

Keep *only* strong*

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Abstract As defined in Horn 1969, $\llbracket \text{only} \rrbracket(p)$ presupposes p . von Fintel & Iatridou (2007) note, however, that $\llbracket \text{only} \rrbracket(\Box p)$ may presuppose that p is *possible*, rather than *necessary*, and propose revising the analysis of *only* to weaken its contribution. Building on Ippolito 2007, we show that this revision predicts interpretations which are too weak in data involving plurals and negation. A paradox thus arises: Horn’s *only* is too strong in some cases, but required in others. To resolve the paradox, we maintain Horn’s *only*, but introduce an external source of weakening that is not always available: in von Fintel and Iatridou’s modal environment, the argument of *only* is weakened by a covert operator (AT LEAST, Crnič 2011; Schwarz 2004) that is blocked in the problematic cases involving plurals and negation.

Keywords: *Only*, sufficiency modal construction, AT LEAST, grammatical weakening

1 Introduction

As defined in Horn 1969, *only* applies to a proposition p (its ‘prejacent’), presupposes that p is true, and asserts that all alternatives not entailed by p are false:

$$(1) \quad \llbracket \text{only} \rrbracket^{\text{ALT}}(p) = \lambda w : p(w). \forall p' \in \text{ALT} [p'(w) \rightarrow p \subseteq p']$$

This paper is concerned with the presupposition of *only*. In basic data such as (2a), a prejacent presupposition is supported: (2a) conveys that you visited the North End, which is the prejacent of *only*, given the LF in (2b).

- (2) a. You only visited the North End.
b. $[_{\text{TP}} \text{only} [_{\text{VP}} \text{you visited [the North End]}_F]]$

Yet, in some cases, the prejacent presupposition seems too strong. Consider the configuration in (3), due to von Fintel & Iatridou (2007) (hence vF&I).

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(3) To get good cheese, you only have to go to the North End.

With the LF in (4) and *only* analyzed as in (1), (3) should presuppose a necessity claim: that you have to go to the North End for good cheese. Yet, that is not intuited. Rather, (3) has a ‘minimal sufficiency’ reading where it says that the North End is one easy place to get good cheese. At its core, that is a *possibility* claim: that you *can* go to the North End for good cheese.

(4) $[_{TP} \text{ only } [_{VP_2} \text{ have to } [_{VP_1} \text{ you go to [the North End]}_F]]]$

How does necessity weaken to possibility under *only*? vF&I revise the analysis of *only* itself (Section 2). First, they modify its presupposition: instead of triggering the ‘strong’ prejacent presupposition in (1), *only* carries just a ‘weak’ existential presupposition (in effect, that some alternative is true). Second, they propose a syntactic decomposition of *only* so that the presupposition is triggered by a covert head taking low scope under the modal in (3).

We build a case to maintain the analysis of *only* in (1), despite the apparent problem. Based on Ippolito 2007, we show that a weak existential presupposition for *only* results in readings which are *too* weak in data involving plurals and negation (Section 4). Moreover, *only* exhibits different properties from baseline constructions with an overt decompositional syntax (Section 3).

If *only* is strong, weakening in (4) must come from another source. We propose that natural language makes available a covert operator—AT LEAST (Crnič 2011)—which can be inserted into *only*’s scope (Section 5). In (4), AT LEAST results in the prejacent of *only* being weaker than it appears from the surface string. As we will see, the revised prejacent is viably presupposed. Because the source of weakening is separate from *only*, there is no expectation that weakening should be detected in all environments where *only* appears. In Section 6, we suggest that weak readings track the distribution of AT LEAST, which is blocked on pragmatic grounds in the plural and negation data from Section 4.

An extensive body of recent work has argued for a covert operator, EXH, which has a meaning similar to *only* and thus *strengthens* its prejacent by introducing an extra exhaustive entailment (e.g. Chierchia, Fox & Spector 2012). If our reasoning is successful, a covert *weakening* operator exists, as well.

2 Prior analysis: Revising *only*

We begin by presenting vF&I’s revision to *only*. First, they decompose *only* into two morphemes: sentential negation and an exceptive. The basic example in (2a) has the LF in (5). NEG occurs at the site of overt *only*, while EXC is covert. EXC composes with the focused DP to create a quantifier, which scopes below negation.

Keep *only* strong

(5) $[_{TP} \text{ NEG } [_{VP} [\text{EXC } [\text{the North End}]_F] \lambda 1 [\text{you visited } t_1]]]$

The EXC head is responsible for presupposition triggering. Given the lexical entry in (6), EXC triggers an *existential* presupposition: in (5), that you visit somewhere. For illustration, we assume just three alternative locations (the North End, New York, and Switzerland), abbreviate the proposition that you visited place x as ϕ_x , and represent existential claims with equivalent disjunctions. The presupposition, then, may be stated as (7), and that projects globally, over negation.

(6) $[[\text{EXC}] = \lambda x_e. \lambda f_{(e,st)}. \lambda w : \exists y[f(y)(w)]. \exists z[z \neq x \wedge f(z)(w)]$

(7) $P: \phi_{NE} \vee \phi_{NY} \vee \phi_S$

With respect to assertion, EXCP also makes an existential claim: that you visited somewhere other than the North End. Negation operates on that proposition to derive the exhaustive inference in (8)—that you did *not* visit anywhere else. For (2a), (7) and (8) together yield the same inferences that the strong *only* in (1) would.

(8) $A: \neg(\phi_{NY} \vee \phi_S)$

A crucial difference arises in vF&I's example, for which they propose the LF in (9), where NEG and EXC take different scope relative to the modal.

(9) $[_{TP} \text{ NEG } [_{VP_2} \text{ have to } [_{VP_1} [\text{EXC } [\text{the North End}]_F] \lambda 1 [\text{you go to } t_1]]]]]$

EXC is below *have*, and triggers the same presupposition as in (7) above. Assuming the presupposition projects universally through the modal and over negation, the global presupposition is (10): that in each cheese-world, you go somewhere.

