

ANATOMY OF A MODAL*

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I. INTRODUCTION

Imagine that you come to visit us in Boston. You want to make some tiramisu for us but you complain that you cannot find good mascarpone, nor for that matter any other good cheese in Boston. Incensed, we answer (1), followed by (2).

- (1) What do you mean you can't find good cheese in Boston??!!
- (2) To find good cheese you only have to go to the North End!

What do we convey with (2)? We somehow manage to say at least the following: going to the North End is (part of) a way of finding good cheese and going to the North End is relatively easy. Furthermore, we are leaving it open whether there are other places (in Boston) to get good cheese, that is, with (2) we are not claiming that the North End is the only place to find good cheese.

At first glance at least, (2) seems to say that going to the North End is *enough* or *sufficient* to find good cheese, so we will call the construction in (2) that combines *only* and *have to* the SUFFICIENCY MODAL CONSTRUCTION (SMC).

In the remainder of this introduction, we will sketch briefly how this construction is constructed cross-linguistically. In Section 2, we will show that the construction presents us with a compositionality puzzle. In Section 3, we proceed gradually

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towards a compositional analysis. In Section 4, we tie up some loose ends and explore whether the SMC really expresses sufficiency, how easiness enters into its meaning, and whether there is reason to use “more than” in its semantics. Finally, in Section 5, will explore in some detail the various ingredients that go into the construction in numerous languages and discuss further connections.

1.1 *The Sufficiency Modal Crosslinguistically*

In (2), the SMC morphosyntax consists of the modal verb *have to* and the element *only*. Crosslinguistically, the SMC consists of the following ingredients:

- A modal verb (*have to* in (2))
- and one¹ of
 - an element like *only*² (the “*only* languages”: English, German, Finnish, Spanish and more), or
 - negation and an exceptive phrase (the “NEG + Exceptive languages”: Greek, French, Spanish and more)

We already saw in English an example of an *only* language. Below are examples from Greek, French, and Irish, three NEG + Exceptive languages:³

- (3) An thelis kalo tiri dhen echis para na pas sto North
 If want/2sg good cheese NEG have/2sg except NA go/2sg to-the North
 End
 End
 “If you want good cheese you only have to go to the North End”

¹ Some languages (e.g. Spanish) fall in both categories, i.e. they can either use *only* or the NEG + Exceptive form.

² Related elements like *just*, *merely*, and the somewhat archaic *but* can also serve this purpose in English:

- (i) You just/merely have to go to the North End.
 (ii) You have but to go to the North End.

We also can express something similar to the SMC with *at most*:

- (iii) You at most have to go to the North End.

Based on the productivity of ways of expressing the SMC, we would want to insist on a compositional analysis, rather than some kind of lexical stipulation.

³ French data are from Valentine Hacquard, pc. Irish data are from Jim McCloskey, pc.

- (4) Si tu veux du bon fromage, tu n'as qu'à aller à NE
 if you want of good cheese you not-have except-to go to-the NE
- (5) Más cáis atá uait, níl agat ach a dhul go Co.
 if+COP cheese C+is from-you NEG+is at-you but go[-FIN] to County
 Chorcaigh
 Cork
 "If it's cheese you want, you only have to go to County Cork."

At first blush, it seems intuitive that *only* can do the same job as NEG + Exceptive. After all, the following are equivalent:

- (6) Only John came.
 (7) Nobody came except John.

However, we will see that, as always, things are not as simple as they seem.

The SMC does not just occur in standard Indo-European languages. Here is an example from Tagalog (courtesy of Norvin Richards, pc):

- (8) Kung gusto mong bumili ng mainam na keso, kailangan mo lang
 if want you-C buy tasty cheese need you only
 pumunta sa North End
 go to North End

And here is one from Finnish (from Liina Pylkkänen, pc):

- (9) Jos halua-t hyva"a" juusto-a, sinu-n on vain menta"va"
 If want-2sg good-part cheese-part, you-gen is only go-part
 North End:iin
 NE-illative

And here is one from Hebrew (from Danny Fox, pc):

- (10) ?ata rak carix lalexet larexov hasamux kede? limco gvina tova.
 You only need to-go to-the-street the-near-by in-order to-find cheese good
 'In order to find good cheese, you only need to go to the near-by street'

And finally an example from Arabic (from Abbas Benmamoun, pc):

- (11) Yla bgiti lhut ma-XeSsak/lazzem tamshi ?illa ltemma
 If want fish neg-need/should go except there
 'If you want fish you only need to go there'

1.2 *Some Frames in which the SMC Appears*

We have found three environments in which the SMC tends to appear:

- In construction with a purpose clause:

(12) To get good cheese you only have to go to the North End.
- In what have been called ANANKASTIC conditionals (see Sæbø [38], von Fintel & Iatridou [14], von Stechow et al. [39], Huitink [23], Nissenbaum [30]):

(13) If you want good cheese you only have to go to the North End.
- In what we would like to call “causal conjunction”:

(14) You only have to go to the North End and you will find good cheese.

For the purposes of this paper we will mostly be using examples with purpose clauses, although the comparison with the causal conjunction cases will prove crucial at a certain point.

2. THE COMPOSITIONALITY PUZZLE

Ideally, we would just reach for existing off-the-shelf analyses of the crucial components of the SMC and once assembled according to standard composition principles, they would result in the sufficiency meaning that the SMC has. Unfortunately, if we follow that recipe, we will not get the right result, as we will demonstrate in this section. We will start by looking at the modal component of the SMC and then at the exceptive/exclusive element.

2.1 *The Modal in the SMC*

Let’s look at a sentence very much like our paradigm sentence, but taking out the exceptive/exclusive element:

- (15) To find the best canoli, you have to go to Sicily.

We will assume a more or less standard possible worlds semantics for modals like *have to*. In particular, we assume that *have to* is a necessity modal which effects universal quantification over a set of worlds (its modal base). In our paradigm examples, the modal base is given by the interplay of a CIRCUMSTANTIAL accessibility relation (using terminology from Kratzer [25, 26]) and the infinitival purpose clause.

