 proffered: that something as weak as *p* is true

Note two common factors in all these cases: First, each presupposes some order over a given set of elements. And second, in all these cases, what's noteworthy isn't the truth of *p*, but where it falls on that presupposed order. So the noteworthy fact about the position of *p* on the scale is foregrounded, while the truth of *p* itself is backgrounded. Hence, *p* tends to be taken for granted, not to be at-issue, as reflected in its projective character with each of these lexical triggers. Surely this is not a coincidence. This distinguishes the scalars from other operators, like quantificational adverbs, which can sometimes display apparent focus-sensitivity in domain restriction (Rooth 1985). Also note that like *only*, the approximative implication of *barely* licenses NPIs, unlike the polar implication in its counterpart *almost*, as discussed above; but we would expect this on the logical form for *barely* sketched in (111).

Rooth 1985 had offered examples where *always* displays apparent association with focus, but Cohen (1999) argued that this is not generally the case, and Beaver & Clark (2008:204ff) offer an extended argument that in fact the apparent association in that case is an artifact of independent contextual factors. I think that argument is correct. Unlike the triggers in (111), I take VP-modifier *always* to involve standard universal quantification over events (de Swart 1991), with a logical form roughly $\forall e[e \in Domain \rightarrow VP(e)]$. Here, even if prosodic focus plays a role in helping the addressee determine the intended domain of events—in (112), say, those events in which Mary is in the shower-that relation is contextual and plays no role in the logical form for *almost*, in particular in the downward entailing environment of the restriction $e \in Dom$.

(112)   Mary always [sings]$_F$ in the shower.

So the difference in NPI licensing of *always* vs. that of *only* and *barely* is explained straightforwardly as a function of the fact that in the logical forms of the scalars the non-focused portion of the prejacent and the polar implication, respectively, occur in downward entailing environments; whereas this is not the case for the Focal presuppositions sometimes at play in the interpretation of *always*. Generally, we do not need to posit conventional association with focus to account for the different behavior of *only, even*, and *barely* vs. *always*. Instead, we hypothesize that in the scalars it is the conventional presupposition of an ordered set over a relevant domain of entities, in combination with the alternative *pragmatics* of a QUD-based theory of relevance, which leads to the association with focus effects, as I have sketched above.

Beaver & Brady (2008) use conventional association with focus to help account for two other properties of expressions involving only which Beaver & Brady (2003) had noticed earlier: *only* cannot associate with reduced, extracted or elided material, whereas *always* can. But as they themselves note (2008:274), this prohibition should be ruled out by their independent conditions on discourse. This holds in the present account as well, at least in the default case where the prosodic focus of the utterance with *only* does indicate the intended domain of quantification for the exclusive implication. Foci do not reduce, and are not elided or extracted. We can see this in examples that have no instances of *only*:

(113)   A: How did you upset John? Did you discuss Marcia with his mother?
         B: No, I discussed $[\text{him}/\#\text{'im}]_F$ with his mother.

(114)   A: I went walking. What did you do?
         B: I $[\text{did too}/\#\text{did}]_F$

(115)   A: Steve told me you stocked Kim's pond with clownfish.
         B: #No, Kim's is a $[\text{tank}]_F$ I stocked with clownfish.

In (113), contrastive focus on the pronominal direct object is inconsistent with reduction. In (114), the elided VP must serve as the rheme in order to be relevant to the QUD, but this in turn requires that it be focused, so bear accent. But *did* seems to be like *'im*, resisting accentuation: If a constituent with *did* is to bear focus, there must be some other lexical item which can bear the associated accent. So (114B) is acceptable with *too*, which bears accent, but not with *did* alone. (The subject *I* is also focused in (114B), to mark the contrast with the denotation of the subject of A's utterance, but that is independent of the requirement in this context of a focus on the VP.) And in (115), the contrastively focused *tank* cannot be felicitously extracted (though (115B) is otherwise perfectly grammatical, and could even be felicitous in a different context); cf. their examples in Beaver & Clark (2008:section 7.2). *Always* differs in these respects, but as they themselves conclude, *always* derives its domain in a different fashion, so we would not expect a parallel in this behavior.