(10) $P: \Box(\phi_{NE} \vee \phi_{NY} \vee \phi_S)$

The presupposition is *compatible* with the intuited weak possibility inference—and, indeed, that very inference derives in combination with the assertion. νP_1 asserts that you go somewhere other than the North End, and the modal and negation integrate to derive (11): that you do not have to go anywhere other than the North End. Combined together, (10) and (11) entail that there are *some* cheese-worlds where you go to the North End (and nowhere else), not that in *all* cheese worlds you go to the North End. By triggering a weak existential presupposition at a low scope site, the necessity inference is weakened to possibility.

(11) $A: \neg\Box(\phi_{NY} \vee \phi_S)$

In sum, vF&I proposal has two ingredients: (a) *only* is decomposed, and (b) it gives rise to a weak existential presupposition. We raise challenges for both.

3 Evidence against decomposition

To assess the viability of decomposing *only* into negation and an exceptive, we will draw upon Spanish. Spanish has an adverbial *solo* which seems to parallel *only*. In addition, Spanish (like other languages that vF&I survey) makes use of an exclusive construction which wears on its sleeve a negation-exceptive structure: *no + más que XP*. *No* is sentential negation, and vF&I characterize *más que* (lit. ‘more than’) as an exceptive. vF&I’s core example is given with *no más que* in (12).

- (12) Para conseguir buen queso, no tienes más que ir al NE.
to get good cheese, not have:2s more than go:INF to-the NE

By comparing *solo* and *no más que*, we will argue that the former is not in fact reducible to the latter. In particular, we show that while *no más que* exhibits characteristic properties of sentential negation, *solo* does not. This calls into question the idea that *solo* contains sentential negation as part of its analysis.

We focus here on licensing of strong NPIs. Just like its English counterpart (Klima 1964), temporal *hasta* in combination with telic event descriptions requires negation in order to be licensed (Bosque 1980). As seen in (13), the sentential negation in *no más que* licenses *hasta*. In contrast, *solo* in (14) does not.¹ If *solo* were decomposed to include sentential negation, it should pattern like *no* and *no más que* and license *hasta*, contrary to fact.

- (13) Juan *(no) apareció hasta las nueve más que una vez.
Juan not showed-up:3s until the nine more than one time
‘Juan only showed up at nine once.’
- (14) *Juan (solo) apareció (solo) hasta las nueve una vez.
Juan only showed-up:3s only until the nine one time

We can make the same point with negative indefinites (‘n-words’, Laka 1990). Spanish is a ‘non-strict’ negative concord language (Giannakidou & Zeijlstra 2017). As such, in post-verbal position, negative indefinites are only licensed with c-commanding negation, as in (15) (or with a c-commanding negative indefinite).

- (15) Juan *(no) visitó ningún barrio con María.
Juan not visited:3s N-one neighbourhood con María
‘Juan didn’t visit any neighbourhood with María.’

In example (16), *no más que* exhibits the same licensing behavior as sentential negation on its own. *Solo*, however, fails to license n-words, as (17) illustrates.

¹ Parallel facts obtain with *tampoco* (‘either’) or postnominal *alguno* (‘any’) (Cepeda 2015).

Keep *only* strong

Again, the divergent behavior of *solo* is surprising, if *solo* includes negation as part of its underlying representation.

- (16) J. *(no) visitó ningún barrio (con nadie) más que con M.
J not visited:3s N-one neighborhood (with N-body) more than with M
'J didn't visit any neighbourhood with anybody other than with M.'
- (17) *Juan (solo) visitó (solo) ningún barrio con María.
Juan only visited:3s only N-one neighborhood with María

To maintain a decompositional analysis of *solo*, an extra caveat would have to be introduced such that the negation contributed by *solo* differs from overt *no* in its ability to license strong NPIs and n-words. Yet, there is evidence that negation in Spanish *is* a valid licenser, at least for n-words, regardless of how it is phonologically realized. Consider (18), where an n-word occurs in subject position.

- (18) Ningún estudiante visitó ningún barrio con María.
No student visited:3s N-one neighbourhood con María
'No student visited any neighbourhood with María.'

Although there is no overt negation, a prominent line of research proposes that preverbal n-word subjects are licensed by a *covert* negation (see Zeijlstra 2016 for an overview). The object in (18) is another n-word, again licensed by the covert negation. The negation that *solo* introduced, then, would have to differ from *both* overt negation and from the covert negation in (18).

If *solo* is not decomposed, the data fall into place. Strong NPIs and n-words are systematically licensed with a c-commanding negation morpheme, regardless of its phonological realization, and no such morpheme is present with *solo*. On this basis, we conclude in favor of a simplex adverbial analysis.

4 Too weak readings

We now evaluate the second piece of vF&I's proposal: weakening the presupposition of *only* to existential. Building on Ippolito 2007, we discuss three cases where this move results in interpretations that are weaker than attested.

4.1 Associating with conjunction (plurals)

The first case is (19), where *only* associates with a conjunction. The intuitive inferences are that John visited the North End and New York, as in (20a), and nowhere else, as in (20b) (where ϕ_x here abbreviates 'that John visited *x*.')

(19) John only visited [the North End and New York]_F

(20) a. $\phi_{NE} \wedge \phi_{NY}$ b. $\neg\phi_S$

If *only* receives the original strong analysis, both inferences are straightforwardly captured, with (20a) deriving from the prejacent presupposition. Concretely, suppose (19) were assigned the LF in (21).

(21) $[_{TP} \text{only}_{strong} [_{VP} [D \text{ [the North End and New York]}] \lambda 1 \text{ [John visited } t_1]]]$

We assume that *and* is interpreted as the sum formation operator in (22). As defined in Link 1983, and_{sum} takes two referential DPs and outputs the mereological sum of their referents, i.e. the sum of the North End and New York in (21).