The worlds we are quantifying over are those where the facts (circumstances) about cuisine, culture, intercontinental trade, the quality of American supermarkets etc. are the same as here in the actual world. This set of worlds is then further restricted by the purpose clause to those worlds where you find the best canoli. (15) therefore conveys that given the way that the circumstances are, all of the worlds where you find the best canoli are such that you go to Sicily. In other words, going to Sicily is a *necessary* condition for finding the best canoli.

We note that (15) clearly conveys that finding the best canoli is a goal or desire and therefore the sentence expresses a kind of GOAL-ORIENTED (OR TELEOLOGICAL) modality. However, we should emphasize that it is not the modal *have to* that is the source of the goal-orientation; instead, it is the infinitival purpose clause that signals that finding the best canoli is a goal. This will be important when we look at the causal conjunction cases, where there is no goal-orientation implied.⁴

We have so far only given SMC examples with the POSSESSIVE MODAL⁵ *have to*. But other modals can be involved in the expression of goal-oriented modality. In particular, there are other modals with (quasi-)universal force such as *need to*, *must*, *ought*, and *should*. Which ones can participate in the SMC?

In English, the modal *need* can also be the verbal element in the SMC, in all environments that we find it in

- (16) a. To get good cheese you only need to go to the North End
 b. If you want good choose you only need to go to the North End
 c. The skies need only to darken a little bit and my dog runs under the table

But other goal-oriented modals with universal force cannot do it:

- (17) *If you want good cheese you (only) must (only) to go to the North End
 (18) *If you want good cheese you (only) ought (only) to go to the North End
 (OK on different reading)
 (19) *If you want good cheese you (only) should (only) to go to the North End
 (OK on different reading)

⁴ The fine details of the semantics of the modals involved here are explored further in our “Harlem” paper [14].

⁵ By “possessive modal” we mean the modal verb that is pulled morphologically from the morphosyntax that expresses possession in the language. Languages expressing possession with *have* often use *have* as a modal. Languages expressing possession with *be to* often use *be to* as a modal. See Bhatt [6].

And no modal with existential force like *can* or *may* can yield the SMC reading, even though at least *can* has a goal-oriented reading:⁶

- (20) If you want good cheese, you can go to the North End
 (21) *If you want good cheese you (only) can / may (only) to go to the North End (OK on different reading)

In short, in English, a modal verb can be a participant in the SMC only if it has universal force, yet, not all universals will do. Indeed, in all languages that we have looked at, there is no modal verb with existential force to be found in the SMC. And like in English, not all modals with universal force will do either.

In Greek, we find a similar situation in that the modal glossed as ‘must’ cannot participate in the SMC, even though it is fine in the plain goal-oriented reading:

- (22) An thes kalo tiri prepi na pas sto North End
 If want/2.sg good cheese must na go/2.sg to-the North End
 ‘If you want good cheese you must go to the North End’
 (23) *An thes kalo tiri dhen prepi para na pas sto North End
 If want/2.sg good cheese NEG must except na go/2.sg to-the North End

But as in English, the universal modal that glosses as ‘need’ can be part of the SMC:

- (24) An thes kalo tiri dhen chriazete para na pas sto North End
 If want/2.sg good cheese NEG need except na go to-the North End
 ‘If you want good cheese you only need to go to the North End’

Similarly, Hindi has two modals with universal force, one that we will gloss as ‘be-to’ (this is Hindi’s “possessive modal”) and one that we will gloss as ‘should’:

- (25) agar tum sacmuch yeh exam paas kar-naa caah-te ho, to
 if you truly this exam pass do-Inf want-Hab.MPl be.Prs.2Pl, then
 tumhen kaRii mehnat kar-nii caahiye
 you.Dat hard.f hardwork.f do-Inf.f should
 ‘If you truly want to pass this exam, you should work hard.’
 (26) agar tum sacmuch yeh exam paas kar-naa caah-te ho, to
 if you truly this exam pass do-Inf want-Hab.MPl be.Prs.2Pl then
 tumhen kaRii mehnat kar-nii ho-gii
 you.Dat hard.f hardwork.f do-Inf.f be-Fut.f
 ‘If you truly want to pass this exam, you will have to work hard.’

⁶ Once we have our semantic analysis fully in place, the astute reader will easily see why (21) doesn’t have an SMC reading.

However, only ‘be-to’ can be used in the SMC:

- (27) Ram-ko ghar aa-naa-hii thaa ki baccoN-ne ro-naa shuruu kar
 Ram-Dat home come-Inf-only be.Pst that children-Erg cry-Inf start do
 di-yaa
 GIVE-Pfv
 ‘Ram had only to come home and the children started crying.’
- (28) *Ram-ko ghar aa-naa-hii caahiye thaa ki baccoN-ne ro-naa
 Ram-Dat home come-Inf-only should be.Pst that children-Erg cry-Inf
 shuruu kar di-yaa
 start do GIVE-Pfv

The modal verbs *have to*, *need*, *echo*, Greek ‘need’, Hindi ‘be-to’ pattern together in being able to participate in the SMC modal while *must*, *ought to*, *should*, Greek ‘must’ and Hindi ‘should’ pattern together in not being able to. Why would this be? What else splits the universal modals in a similar way?