Finally, as for projection, it would go well beyond the scope of the present paper to attempt to present a formal theory of how backgrounded (non-anaphoric) content projects, though formal accounts along these lines are under development, as noted above. Here, I hope only to have convinced the reader that there is independent motivation for such an account (Section 2) and that in this respect *only* does fall into class C of projective contents as characterized in Table 1, with an especially intriguing parallel to the polar implication of approximatives (Section 3). The asymmetry between the prejacent and exhaustive implications of *only*, as between the two implications of approximative *almost*, is sufficiently robust that I take the distinction between backgrounded and proffered content to be part of the meanings of these words.[16]

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Notes

[1]This section of the paper reports on joint work with David Beaver, Mandy Simons and Judith Tonhauser, with support from the U.S. National Science Foundation, grant #0952571; see our work cited below. The authorial *we* in this section refers to this group of colleagues. I note here and there points with which my colleagues might not agree, and I alone am responsible for the material in sections 3 and 4 below.

[2]Amaral, Roberts & Smith argue that this claim is incorrect, but it is true almost all the time and will suffice for our present purposes.

[3]Note that these appositive CIs could easily be modified to form NRRCs with comparable content.

[4]See Roberts (2004) and the afterword to the forthcoming publication of Roberts (1996a) for discussion of the intentional structure of discourse, and in particular of how the goals corresponding to particular questions may be subsumed under over-arching domain goals of the interlocutors.

[5]This is not to suggest that these are the only properties of interest in the study of projective meanings. See Roberts et al. (2009), for a brief review of some others.

[6]This is not the term my colleagues and I have used to characterize this property in our joint work, and they might well not approve of it here.

[7]I originally included another answer, claimed to be unacceptable: *That's false. Nobody came.* But though I find this awkward at best, at least one reviewer thought it sounded fine. This requires more thought, and consideration of a wider range of judgments.

[8]Beaver & Clark use the term *Current Question* to refer to the topmost question on the stack of questions under discussion. Roberts (1996a) referred to both that stack and its top question as the QUD, a terminology which I retain because it seems that context always makes it clear which is intended.

[9]Beaver & Clark don't require equality between the alternative set and the CQ denotation, as demanded by congruence, but only that a part of it is congruent, the relaxation simplifying the analysis of sentences in which a clause is embedded under a propositional operator: *Who laughed? I think [Mary]$_F$ laughed.*

[10]To refresh your memory, here are the relevant notions:
• $a \leq a$ (reflexivity)
• if $a \leq b$ and $b \leq c$ then $a \leq c$ (transitivity)
• if $a \leq b$ and $b \leq a$ then $a = b$ (antisymmetry)

Any collection of sets is preordered by their cardinality. Thus {the sun, the moon} $\leq$ {Hank, Jane, Lucia}. But this preorder is *not* a partial order, since {the sun, the moon} $\leq$ {Hank, Jane} and {Hank, Jane} $\leq$ {the sun, the moon}, but {the sun, the moon} $\neq$ {Hank, Jane}.

[11]Beaver himself (p.c.) now believes that the prejacent of only is entailed. See Coppock & Beaver (2010).

[12]Crucially, this counter-example to Beaver & Clark's claim about focus-sensitivity involves broad prosodic focus, congruent with the overt preceding question. If the overt QUD were not congruent with the prosodic focus, they might claim that the interpretation of (94B) reflected a strategy of inquiry with a prosodically congruent implicit sub-question which gave the restriction on *only*. But I do not see how they could make that move in the case of Kadmon & Sevi's (94).

[13]One might take the notion of *the proffered content* in an utterance (Roberts 1996a) to be that which displays direct relevance. I.e., the proffered content of a constituent is that which contributes to those implications which are canonically directly relevant to the QUD. That is my assumption here.

[14]Naturally occurring, from Stephen Lincoln, Mark Daly & Eric Lander, *Constructing Genetic Linkage Maps with MAPMAKER/EXP Version 3.0: A Tutorial and Reference Manual*, Whitehead Institute for Biomedical Research Technical Report, January 1993.

[15]The original example, without focus marked, is from Jamie Malankowski "Five Finales: How to wrap up Seinfeld? We offer some suggestions", *Time Magazine* 151:17, May 4, 1998.

[16]One might, very reasonably in my opinion, take issue with a claim that this distinction is *conventional* in the sense of Lewis (1969), since it seems to be a feature of (near-) translation equivalents in other languages. Beaver & Clark briefly discuss the behavior of *only*-counterparts in several other Indo-European languages. Also, see the discussion in Toosarvandani (2010) of other, related expressions in both English and Persian—his additives and adversatives. Nonetheless, descriptively I take the backgrounding of the prejacent to be a regular feature of the meaning of *only*, and leave the discussion of detachability for another occasion.

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