(22) $[[and_{sum}]] = \lambda x_e. \lambda y_e. x \oplus y$

A covert distributive operator, D, takes the sum provided by the conjunction, and a property, and asserts that the property holds of every atom in the sum, as in (23). As a result, the vP in (21) expresses the proposition that John visited both the North End and New York. *Only_{strong}* presupposes this proposition, capturing (20a).

(23) $[[D]] = \lambda x. \lambda f_{(e,st)}. \lambda w. \forall y \leq_{ATOM} x [f(y)(w)]$

Following Katzir 2007, we assume that alternatives are computed as syntactic objects, which result from replacing the focused element in the prejacent with other elements of equal or lesser structural complexity. The alternatives for *only*'s prejacent in (21) thus express the propositions in (24). Each proposition entailing ϕ_S is excluded in the assertive component, and (20b) is thus derived, as well.

(24) $ALT = \{\phi_{NE}, \phi_{NY}, \phi_S, \phi_{NE \oplus NY}, \phi_{NY \oplus S}, \phi_{NE \oplus S}\}$

A problem arises, however, if the LF in (21) ceded to the vF&I-style LF in (25), with EXC triggering just an existential presupposition.

(25) $[_{TP} \text{NEG} [_{VP} [\text{EXC [the North End and New York]}] \lambda 1 \text{ John visited } t_1]]]$

First, some housekeeping is in order. In order to yield a reasonable assertion with a sum argument, EXC is redefined as (26), in terms of the overlap relation: EXC combines with an entity x and asserts that no entity non-overlapping with x is an f (two entities are non-overlapping just in case they have no common part).²

² Given (6), (25) should presuppose that J. visited somewhere and assert that he visited no place non-identical to the sum $NE \oplus NY$. Switzerland is one such place, so $\neg\phi_S$ follows, but both NE and NY are also non-identical to $NE \oplus NY$, so $\neg\phi_{NE}$ and $\neg\phi_{NY}$ follow, too, contradicting the presupposition. Gajewski (2008) and Hirsch (2016) independently analyzed exceptives with *but* in terms of overlap, and vF&I suggest such a refinement to EXC, too.

Keep *only* strong

$$(26) \quad \llbracket \text{EXC} \rrbracket = \lambda x_e. \lambda f_{(e, st)}. \lambda w : \exists y[f(y)(w)]. \exists z[\neg \text{Overlap}(z, x) \wedge f(z)(w)]$$

Now, the νP in (25) asserts that John visited some entity non-overlapping with the sum of the North End and New York, i.e. Switzerland, and that is negated to derive (20b). The move to $\nu F\&I$'s analysis impacts the presupposition: the νP presupposes that John visited somewhere, which projects over negation, yielding (27a).

$$(27) \quad \text{a. } P: \phi_{NY} \vee \phi_{NY} \vee \phi_S \quad \text{b. } A: \neg \phi_S$$

The presupposition is overly weak. It does not on its own capture (20a), nor does (20a) derive in combination with the assertion. Combined together, (27a) and (27b) results in the disjunctive inference that John visited the North End *or* New York—not the conjunctive inference that he visited both.

$\nu F\&I$ recognize the issue (see their footnote 22) and suggest that the derived disjunctive inference may be pragmatically strengthened to yield the conjunctive inference as an implicature. However, the conjunctive inference does not exhibit the characteristic properties of implicatures: specifically, whereas implicatures are generally defeasible, the conjunctive inference is not, as (28) shows.

$$(28) \quad \text{John only visited the NE and NY. \#In fact, he just visited the North End.}$$

We conclude that (20a) must be derived in the semantics and that the existential presupposition analysis thus under-generates the inference.

4.2 Negation (*neg* > *only*)

In (29), *only* occurs in the scope of negation, resulting in two inferences: that John visited the North End, and that he additionally visited somewhere else.

$$(29) \quad \text{John didn't only visit [the North End]}_F.$$

$$(30) \quad \text{a. } \phi_{NE} \quad \text{b. } \phi_{NY} \vee \phi_S$$

With *only_{strong}*, both inferences are captured. In (31), *only_{strong}* triggers the preadjacent presupposition that John visited the North End, and that projects over negation, deriving (30a). (30b) derives from the assertion. *Only_{strong}* asserts locally at νP_2 that John did not visit New York or Switzerland and, in turn, negation derives the assertion that he did visit one or both places.

$$(31) \quad \llbracket \text{TP not } [\nu P_2 \text{ only}_{strong} [\nu P_1 \text{ John visited [the North End]}_F]] \rrbracket$$

An existential analysis does not match the prediction. $\nu F\&I$ would assign (29) the LF in (32). The top negation in (32) is the one separate from *only*. Beneath that negation, *only* contributes its own negation, along with its exceptive component. The

two negations cancel one another, resulting in the LF in (31) being equivalent to its underlined subconstituent, with no negation head at all.

(32) $[\text{TP not } [\text{VP } [\text{NEG } [\text{EXC the North End } [\lambda 1 \text{ John visited } t_1]]]]]$

Given vF&I's lexical entry for EXC, the underlined constituent in (32) has the presupposition and assertion in (33a) and (33b), respectively.

(33) a. P: $\phi_{NE} \vee \phi_{NY} \vee \phi_S$ b. A: $\phi_{NY} \vee \phi_S$

Because (33b) asymmetrically entails (33a), the amalgam of the presupposition and assertion is equivalent to (33b), and the predicted inference is just that John visited somewhere other than the North End, leaving (30a) unaccounted for. The analysis again goes too far in bleeding prejacent inferences.

4.3 More negation (*only* < *neg*)

Consider now (34) where *only* occurs with negation in its scope. Here, there is an observed inference that John didn't visit the North End, as in (35a), in addition to the further inference that he did visit everywhere else, as in (35b).

(34) John only didn't visit [the North End]_F.