It appears that their scoping properties with respect to negation does. The modals that can occur in the SMC scope *under* negation:

- (29) a. He doesn’t have to go there NEG > modal (deontic)
 b. He doesn’t have to have done that NEG > modal (epistemic)
 c. If you want good cheese you don’t have to go to the NE. NEG >
 modal (goal-oriented)
 d. He doesn’t need to do that NEG > modal
 e. He need not do that NEG > modal
- (30) Dhen chriazete na figis
 NEG need na leave
 ‘You don’t need to leave’ NEG > modal (deontic)
- (31) tumhen Dilli nahiiN jaa-naa hai
 you.Dat Delhi Neg go-Inf be.Prs
 ‘You don’t have to go to Delhi.’ [You don’t have an obligation to go to Delhi.
 Neg > have to]

On the other hand, the universal modals that cannot occur in the SMC scope *over* negation:

- (32) You should not leave modal > NEG (deontic)
 (33) He should not be there now modal > NEG (epistemic)
 (34) He must not leave modal > NEG (deontic)

- (35) He must not be there now modal \succ NEG (epistemic)
- (36) You ought not to leave modal \succ NEG (deontic)
- (37) Dhen prepi na ine eki
NEG must be there
'He must not be there' modal \succ NEG (epistemic)
- (38) Dhen prepi na to kanume afto)
NEG must it do thi
'We must not do this' modal \succ NEG (deontic)
- (39) prepi na min ine eki
must NEG be there
'He must not be there' modal \succ NEG (epistemic)
- (40) tumhen Dilli nahiiN jaa-naa caahiye
you.Dat Delhi Neg go-Inf should
'You should not go to Delhi.' [should \succ not]

The same results hold for all the languages that we have investigated in this regard.
So here is our generalization on this matter:

- (41) Universal modal verbs can participate in the SMC only if they scope under negation.

We have found no counterexample to this.⁷ Which modals scope under negation in a given language depends on a lot of factors and seems very idiosyncratic (see Picallo [34], Cormack & Smith [8] and others). For example, English *must* scopes over negation, as we just saw, while German *müssen* scopes under it:

- (42) Du musst das nicht machen
You must that not do
'You don't have to do that' NEG \succ modal (deontic)

But even in the face of such capriciousness, the generalization above seems to hold absolutely. For example, unlike English *must*, German *müssen* can appear in the SMC:

- (43) Du musst nur ins North End gehen
you must only in-the North End go

⁷ It should be noted though that this is a necessary but probably not sufficient condition. That is, there may be necessity modals that scope under negation but cannot give rise to an SMC interpretation. We have some suggestive data from Hebrew and Norwegian but cannot pursue this here.

Finally, note that languages sometimes have modals that appear specialized for occurrence under negation, sometimes called NPI MODALS, see for example German *brauchen*:

(44) Du brauchst das nicht machen
 you need that not do
 ‘You don’t have to do that.’

(45) *Du brauchst das machen

This item can be used in the SMC, as expected by now:

(46) Du brauchst nur ins North End gehen
 You need only in-the North End go

Given the facts we have surveyed in this subsection, what have we learned about the composition of the SMC? We have seen that the modal in the SMC has to be a necessity modal that can scope under negation.⁸

2.2 *The Exclusive/Exceptive Marker in the SMC*

Next, we need to look at the other characteristic ingredient of the SMC, the exceptive/exclusive marker, crosslinguistically an element like *only* or a NEG + Exceptive combination.

The benchmark analysis of *only* goes back to Horn’s 1969 CLS paper [21], where he argues for two distinct components. A sentence like

(47) Only John was in the room.

ASSERTS that nobody other than John was in the room and PRESUPPOSES that John was in the room.

In general, given a sentence ϕ (the so-called PREJACENT), *only* ϕ will assert that no alternative to ϕ is true and will presuppose that the prejacent ϕ is true. For (47), the prejacent is (48):

(48) John was in the room.

⁸ Apparently, in Norwegian, bare verbs can form SMC, as pointed out to us by Tarald Taraldsen. Many thanks for discussion of this and related points to Anders Holmberg, Oystein Nilsen, and Peter Svenonius. A relevant example is this:

(i) hvis du vil til Oslo er det bare aa sette seg paa toget
 if you want to Oslo is it only to sit RFL on the-train
 ‘If you want to go to Oslo, you only have to get on a train.’

The set of relevant alternatives is as usual contextually determined. Rooth argued in his dissertation [36] that the focus structure of a sentence helps to signal what the relevant alternatives are. For (47), alternatives could be *Mary was in the room*, *Susan was in the room*, etc. For now, we will proceed with these background assumptions regarding *only*.

Looking at the NEG + Exceptive languages, we will take the proposition without NEG + Exceptive to be the prejacent. Just like with *only*, the truth of the prejacent is also conveyed in the NEG + Exceptive construction. Consider (49a) and (50a) and their prejacent propositions (49b) and (50b), which are clearly presupposed or entailed:

- (49) a. Dhen irthe para mono o Yanis
NEG came except only the Yanis
'Nobody came except Yanis'
b. Irthe o Yanis
came the Yanis
'Yanis came'
- (50) a. Dhen idha para mono ton Yani
neg I-saw except only the Yani
'I didn't see anyone except Yani'
b. Idha ton Yani
I-saw the Yani
'I saw Yani'

We said earlier that intuitively, it is obvious that *only* and NEG + Exceptive should be able to set up the same proposition, since the pair in (51) seems equivalent:

- (51) a. Only John was in the room.
b. Nobody was in the room except John.

So, applying this to both the English (47) and the Greek (49a), it is intuitive that we describe them as having the same prejacent, namely that John was in the room.

2.3 *The Prejacent Problem*

With these assumptions in place, let us consider our paradigm example in an *only*-language:

- (52) To find good cheese, you only have to go to the North End.

We will proceed the way we would with any sentence containing *only*. We have to identify the set of relevant alternatives that *only* is operating on (for the assertion), and we have to identify the prejacent (for the presupposition). To identify the set of alternatives we need to determine the focus of *only*. It would appear that the natural focus in such examples is on the infinitival complement of the modal. So, we would expect the alternatives to be propositions like that you have to go to Milan, that you have to go to Reykjavik, that you have to order from amazon.com, etc.

Given such a set of alternatives, (52) would then assert that none of these alternatives is true. That is, to find good cheese, you do not have to go to Milan, you do not have to go to Reykjavik, and you do not have to order from amazon.com. This prediction seems to be just right – the SMC does convey that other ways of achieving one’s goal may exist but are not necessary.

As for identifying the prejacent, for (52), this would be (53) (basically (52) without *only*):

(53) To find good cheese you have to go to the North End.

And here is where the problem lies. In the previous section we saw that the standard analysis of *only* includes the truth of the prejacent as a presupposition. But in the SMC, the prejacent is not automatically understood to be true. We can correctly utter (52) in a situation where there are other places in the Boston area to get good cheese, as long as going to the North End is relatively easy. But then (53) is not true because according to it the only place to get good cheese in the Boston area is the North End.

We will call this THE PREJACENT PROBLEM and we take this to be the central problem for the compositional analysis of the SMC.

The Prejacent Problem arises regardless of the morphosyntax of the SMC. We can also set up the equivalent of the Prejacent Problem in languages that use NEG + Exceptive in the SMC. Following the assumptions in the previous section, the prejacent of (54) is (55), i.e. (54) without NEG and Exceptive:

(54) ya na vris kalo tiri dhen chriazete para na pas sto North End
to na find good cheese NEG need except na go to-the North End

(55) ya na vris kalo tiri chriazete na pas sto North End
to na find good cheese need na go to-the North End

The problem again is that (54) does not entail or presuppose (55), since according to the latter you need to go to the North End to find good cheese. That is, according to (55) the only place where you can find good cheese in the Boston area is the North End, while (54) is fully compatible with there being many such places.

In short, the Prejacent Problem surfaces no matter how the SMC is constructed morphosyntactically. It is a problem of compositionality. Any analysis of the SMC will have to deal with this issue.

Here are some quick attempts at solving the issue which will show that this is not easy. One might think that perhaps the problem lies with the assumption that sentences with *only* and NEG + Exceptive sentences presuppose (or entail) their prejacent. What if at least in the SMC, the prejacent presupposition is cancelled in some way? One might say that any appearance of a prejacent entailment is due to some kind of defeasible implicature and for some reason or other, the implicature does not arise in the SMC. Our paradigm sentence would then simply claim that to find good cheese, you do not have to go to Milan, you do not have to go to Reykjavik, and you do not have to order from amazon.com, and so on. There would be no presupposition that to find good cheese you have to go to the North End.

The problem is that we would now have no obvious way of deriving that going to the North End is in fact a way of getting good cheese (the component of meaning we called SUFFICIENCY). Imagine that both Milan and Reykjavik are very good places to find good cheese, but that the North End is not. Then the SMC claim would – as it now stands – be incorrectly predicted to be true, since you don't *have to* go to Milan (you can go to Reykjavik) and you don't *have to* go to Reykjavik (you can go to Milan). This is not good.

Another possibility would be to claim that the presupposition triggered by *only* and NEG + Exceptive is weaker than we thought. In fact, Horn in his 1996 paper [22] proposes that the presupposition carried by *only* sentences is weaker than he had originally suggested in his 1969 paper. The idea is that *only* ϕ asserts that within a given set C no alternative to ϕ is true and presupposes that there is an element in C that *is* true (without saying that it is ϕ that is true).

Note that – as is – this makes no new and improved predictions for unembedded cases of *only*. If something is true and no alternative to ϕ is true, then it must be ϕ that is true. Indeed, Horn's arguments for his new analysis all hinge on embedded occurrences of *only*, which doesn't appear to be what we have in the SMC. Again, no luck.

We see that playing with the prejacent presupposition of *only* and NEG + Exceptive does not obviously lead to a solution to the compositionality puzzle.

* * *

At this point, one might wonder what our options are, given that we combined what seemed like independently motivated existing analyses of the apparent key components of the construction. Abstractly, enlightenment could come from playing with any or all of the following:

- (i) The nature of the underlying modal (e.g. maybe it is not a necessity modal after all)
- (ii) The semantics of *only* and of NEG + Exceptive (e.g. maybe we need to rethink the exact nature of the prejacent presupposition after all, although we just saw that there are obstacles)
- (iii) The logical structure of the construction (e.g. maybe the components are not what we thought they were or maybe they do not scope quite in the way we thought they did)

The puzzle we are faced with is not one that has previously been treated. Our solution will combine aspects of options (ii) and (iii). We propose that the solution can be found by looking closely at the NEG + Exceptive type of SMC, which we will now do.

2.4 Precursors

Apart from unpublished lecture notes by von Stechow, where he cites relevant passages in the work of Gunnar Bech and where he ends up resorting to a non-compositional solution to our puzzle, we have been made aware of an intriguing passage in a paper by Beck & Rullmann [4: p. 261], which briefly touches on the notion of sufficiency:

We suggest that (30) means (31a) or equivalently (31b):

- (30) Four eggs are sufficient (to bake this cake).
- (31) a. It is not necessary (given the rules for your cake baking) that you have more than four eggs.
- b. It is possible (given the rules for your cake baking) that you have only four eggs.

We will derive this semantics via the lexical meaning of *sufficient*. We will take as our guideline the paraphrase in (31b). We will assume that semantically the argument of *sufficient* is propositional in nature. *Sufficient* then contributes modal possibility as well as a meaning component amounting to *only*.

Note also that their example could easily be rephrased as an SMC sentence:

- (56) You only need (to have) four eggs. (Beck, pc)

What Beck & Rullmann are doing in the quoted passage is unpacking the notion of sufficiency into two complex paraphrases:

- I. possibility \succ *only*

2. negation \succ necessity \succ *more than*

Beck & Rullmann adopt as their working analysis of the notion of sufficiency the first structure where we have possibility scoping over *only*. We do not think that we can work with this structure as an analysis of the SMC (in either of its two variants), for two reasons: (i) in the SMC, *only* appears to have scope *over* not under the modal, not just because of its surface position but also because, as we have seen, the SMC is restricted to modals that scope under negation, a crosslinguistically stable fact, (ii) the SMC clearly contains a necessity modal and not a possibility modal, again a crosslinguistically stable fact, as we have seen.

So, contrary to Beck & Rullmann, we have come to the conclusion that something like the three-part structure option 2 of Beck & Rullmann lies behind the mystery of the SMC. We will develop this in what follows. Again, we should emphasize that Beck & Rullmann intended their discussion to be about the hidden logical structure of the lexical item *sufficient* and not about the compositional structure of *only have to* or *NEG + have to + Exceptive*.

3. THE SEMANTIC COMPOSITION OF THE SMC

3.1 *Ne ... que under the Microscope*

Recall that in French, the SMC looks as follows:

- (57) tu n' as qu'à aller à North End
 you not have except-to go to NE
 "You only have to go to the North End."