(35) a. $\neg\phi_{NE}$ b. $\phi_{NY} \wedge \phi_S$

Again, *only_{strong}* delivers the right result. The prejacent presupposition is (35a). On the assertive dimension, *only* operates over negative alternatives, expressing $\neg\phi_{NE}$, $\neg\phi_{NY}$, and $\neg\phi_S$. The latter two are excludable, deriving (35b).

(36) $[\text{TP}_2 \text{ only}_{strong} [\text{TP}_1 \text{ not } [\text{VP } \text{John visited } [\text{the North End}]_F]]]$

This time, vF&I's analysis does furnish a possible LF which yields the observed reading, as well. That LF is (37), where the negative and exceptive components of *only* both take scope above the external negation.

(37) $[\text{TP}_2 \text{ NEG } [\text{TP}_1 [\text{EXC the North End } \lambda 1 [\text{not } [\text{VP } \text{John visited } t_1]]]]]$

EXC triggers the existential presupposition that there is some place that John did not visit, as in (38a). For assertion, TP₁ says that there is some place other than the North End that John did not visit. The higher negation thus outputs (38b). Presupposition and assertion together derive the conjunction of (35a) and (35b).

(38) a. P: $\neg\phi_{NE} \vee \neg\phi_{NY} \vee \neg\phi_S$ b. A: $\neg(\neg\phi_{NY} \vee \neg\phi_S) \Leftrightarrow \phi_{NY} \wedge \phi_S$

Keep *only* strong

Still, a complication arises. Because EXC is covert and able to take scope at different sites, vF&I predict an ambiguity in (34). In addition to (37), the LF in (39) should be available too, where the EXCP scopes beneath the lowest negation. Like in (32) above, two negations are adjacent in the structure and cancel one another. As such, presupposition and assertion together convey that John visited somewhere other than the North End—and that fails to entail either (35a) or (35b).

(39) $[\text{TP}_2 \text{ NEG } [\text{TP}_1 \text{ not } [\text{VP} [\text{EXC the North End}] \lambda 1 \text{ John visited } t_1]]]$

(40) a. $P: \phi_{NE} \vee \phi_{NY} \vee \phi_S$ b. $A: \phi_{NY} \vee \phi_S$

vF&I's analysis, then, runs into challenges with both *not* > *only* and *only* > *not*. The problem has a different character in the two cases, however. With *not* > *only*, one LF is predicted, and it yields a too weak reading. With *only* > *neg*, two LFs are predicted, one of which yields the target reading, and the other of which yields a too weak reading. The problem with *not* > *only* is one of under-generation, while the problem with *only* > *not* is one of over-generation.

Over-generation is in general less severe, since it can in principle be resolved by introducing extra constraints. It is unclear, though, what would block (39). First, (39) has the same skeleton as the one that vF&I propose for their core example:

(41) $[\text{TP} \text{ NEG } [\text{VP}_2 \text{ have to } [\text{VP}_1 [\text{EXC the North End}] \lambda 1 \text{ you go to } t_1]]]$

In each case, the negation from *only* scopes at the site where *only* is overtly realized, while EXC scopes below some intervening operator (a modal in (41), the sentential negation separate from *only* in (39)). Since (41) is vF&I's central contribution, they commit to that basic configuration being well-formed.

To block (39), there would have to be some constraint specifically penalizing intervening negation. One possibility is that EXC is an NPI and is only licensed when the *global* environment in which EXC occurs is downward monotonic. In (39) the lower negation does create a downward monotonic environment locally, but the higher negation cancels it. If EXC requires global downward monotonicity, then EXC would be anti-licensed in (39). Yet, it would not be viable to impose such a strong condition on EXC. Consider example (42a), where *only* is grammatical in the antecedent of a conditional. If *only* decomposes into negation and an exceptive, (42a) would have the LF in (42b). Again, NEG creates a downward monotonic environment, but the global environment is not downward monotonic.

(42) a. If John only visited [the NE]_F, he will complain about the tourists.
 b. [If [NEG [EXC the NE] $\lambda 1$ John visited t_1]] [he will complain . . .]

Hence, we will take the over-generation problem seriously as another reason to question vF&I's semantic revision of *only*.

4.4 Taking stock

We have a paradox. On the one hand, for vF&I’s example, *only* must decompose and carry a weak existential presupposition. On the other hand, decomposition is difficult to maintain (Section 3), and a strong prejacent presupposition is necessary in other data (Section 4). Our aim here is to resolve the paradox.

5 Proposal: Strong *only*, external weakener

We take the results of Sections 3 and 4 to reveal that *only* is simplex and strong, as in (1). In this section, we return to vF&I’s example, and reconcile the observed possibility inference with strong *only*. Our approach will yield the same meaning components as vF&I’s, but through importantly different compositional means. Along the way, our analysis will further derive the sufficiency intuition that the North End is an *easy* place to get good cheese.

5.1 Weakening separate from *only*

We propose that a covert weakening operator, AT LEAST, is optionally inserted into *only*’s scope. vF&I’s example has the LF in (43):³

$$(43) \quad [_{\text{TP}} \text{only}_{\text{strong}} [_{\text{VP}_2} \text{have to } [_{\text{VP}_1} \text{AT LEAST [you visit [the North End]}_F]]]]$$

Based on Crnić 2011—which proposed that AT LEAST is available in the scope of *even*—we put forward the lexical entry in (44). AT LEAST is a scalar focus operator. It requires that the focus alternatives in ALT be partially or completely ordered on a contextual scale (\leq), presupposes that its prejacent (p) is lowest-ranked, and asserts that some alternative ranked at least as high as p is true, i.e. that either p or some higher-ranked alternative is true, thus weakening p .

$$(44) \quad \llbracket \text{AT LEAST} \rrbracket^{\text{ALT} \leq} = \\ \lambda p : \forall p' \in \text{ALT}[p' \neq p \rightarrow p' > p]. \lambda w. \exists p'' \in \text{ALT}[p'' \geq p \wedge p''(w)]$$

The existential assertion will help derive the possibility inference in vF&I’s example, and sufficiency will follow from the scalar presupposition.