We propose to analyze this type of SMC as containing three elements: negation scoping over a necessity modal which in turn scopes over an "exceptive quantifier". We will see that with some work this gives an adequate compositional analysis for the SMC. After that, we will return to the *only*-type of SMC and try to argue that it as well involves three elements.

In what follows, we will sometimes use French as perhaps the most familiar kind of example, but it should be clear that we are talking about the NEG + Exceptive construction as found not just in French but also in Greek, Irish, etc. Schematically we will use NEG to stand for the element expressing negation and QUE for the exceptive element.

First, we need to put some working assumptions about NEG + QUE in place.⁹ Consider a simple non-modal example:

⁹ Dekydtspotter's SALT 3 paper [10] provides an extensive discussion of *ne ... que*. We will not adopt his proposal in any detail. See also Azoulay-Vicente [1]. Beyond French, we are not familiar with

- (58) Je n' ai vu que Jean
 I not have seen QUE Jean
 "I only saw John."

Our basic idea is that semantically the QUE-phrase introduces an existential quantifier over individuals "other than" Jean.¹⁰ There is a syntactic question here as to whether there is a covert quantifier *something/anything* which is then modified by the QUE-phrase, or whether the entire quantifier meaning is all wrapped up in the meaning of the QUE-phrase. For simplicity, we will adopt the latter answer.^{11,12} So,

detailed semantic work on the NEG + Exceptive construction in other languages.

¹⁰ Readers familiar with the existing work on exceptives in formal semantics, esp. the first author's work on this topic [11], will realize that we are not treating *que* as a bona-fide exceptive in the strict sense. The non-identity "other than" condition it expresses is very weak compared to the conditions expressed by English exceptives like *but* or *except*. To some degree the difference is actually masked in the case where the operator modifies an existential quantifier in the scope of a negation. It has always been a puzzle why exceptives can modify NPI *any* as in *I didn't see anyone but John*, see Gajewski [15] for a recent attempt at solving that puzzle. Here, we just note that if the exceptive in its NPI-like use only expresses a non-identity condition, there is no need to go to heroic measures like the ones explored by Gajewski. Having said that, there are reasons to at least modify the simple "other than" semantics, as will be discussed in Footnotes 15 and 16.

¹¹ Historically, at least, one would expect that there used to be an overt host. Jay Jasanoff (personal communication) tells us that the *que* of *ne . . . que* comes from Latin *quam* ('than') and not from *quod* (the complementizer 'that'). More specifically, the source would be the following:

- (i) non vidi alium (hominem) quam Iohannem
 not saw other (man) than I.

The innovation that would have had to have happened to yield the Modern French string is the deletion of *alium* (*hominem* was anyway optional, as the adjective could stand on its own in Latin.) Since the equivalent of *ne . . . que* occurs in Spanish, Irish, Greek and other languages, we are faced with the question of development there as well. One possibility would have been that the construction appeared in a mother language that these languages share but given their spread it would have to be proto-IE of circa 4000 BC. And if the *ne . . . que* construction did indeed go back to that time, we would expect to find it in intermediate stages, but this is not so. Latin, for example, lacks any equivalent of *ne . . . que*. This leaves as the only possibility that the development happened independently in all these languages. So possibly this was an areal feature spread from one language to another by imperfect bilinguals serving as the vehicle of transmission. – We are very grateful to Jay Jasanoff and his informants for discussing these points with us.

¹² Although we do not wish to thoroughly address the question of the syntactic presence of a covert host, one might consider the following, possibly weak argument, in favour of the position that hostless exceptives are truly hostless, namely that there isn't a covert quantificational element like "somebody other than".

In languages where there is no doubt what Case we are dealing with, based on the form of the noun, we see that the Case on the argument of (the equivalent of) *que* depends on the grammatical role the covert host would have held. In other words, the Case on the argument of *que* can be Nominative, Accusative, etc.:

we will be working with a meaning for *QUE Jean* as follows:

$$(59) \quad \llbracket \text{QUE Jean} \rrbracket = \lambda P. \exists x (x \neq \text{Jean} \ \& \ P(x) = 1).$$

We will further assume that the QUE-phrase stands in an NPI-like licensing¹³ relation to the negation NEG – to capture the fact that it is only under negation that exceptive QUE-phrases are grammatical.¹⁴ Later on we will see more arguments for the NPI-nature of QUE-phrases.

Taken together, (59) therefore means that it is not the case that there is someone other than John that I have seen, which appears to be adequate at first glance – we will soon enough have reason to refine this analysis.

Now, in the SMC, there is a necessity modal intervening between the negation and the QUE-phrase:

$$(60) \quad \text{NEG} \succ \text{necessity} \succ \text{QUE}$$

The QUE-phrase here would be an existential quantifier over verb phrase meanings “other than” going to the North End. We expect the following interpretation:

$$(61) \quad (\text{To find good cheese}), \text{ it is not necessary that you do something other than going to the North End.}$$

-
- (i) Dhen irthe para o Yanis
NEG came PARA the John/NOM
 - (ii) Dhen idha para ton Yani
NEG saw PARA the John/ACC
 - (iii) Dhen milisa para me ton Yani
NEG talked PARA P the John /PREP ACC

This differs from hosted exceptives, which always come with their own Case, e.g. *Greek* *ektos* always comes with (Prepositional) Accusative (or Genitive, depending on the dialect). Compare (iv) with (i):

- (iv) Oli i andres irthan ektos apo ton Yani
All the men/NOM came except P the John/ACC

It seems, then, that the argument of *para* has direct access to the Case assignment process that the covert quantificational element would have had if it existed. One could stipulate that the covert host is still there and that there is some sort of unusual concord going on, but it is, of course, simpler to hypothesize that the *para*-phrase itself stands in the relevant case position and there is no covert host.

¹³ See Giannakidou [18] for another use of NPI *para*.

¹⁴ The discussion about the actual French construction *ne . . . que* is complicated by the fact that a fair amount of literature has *pas* and not *ne* carry negative force. However, this assumption would have to be amended or supplemented anyway because of cases like *ne . . . personne*.