In (43), AT LEAST operates over alternatives expressing ϕ_{NE} , ϕ_{NY} , and ϕ_S , which are naturally ordered as in (45). The more effort you exert on average at ϕ -worlds,

³ Beaver & Clark 2008 argue that *only* is scalar and that *only* (p) presupposes that p or a higher ranked proposition is true, thus making an ‘at least’ component part of *only* (see also Beaver & Coppock 2014.) We defer discussion of this proposal (see Alonso-Ovalle & Hirsch 2018) and simply note that in the vF&I example the ‘at least’ component needs to be triggered under *only*, as discussed below.

Keep *only* strong

the higher ϕ is ranked. Assuming we start from Boston, it takes the least effort to go to the North End of town, while New York and Switzerland are more effortful.

$$(45) \quad \phi_{NE} < \phi_{NY} < \phi_S$$

The prejacent of AT LEAST in (43) is ϕ_{NE} , which the scalar presupposition requires to be lowest-ranked, as in (46). The presupposition is satisfied, given (45).

$$(46) \quad P: \forall p' \in \text{ALT}[p' \neq \phi_{NE} \rightarrow p' > \phi_{NE}] \quad (\text{scalar } Ps)$$

vP_1 then asserts that you go somewhere at least as effortful as the North End—or, more simply, that you go *somewhere*. In turn, the modal derives as the assertion of vP_2 that in each cheese-world you go somewhere.⁴ *Only_{strong}* takes that proposition as its prejacent, which is globally presupposed, as shown in (47).

$$(47) \quad P: \Box [\text{[AT LEAST]}^{\text{ALT} \leq}(\phi_{NE})] = \Box(\phi_{NE} \vee \phi_{NY} \vee \phi_S) \quad (\text{prejacent } Ps)$$

To determine what *only_{strong}* asserts, consider the alternatives that it ranges over. In the LF in (43), *only* and AT LEAST both associate with the object DP, but operate over different alternatives. As noted earlier, we assume that alternatives are constructed as syntactic objects. *Only*, we propose, operates over the alternatives in (48), each containing AT LEAST. Because AT LEAST is focus-sensitive, F-marking must be retained in the alternatives to identify its associate.⁵

$$(48) \quad \begin{array}{ll} \text{a.} & [\text{have} [\text{AT LEAST} [\text{you visit} [\text{the North End}]_F]]] \quad \Box(\phi_{NE} \vee \phi_{NY} \vee \phi_S) \\ \text{b.} & [\text{have} [\text{AT LEAST} [\text{you visit} [\text{New York}]_F]]] \quad \Box(\phi_{NY} \vee \phi_S) \\ \text{c.} & [\text{have} [\text{AT LEAST} [\text{you visit} [\text{Switzerland}]_F]]] \quad \Box\phi_S \end{array}$$

Each structural alternative expresses the proposition at the end of its line above. While (48a) is equivalent to the prejacent of *only*, (48b) and (48c) are both stronger. *Only* will thus negate the latter two, deriving as the assertion at TP that you do not go to either New York or Switzerland at all cheese-worlds, as in (49).⁶

⁴ In general, presuppositions project universally from the scope of a universal: if p presupposes p' , $\llbracket \text{have} \rrbracket(p)$ presupposes that p' holds at all worlds in the domain of quantification of the modal. One would then expect TP₂ to presuppose that ϕ_{NE} is lowest-ranked in ALT at all cheese-worlds. But the scalar presupposition projects over the modal. Note, however, that this presupposition is world independent and hence either true at all worlds (if ϕ_{NE} is lowest ranked), or false at all worlds (if ϕ_{NE} is higher). If (44) is defined, this presupposition must be true at the evaluation world.

⁵ For reasons of space, we will omit syntactic labels from LFs when we don't need to refer to them.

⁶ AT LEAST in the alternatives should trigger a scalar presupposition: in (48b), that ϕ_{NY} is lower-ranked than ϕ_{NE} or ϕ_S , and in (48c), that ϕ_S is lowest-ranked. If either presupposition were to project globally, presupposition failure would ensue. We must, therefore, commit to the scalar presupposition not obligatorily projecting out of the focus alternatives (see also Crnič 2011).

$$(49) \quad A: \neg\Box(\phi_{NY} \vee \phi_S) \wedge \neg\Box\phi_S \quad (\Leftrightarrow \neg\Box(\phi_{NY} \vee \phi_S))$$

Just like vF&I's analysis, our proposal derives the target possibility inference, $\Diamond\phi_{NE}$. (47) says that at each cheese-world you go somewhere, and (49) that you don't go to New York or Switzerland at all cheese-worlds. It thus follows that, at some cheese-worlds, you go to the North End. Moreover, the scalar presupposition derives sufficiency: given an effort-based scale, the scalar presupposition requires that the prejacent of AT LEAST name the easiest place to go. The counterpart to vF&I's example in (50) is deviant, since ϕ_{SW} is highest ranked by effort, not lowest.

- (50) a. #To get good cheese, you only have to go Switzerland.
 b. [only_{strong} [have [AT LEAST [you visit [Switzerland]_F]]]]

5.2 Comparison with vF&I

In deriving (47) and (49), our proposal achieves the same result as vF&I's, but through different means. To illustrate, directly compare the LFs.

- (51) a. [NEG [have [[EXC the North End] λ 1 [you visit t_1]]]]
 b. [only_{strong} [have [AT LEAST [you visit [the North End]_F]]]]

In both cases the modal is sandwiched between two operators, and the operator below the modal makes an existential contribution. In vF&I's analysis, EXC introduces the presupposition that you visit somewhere, which projects universally through the modal, delivering (47) as a global presupposition. In our analysis, AT LEAST asserts that you visit somewhere, the modal operates on that assertion, and strong *only* converts it to presupposition. As regards assertion, for vF&I, EXC introduces the assertion that you visited somewhere other than the North End, and the modal and negation operate on that proposition to yield (49). For us, (49) results from *only* negating alternatives containing AT LEAST.

Crucially, our proposal differs from vF&I's in two ways: (i) *only* is simplex, and (ii) it triggers a 'strong' prejacent presupposition. Because, under our proposal, *only* is simplex, the challenge for decomposition in Section 3 is neutralized. Moreover, since weakening is outsourced away from *only*, we do not necessarily expect to see weakening in all cases where *only* is present. Weakening crucially depends on the presence of AT LEAST, and there might be cases where AT LEAST is not available. We discuss next some cases where we expect AT LEAST not to be available.

Keep *only* strong

6 Variable weakening = variable AT LEAST

Recall that vF&I's proposal under-generates the prejacent inferences in (52a) and (52b), and that, while it can derive the prejacent inference in (52c), it also over-generates an unattested weak interpretation for that sentence.

- (52) a. John only visited the North End and New York. ($\rightsquigarrow \phi_{NE} \wedge \phi_{NY}$)
 b. John didn't only visit the North End. ($\rightsquigarrow \phi_{NE}$)
 c. John only didn't visit the North End. ($\rightsquigarrow \neg\phi_{NE}$) / ($\rightsquigarrow \phi_{NY} \vee \phi_S$)

Our proposal immediately resolves the *under-generation* problems. Since weakening is not inherent to *only*, but outsourced to a separate optional operator, strong readings are always available. As discussed in Section 4, the target readings are captured by the LFs in (53), which contain strong *only* but no AT LEAST.

- (53) a. [only_{strong} [John visited the North End and New York]]
 b. [not [only_{strong} [John visited the North End]]]
 c. [only_{strong} [not [John visited the North End]]]

Still, the possibility of *over-generation* does remain. Why aren't parses with AT LEAST available, as well? In the following, we move systematically through each case in (52), and conjecture that AT LEAST is blocked for pragmatic reasons.

6.1 Plurals

We believe that AT LEAST is blocked in (52a) because its scalar presupposition is difficult or impossible to satisfy. Consider the LF in (54).

- (54) [only [AT LEAST [John visited [the North End and New York]_F]]]

In (54), AT LEAST operates over the alternatives in (55). Since the underlined alternatives are logically stronger than the others, one natural way to construct a scale is based on entailment, as in (56). With that, however, the scalar presupposition of AT LEAST would fail, since its prejacent ($\phi_{NE \oplus NY}$) is ranked above the weaker individual conjuncts (ϕ_{NE} , ϕ_{NY}).

- (55) $\{\phi_{NE}, \phi_{NY}, \phi_S, \underline{\phi_{NE \oplus NY}}, \underline{\phi_{NE \oplus S}}, \underline{\phi_{NY \oplus S}}\}$

- (56) $\phi_{NE}, \phi_{NY}, \phi_S < \phi_{NE \oplus NY}, \phi_{NE \oplus S}, \phi_{NY \oplus S}$

One could imagine different rankings where ϕ_{NE} would be lowest-ranked, but we conjecture that a scalar operator such as AT LEAST requires ranking to positively correlate with logical strength, as in (57).

(57) A well-formed scale is such that $\forall p, p' [p \subset p' \rightarrow p > p']$.

The LF in (54), then, must lead to presupposition failure. At the same time, AT LEAST should be allowed in vF&I's example, where ϕ_{NE} , the prejacent of AT LEAST, has no weaker alternative. Indeed, the ranking of singular alternatives that we assumed ($\phi_{NE} < \phi_{NY} < \phi_S$) straightforwardly abides by (57), since all of the alternatives are logically independent of one another. The conjecture further predicts that AT LEAST should become unavailable in vF&I's configuration if a conjunction is introduced. The deviance of (58) under a sufficiency reading suggests that this is so.

(58) #To get good cheese, you only have to go to (both) the NE and NY.

6.2 Negation: *only* > *not*

In addressing negation, it will most expedient to start with the case in (52c), where *only* scopes over negation. There are two positions where AT LEAST could occur in the scope of *only* in this case: above negation, as in (59a), or under negation, as in (59b). We'll discuss both possibilities.

(59) a. LF₁: [only_{strong} [AT LEAST [not [John went to [the North End]_F]]]]
 b. LF₂: [only [not [AT LEAST [John visit [the North End]_F]]]]

In LF₁, AT LEAST operates over alternatives expressing the negative propositions $\neg\phi_{NE}$, $\neg\phi_{NY}$, and $\neg\phi_S$. For its scalar presupposition to be met, $\neg\phi_{NE}$ must be lowest-ranked, as in (60). That ranking inversely correlates with the average effort exerted at ϕ -worlds, since, on average, more effort is exerted at $\neg\phi_{NE}$ -worlds than at $\neg\phi_{NY}$ -worlds and, in turn, at $\neg\phi_S$ -worlds.

(60) $\neg\phi_{NE} < \neg\phi_{NY} < \neg\phi_S$

Suppose the ranking in (60) could be constructed, and that the scalar presupposition is thus satisfiable.⁷ Then, LF₁ should be viable. There is no need to block this LF, though, since it yields an unproblematic interpretation. The presupposed prejacent of *only* says that there is somewhere that John didn't go, as in (61a). Negating alternatives derives (61b). Combined, it follows that John didn't go to the

⁷ There is evidence that an inverse effort-based ranking is difficult to construct. If the inverse ranking of positive alternatives in (ii) were available, (i) would be felicitous. In (ii), ϕ_S is lowest ranked, and (i) would presuppose that going to Switzerland is the *hardest* way to get good cheese. By extension, the ranking in (60) might be difficult too, in so far as it requires an ordering inversely proportional to effort. If (60) is unavailable, failure of the scalar presupposition would block insertion of AT LEAST.