Or in other words ($\neg \Box \exists \equiv \Diamond \neg \exists$):

- (62) In some worlds where you find good cheese there is nothing you do other than going to the North End.

This sounds right.¹⁵ But we still need to consider the presuppositional part of the meaning of *only*/NEG + QUE. Consider again the simple sentence (58), repeated here:

- (58) Je n' ai vu que Jean.

With what we have so far, this sentence would mean that I saw nobody other than Jean. But (58) says more than that. The sentence reliably conveys that I saw Jean, not just that I saw nobody other than him (which might have left it open whether I saw him or not). In this, (58) behaves just like an analogous *only*-sentence:

- (63) I only saw John.

As we saw earlier, the part of the meaning of (63) that conveys that I, in fact, saw John (not just that I didn't see anybody other than him) is attributed to a presuppositional component of the meaning of *only*. We should then try to apply the same move to (58) to get this sentence to convey that I saw Jean. We will look at two options from the literature about the relevant presupposition of *only*: the Horn 1969 analysis and the Horn 1996 analysis, already touched on in Sections 2.2 and 2.3. We will apply each in turn to the NEG + QUE construction and to the SMC.

OPTION A: Strong presupposition à la Horn 1969:

- (64) Q(QUE Jean):
 A: $\exists y (y \neq \text{Jean} \ \& \ Q(y) = \mathbf{1})$
 P: $Q(\text{Jean}) = \mathbf{1}$

¹⁵ To make sure this is indeed right, we have to be clear about what it means for something to be “other than” going to the North End. First of all, it is logically impossible to go to the North End without incurring some other properties as well, such as changing position. As is familiar from the semantics of *only*, cf. e.g. von Fintel [13] for a summary, such entailed properties do not count as “other”. But beyond that, going to the North End to find good cheese may also involve entering one of the many stores there, something that is not entailed by going to the North End but would still count as “part of” going there and thus shouldn't count as “other” either. We suspect that the notion of lumping, which has proved useful in the semantics of “only”, cf. again von Fintel [13], could be appealed to here as well. We leave the obvious moves to the imagination of our experienced readers. We do continue the discussion of similar issues in Footnote 16.

Under this analysis, (58) presupposes that I saw John and asserts that I didn't see anybody other than John. This sounds right. But the question now is what happens to the presupposition in the SMC, where we have a modal to complicate matters.

To answer that question, we need to remind ourselves what happens to presuppositions under modals in general. Consider an example involving the existence presupposition triggered by a definite possessive phrase:

- (65) To attend this dinner, you don't have to bring your campaign donation (you can mail it in afterwards).

To the naïve ear, it sounds as if (65) either (i) presupposes that the addressee will give a donation anyway or (ii) presupposes that to attend the dinner, it is part of the requirements that the addressee make a donation. Most theories of presupposition will deliver one or both of those readings. A straightforward analysis in the Karttunen/Stalnaker/Heim tradition, for example, will deliver the second presupposition, but will make space for additional inferences yielding the first presupposition.

By analogy, then we would predict that the structure

- (66) NEG > necessity > QUE (go to the North End)

will either (i) presuppose that you do go to the North End (anyway) or (ii) presuppose that to achieve the goal you *have to* go to the North End.

That is not a good prediction. It is clear that the sentence can be uttered without presupposing that one goes to the North End anyway. And the second presupposition is also entirely undesirable, as we saw when we presented what we called the Prejacent Problem: we don't want to derive that going to the North End is a necessary condition, as this is clearly not what (66) conveys.

Is there wiggle room within Option A (Horn 1969)?

Perhaps, the presupposition that we go to the North End is ACCOMMODATED into the restriction of the modal, that is, it becomes part of the understood domain restriction of the modal. Incorporating a presupposition in the restrictor of an operator is a process often referred to as "local" or "intermediate" accommodation, and it is discussed in some detail in Berman [5] and Kratzer [27]. What would we get if we incorporated the presupposition that we go to the North End into the restrictor of the modal? We would get that the worlds quantified over are assumed to be just the worlds where you go to the North End, narrowing the claim. (57) would then be interpreted as follows:

- (67) In the worlds where you go to the North End, to get good cheese, you don't have to do anything other than going to the North End.

If we could incorporate the presupposition into the restrictor of the modal, deriving (67), we could have our cake and eat it too, so to speak, because the assertion would be that we don't have to do anything other than going to the North End in the worlds where we go to the North End. Our problem is that we do not feel comfortable with this process of incorporating the presupposition into the restrictor of an operator. Not just for the case of the SMC but in general.

In fact, local accommodation into a quantifier restriction has been a matter of dispute, see Beaver [2], von Stechow [12], Geurts & van der Sandt [17], among others for discussion. Here is a simple example, taken from von Stechow [12], that shows what can go wrong with incorporating presuppositions in the restrictor of an operator. Consider the following sentence:

(68) Every man loves his wife.

This sentence presupposes that we quantify over a domain in which all men are married, otherwise the sentence suffers from presupposition failure. In other words, (68) makes sense only if we can make it be about married men only. The process of local accommodation (whereby presuppositions are incorporated in the restrictor) would have (68) be equivalent to:

(69) Every man who has a wife loves his wife.

But are (68) and (69) in fact equivalent? They are not. Contrasts the following two pairs:

(70) a. Not every player on the team is married
b. #But everyone loves their spouse

(71) a. Not every player on the team is married
b. But everyone who is married loves their spouse

If (68) and (69) were equivalent, as the process of local accommodation would have it, then we would predict, contrary to fact, that there should be no difference in the discourses in (70) and (71). Since there is a clear difference, (68) and (69) are not equivalent. For reasons like these, we cannot appeal to the process of local accommodation in the SMC with a clear conscience. We would prefer to do without this mechanism. This means that we cannot appeal to Horn's 1969 presupposition of *only* to derive what we want as we would have needed local accommodation to obtain our goal. So let's try Horn 1996.