(i) # To get good cheese, you only have to go to Switzerland. (ii) $\phi_S < \phi_{NY} < \phi_{NE}$

Keep *only* strong

North End, but went everywhere else, as observed in (52c).

- (61) a. P: $\neg\phi_{NE} \vee \neg\phi_{NY} \vee \neg\phi_S$
 b. A: $\neg\llbracket\text{AT LEAST}\rrbracket(\neg\phi_{NY}) \wedge \neg\llbracket\text{AT LEAST}\rrbracket(\neg\phi_S)$ ($\Leftrightarrow \phi_{NY} \wedge \phi_S$)

We now turn to LF₂. When AT LEAST is below negation, it operates over positive singular alternatives, and its scalar presupposition is satisfied with the familiar effort-based ranking. A pathology does arise, however. Locally, AT LEAST weakens the complement of negation. Since negation is an entailment reversing operator, however, the overall prejacent of *only* is *strengthened* by the presence of AT LEAST. As shown in (62), the presupposed prejacent conveys that John went *nowhere*.

- (62) P: $\neg\llbracket\text{AT LEAST}\rrbracket^{\text{ALT}\leq}(\phi_{NE})$ ($\Leftrightarrow \neg\phi_{NE} \wedge \neg\phi_{NY} \wedge \neg\phi_S$)

As a result, all of the alternatives *only* sees other than the prejacent—in (63)—are weaker than the prejacent. Hence the problem: because *only* selectively negates non-weaker alternatives, there are *no* excludable alternatives, and the assertive component of *only* is trivialized. In particular, the assertion is a tautology: *only* says that every non-weaker alternative is false, and that is trivially true when there are none.

- (63) a. $\neg\llbracket\text{AT LEAST}\rrbracket^{\text{ALT}\leq}(\phi_{NE}) \Leftrightarrow \neg\phi_{NE} \wedge \neg\phi_{NY} \wedge \neg\phi_S$
 b. $\neg\llbracket\text{AT LEAST}\rrbracket^{\text{ALT}\leq}(\phi_{NY}) \Leftrightarrow \neg\phi_{NY} \wedge \neg\phi_S$
 c. $\neg\llbracket\text{AT LEAST}\rrbracket^{\text{ALT}\leq}(\phi_S) \Leftrightarrow \neg\phi_S$

We propose that LF₂ is not detected precisely because its assertion is trivial. This fits with a broad, well-established pattern. It has been proposed that trivial meanings (due to contradiction) arise with strong determiners in existential *there* constructions (Barwise & Cooper 1981), exceptive *but* with certain quantifiers such as existentials (von Stechow 1993); comparative quantifiers in the scope of *only* (Fox & Hackl 2006); and negative islands (Fox & Hackl 2006); among other cases. In each case, triviality leads to ungrammaticality (for a generalization, see Gajewski 2002).

In sum, when *only* scopes over negation, there are two possible LFs with AT LEAST and neither raises an over-generation worry. LF₁ yields a reasonable interpretation (or is unavailable due to its scalar component) and LF₂ is blocked.

6.3 More negation: *not* > *only*

The final case to consider is (52b), where negation scopes over *only*. A possible LF with AT LEAST in the scope of *only* is (64), interpreted as (65a) and (65b).

- (64) [not [only [AT LEAST [John visited [the North End]_F]]]]

- (65) a. P: $\phi_{NE} \vee \phi_{NY} \vee \phi_S$

$$\text{b. } A: \neg(\neg[[\text{AT LEAST}]]^{\text{ALT}\leq}(\phi_{NY}) \wedge \neg[[\text{AT LEAST}]]^{\text{ALT}\leq}(\phi_S)) (\Leftrightarrow \phi_{NY} \vee \phi_S)$$

As we have seen before, when discussing the interpretation that vF&I predict for (52b), the amalgam of presupposition and assertion in (65) is equivalent to the assertion in (65b). This meaning is not attested: (52b) conveys that John went to the North End, but neither the presupposition, nor the amalgam of presupposition and assertion, derive this inference. The predicted meaning is not pathological, this time, though. Why is it blocked, then?

We suspect that (65) is blocked due to a competition with the parse without AT LEAST, which is repeated in (66), together with its predicted interpretation in (67).

(66) [not [only [John visited [the North End]_F]]]

$$(67) \quad \text{a. } P: \phi_{NE} \qquad \text{b. } A: \neg(\neg\phi_{NY} \wedge \neg\phi_S) (\Leftrightarrow \phi_{NY} \vee \phi_S)$$

Despite differences in presupposition, there is a crucial similarity between the meanings in (65) and (67): in both cases, the assertion is identical. We conjecture that the parse without AT LEAST is preferred because it is structurally simpler, and that the parse with AT LEAST is available only when its assertion differs from that of the simpler parse in some appropriate way.

Although AT LEAST locally weakens its prejacent, we conjecture that AT LEAST must not lead to a weaker *global* assertion.⁸ There are different ways of formulating the constraint consistent with the data. For concreteness, we put forward (68), which invokes von Stechow's (1999) notion of Strawson entailment in order to isolate assertion—as defined in (68), Strawson entailment evaluates entailment, assuming that all presuppositions are met.

(68) Let LF₁ be of the form [... AT LEAST [X] ...].
 Let LF₂ be of the form [... [X] ...]
 (where LF₂ replaces AT LEAST [X] in LF₁ with [X].)
 LF₁ is disallowed (or dispreferred) if [[LF₂] Strawson entails [[LF₁]].

(69) If α and β are of type $\langle s, t \rangle$, α Strawson entails β iff
 for all w s.t. $w \in \text{dom}(\alpha)$ and $w \in \text{dom}(\beta)$, $\alpha(w) \rightarrow \beta(w)$.

The constraint in (68) blocks AT LEAST in cases where its absence results in an equivalent global assertion, as is the case in (64). The LF in (64) should be blocked, given (68), since its competitor in (66) Strawson entails it (in fact, in this case, both LFs are Strawson equivalent.)