OPTION B: Weaker presupposition à la Horn 1996:

As discussed briefly in Section 2.3, in this newer proposal by Horn the presupposition of *only* p is not that the prejacent p is true but that there is some relevant alternative (not necessarily p) that is true. Transposed to NEG + QUE, this would give us:

- (72) Q(QUE Jean):
 A: $\exists y (y \neq \text{Jean} \ \& \ Q(y) = \text{I})$
 P: $\exists x (Q(x) = \text{I})$

As we noted before, in unembedded cases, this weaker presupposition makes no new predictions. The assertion together with the weaker presupposition entail that the prejacent is true:¹⁶

- (73) Je n'ai vu que Jean.
 A: I did not see anybody other than John
 P: I saw someone
 \Rightarrow I saw John

But there are significantly different predictions when there are embedding operators present. Consider what we predict for the SMC:

- (74) tu n'as qu'à aller à North End.
 A: in some of the good cheese worlds you don't do anything other than going to the North End
 P: in all of the good cheese worlds you do something

Now we have finally avoided the Prejacent Problem. We do not anymore predict that you have to go to the North End. The presupposition is the weak (and surely trivial)

¹⁶ This is not entirely true as it stands. Take a sentence like “I didn't see anybody other than John and Peter.” This together with the presupposition that I saw someone does not entail that I saw John *and* Peter – instead, it only entails that I saw John *and/or* Peter. The problem lies in the fact that we have to understand “other than” as really meaning non-overlap and not non-identity. Otherwise, “I didn't see anybody other than John and Peter” would entail that I didn't see John and that I didn't see Peter, which would obviously be absurd. But this then means that “I didn't see anybody other than John and Peter” is actually compatible with me seeing just Peter – perhaps not the best kind of prediction. We might solve this problem by adding considerations about quantity implicature to the mix. A speaker who had only seen John should say “I didn't see anybody other than John” rather than “I didn't see anybody other than John and Peter” because the former is a stronger statement than the latter. We'll live with this fix and leave it open whether implicature considerations could be used in place of presuppositions in other places in our analysis – a topic that is of course the focal point of much work on *only*.

claim that to get good cheese you have to do something. So, what we remain with is the assertion that in some worlds where you get good cheese you do something but not anything other than going to the North End, i.e. not anything that is not part of going to the North End. In other words, going to the North End is a sufficient but not necessary way of getting good cheese.

Let us spell this out one more time. We assume that a sentence like *he didn't see anyone other than John* presupposes that he saw someone and asserts that there is nobody distinct from John that he saw. Taking the presupposition and assertion together, we can infer that he saw John. Now, in the SMC we have the claim that *you don't have to do anything other than go to the North End*. This presupposes that you have to do something and asserts that it is not the case that in all of the worlds you do something other than going to the North End. From this, it cannot be inferred that in all of the worlds you go to the North End. The prejacent cannot be inferred. The reason is that we have split the scope of NEG and QUE across the universal modal.

So it seems that with accepting the presupposition of Horn 1996 for *only* and transposing it to NEG + QUE, we get exactly what we want in the SMC. But we are not done yet. We still need to talk about the languages that do the SMC with *only*. We'll get to all that soon. First we would like to alleviate a worry that the reader might have at this point.

Note that we have split the SMC into three different operators: NEG \succ necessity \succ “something other than”. We would not have derived the desired result if we had treated the NEG + QUE construction as an indivisible logical element meaning “nothing other than”. In our analysis, the negation and the existential “exceptive” are separable.¹⁷ But we also said that the relation between negation and QUE is an NPI-like licensing relation. One might think that there is a contradiction here. The NPI-licensing relation is known to be subject to intervention effects, originally captured in Linebarger's Immediate Scope Constraint [29].

Consider for example:

(75) Mary didn't wear any earrings at every party.

Reading 1: There is no particular earring Mary wore at every party. (NOT NPI every)

Reading 2: At every party Mary wore no earrings. (Every NOT NPI)

Reading 3: Not at every party were there any earrings Mary wore. (*NOT every NPI)

Note that while the relative scope of *every* and *not* + *NPI* is variable in (75), Reading

¹⁷ This is a crucial difference between our assumptions and those made by Dekydtspotter [10].

3 where the scope of negation and the NPI is split is unavailable, that is, there is no reading where a scopal element scopes in between negation and the NPI.

While Linebarger herself does not go into the question of why the Immediate Scope Constraint should hold, Guerzoni [19] argues that the Immediate Scope Constraint is an intervention effect at LF, similar to so-called Beck effects [3]. In particular, NPI-licensing is a relation that needs to be checked locally, either by QRing the NPI to its licensor or by covertly moving a feature from the NPI to its licensor. Logical operators such as the universal quantifier *every party* act as barriers for feature movement, which means that the NPI needs to QR to its licensor. This explains why in examples such as (75), negation + NPI acts as one semantic unit.

Now it should be clear that our analysis might look problematic. We crucially assume that the necessity modal in the SMC has logical scope between negation and the existential exceptive QUE-phrase. That should contradict the Immediate Scope Constraint. In response to this worry, we would like to show that modal operators do not behave as interveners for the NPI-licensing relation. Consider:

(76) You didn't have to bring anything.

Note that (76) means that it was not necessary for you to bring something. It does not mean merely that there was nothing that it was necessary for you to bring. The latter could have been true while it was also true that you had to bring something (without it mattering what in particular you brought). In other words, (76) does have the stronger meaning that results from the scoping negation \succ necessity \succ *anything*.

So, modals do not block the NPI-licensing relation and our conclusion in this section is not imperiled by concerns about the Immediate Scope Constraint.¹⁸

¹⁸ In Guerzoni's terms, this means that feature movement is possible across a modal from an NPI to its licensor, without the NPI having to scope over the modal.