The anti-weakening conjecture rightly allows AT LEAST in vF&I's example. While AT LEAST weakens presupposition, it does strengthen the global assertion in that case. The parse is repeated in (70a), along with a competitor without AT

⁸ We thank Gennaro Chierchia for helpful discussion of this idea.

Keep *only* strong

LEAST. Whereas the assertion in (70a) requires that neither ϕ_{NY} nor ϕ_S hold at some cheese-worlds, that in (70b) is compatible with all cheese-worlds being either ϕ_{NY} - or ϕ_{NE} -worlds. (70a) Strawson entails (70b) (and not vice versa.)

- (70) a. [only [have [AT LEAST [John visited [the North End]_F]]]]
 \rightsquigarrow A: $\neg\Box(\phi_{NY} \vee \phi_S)$
 b. [only [have [John visited [the North End]_F]]]
 \rightsquigarrow A: $\neg\Box(\phi_{NY}) \wedge \neg\Box(\phi_S)$

In addition to blocking (64), note that the anti-weakening conjecture also blocks both LF₁ and LF₂ from the preceding section. The assertion of LF₁, repeated as (71a), is equivalent to that of the AT LEAST free competitor in (71b). Since the competitor Strawson entails LF₁, LF₁ is blocked.

- (71) a. [only [AT LEAST [not [John visited [the North End]_F]]]] (LF₁)
 \rightsquigarrow A: $\neg\llbracket\text{AT LEAST}\rrbracket(\neg\phi_{NY}) \wedge \neg\llbracket\text{AT LEAST}\rrbracket(\neg\phi_S)$ ($\Leftrightarrow \phi_{NY} \wedge \phi_S$)
 b. [only [not [John visited [the North End]_F]]]
 \rightsquigarrow A: $\neg\neg\phi_{NY} \wedge \neg\neg\phi_S$ ($\Leftrightarrow \phi_{NY} \wedge \phi_S$)

The competition involving LF₂ is shown in (72). Granting presuppositions, the truth of any proposition trivially guarantees the truth of a tautology, since the tautology is always true. Hence, the competitor in (72b) necessarily Strawson Entails tautologous LF₂, which is accordingly blocked.

- (72) a. [only [not [AT LEAST [John visited [the North End]_F]]]] (LF₂)
 \rightsquigarrow A: \top (tautology)
 b. [only [not [John visited [the North End]_F]]]
 \rightsquigarrow A: $\neg\neg\phi_{NY} \wedge \neg\neg\phi_S$ ($\Leftrightarrow \phi_{NY} \wedge \phi_S$)

Neither result argues *for* the conjecture in (64), but neither result is unwelcome either. While LF₁ is unproblematic, blocking it is equally unproblematic: the LF without AT LEAST can generate the observed interpretation on its own. LF₂ was already blocked by general constraints against triviality, and the competition logic from the anti-weakening conjecture converges with those general constraints.

In sum, the anti-weakening conjecture is consistent with the data. It is also notably reminiscent of constraints on other operators. In particular, Chierchia et al. (2012) observe that the covert strengthener, EXH, is not licensed in environments where it would lead to a weaker overall assertion, such as the scope of negation. Perhaps, in general, parses with a covert operator are allowed over a simpler parse without the operator only if they have a non-weaker assertion.

Overall, we have suggested that AT LEAST is blocked with plurals and negation

for pragmatic reasons. In particular, the scalar presupposition of AT LEAST is difficult to satisfy with plurals, and a global anti-weakening requirement blocks AT LEAST with negation (convergent with other constraints, in certain cases). In this way, over-generation concerns are addressed.⁹

7 Conclusion

We started with vF&I’s observation that a necessity modal in the scope of *only* can result in a global possibility inference, and argued against vF&I’s proposal that the source of weakening is *only* itself.

In our analysis, *only* is a simplex adverbial, which triggers a strong prejacent presupposition, and weakening is outsourced to a separate covert operator, AT LEAST, which may take scope between *only* and the modal. Crucially, AT LEAST is optional, and not always available: with plurals and negation, AT LEAST is pragmatically blocked, and prejacent inferences emerge.

To conclude, we flag two avenues for future investigation. First, our discussion in Section 6 focused on restricting the distribution of AT LEAST within the scope of *only*—the environment where we argued AT LEAST does occur in vF&I’s example. We leave it to future work to study the distribution of AT LEAST in other environments. At present we are uncertain whether AT LEAST is ever attested outside the scope of another focus operator.

Second, weakening is not limited to constructions with overt *only*, but observed in certain other exhaustive focus constructions, as well. As noted by Vincent Homer and Bernhard Schwarz (p.c.), the copular construction in (73) again conveys that going to the North End is just one (easy) way of getting good cheese (see Homer (to appear)).

(73) To get good cheese, all you have to do is go to the North End.

Weakening in the absence of *only* is broadly supportive of our approach. Still, we leave it as a matter for future research to develop a full compositional analysis of (73) with AT LEAST, and to study the distribution of weakening in exhaustive copular constructions more generally.

⁹ Certain modals do not exhibit weakening in vF&I’s configuration: (i), for instance, conveys the universal claim that in all want-worlds you go to the NE. This is predicted: in (i) AT LEAST would not lead to weakening, because *want* is NEG-raising. (ii) should presuppose that you want to go somewhere, and assert (iiia), strengthened to (iiib). This, together with presupposition, derives the universal claim. We leave further study of which modals exhibit weakening to future work.

(i) I only want to go to the North End. (ii) [only [want [AT LEAST [I go to the NE]]]]
 (iii) a. $\neg\Box(\phi_{NY} \vee \phi_S)$ b. $\Box(\neg(\phi_{NY} \vee \phi_S)) \Leftrightarrow \Box(\neg\phi_{NY} \wedge \neg\phi_S)$

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