It is interesting to explore for a moment whether modals serve as "Beck interveners" or not. We suspect that they don't there either. In fact, in David Pesetsky's book [33], he discusses a relevant set of examples (verbatim his (99) on p.61):

- (i) *Intervention effect with not – nonsubjects*
- a. Which issue should I not discuss ____ with which diplomat?
 - b. ??Which diplomat should I not discuss which issue with ____?
[cf. *Which diplomat should I discuss which issue with ____?*]

For Pesetsky, the crucial point here is that negation in (ib) blocks the pair-list reading for the example, because it prevents the in situ *wh*-phrase from raising at LF. He presents a minimal contrast without negation to show that the pair-list reading emerges without any problem. What is important for us is that the example without an intervention effect still contains a deontic *should*, which obviously does not induce an intervention effect, even though it is a quantificational element under standard semantic analyses.

3.2 *The “Only” Languages*

3.2.1 The Set-Up

In the previous sections we investigated the SMC in what we called the NEG + Ex-ceptive languages. Now it is time to turn to what we had called the “only”-languages, exemplified here with English:

(77) If you want good cheese you only have to go to the North End.

We all know how thrilling it is to be able to claim that two groups of languages are basically alike in areas where they look dissimilar at the surface. So let’s try to see if we can make it happen here.

Recall that in the NEG + Ex-ceptive languages we have found that the SMC contains the following scopal order of three elements:

(78) NEG \succ Modal \succ (\exists other than)

On the other hand, the *only*-languages contain only two elements: the modal and *only*. We saw in an earlier section that only the modals that scope under negation can appear in the SMC. Presuming that *only* is affective enough (in the Klima sense), this would mean that the scopal order of *only* and the modal would have to be as follows:

(79) *only* \succ modal

But still, (79) is a far cry from (78). Moreover, simply being “affective” is not enough to bring about an SMC reading, since not all affective elements can pull it off. The following lack an SMC reading, even though the modal appears in environments where NPIs are licensed:

- (80) a. Everybody who has to go to the North End
 b. You can get good cheese without having to go to the North End.

So (79), as it stands, doesn’t quite do the job. The next step would be then to look for actual negation. Specifically, we will propose that *only* should be decomposed into two elements, a Negation, and the quantificational element “ \exists other than”. Such a decomposition clearly fits the garden variety environments of *only*:

- (81) a. Only John was in the room.
 b. Presupposition: Someone was in the room.

We refrain from speculation about what the fact of the non-intervening nature of modals has to contribute to existing analyses of intervention effects.

- c. Assertion: There was nobody other than John in the room.

Decomposing *only* in this way will bring us a tad closer to assimilating the *only*-languages to the NEG + Exceptive languages, since now we will have three elements to play with. That is, instead of (79), we have (82):

$$(82) \quad (\text{Negation} + \exists \text{ other than}) \succ \text{Modal}$$

Unfortunately, we still face one of our biggest hurdles, namely the Prejacency Problem. Consider our initial SMC, repeated in (83). With the decomposition of *only* that we are contemplating, (83) would be equivalent to (84), given the scopal order in (82).

(83) ... You only have to go to the North End

(84) ... There is nothing other than [go to the North End] that you have to do

But the Prejacency Problem raises its not-so-pretty head again, since (84) entails that you have to go to the North End, a meaning component that is wrong for the SMC as we have seen, given that the SMC says that going to the North End is a sufficient, not a necessary, condition to get good cheese.

So what do we need to do? The answer is, in a way, simple: we need to make the *only*-languages look exactly like the NEG + Exceptive languages. That is, it's not enough to decompose *only* into two elements, we have to split its scope. We have to turn (79)/(82) into (85):

$$(85) \quad \text{Negation} \succ \text{Modal} \succ \exists \text{ other than}$$

This will make the *only*-languages identical to what the NEG + Exceptive languages carry on their sleeve and it will make the Prejacency Problem go away.

But is it possible to do what we propose? Can we decompose an element and split its scope? We address this question next.

3.2.2 Negative Split

Since Jacobs [24], there has been reference widely known as NEGATIVE SPLIT. The general idea is that a Negative Determiner like *no*, splits into two elements, negation and an existential quantifier, with negation always outscoping the quantifier:

$$(86) \quad \text{no} = \neg + \exists$$

The reason that there is even suspicion that *no* should be decomposed like this is that sometimes the two elements can be seen as scoping across another scopal element, which means that the scope of *no* has “split”:

(87) NEG \succ scopal element \succ \exists

The biggest part of the literature on negative split focuses on Dutch and German.¹⁹ To illustrate the phenomenon, we start by borrowing from the discussion by Rullmann [37]. Rullmann is a representative of the “lexical decomposition” approach to Negative Split.²⁰

According to Rullmann, in Dutch, there is an incorporation rule à la Klima, as in (88):

(88) *niet* (Negation) + Det_{indef} \Rightarrow *geen*

Rullmann is not explicit about the specifics of this incorporation but he says, at LF, the two elements can be separated from each other again. When the two elements go their separate ways at LF, we get Negative Split, henceforth NS. We will be glossing *geen* with English *no*, without making any claims about the splittability of English *no*.

NS can happen and result in Negation scoping over a modal element, with Det_{indef} scoping under this same modal element. Take for example, the Dutch universal modal *hoeven*, which must scope under negation, due to its NPI-like nature (for this reason we are glossing it as *need*, the closest that English has to an NPI modal). As a result, (89) cannot mean (90):

(89) Ze hoeven geen verpleegkundige te onstlaan
they need no nurse to fire

(90) It is necessary that they fire no nurse

One way to get *hoeven* under negation is the reading in (91):

19 Only limited negative splitting has been reported in English [28, 35] – see also Heim [20], although she doesn’t end up endorsing a split-based analysis. Here is an English example where the scopal element in question would be a modal:

- (i) I need no secretary (ambiguous)
- (ii) I need to have no secretary
- (iii) \neg I need [\exists (secretary) λx . PRO to have x]

If we’re right about the proper analysis of the SMC in *only* languages involving a scope split of *only*, we can add another item to the catalogue of Negative Split phenomena, one that English fully participates in.

20 See Geurts [16] and de Swart [40] for approaches based on higher-type entities, and Penka & Stechow [31] for an approach based on an abstract negation. See Penka & Zeijlstra [32] for a very recent paper, which we have not had the chance to study.

(91) For no nurse x does the following hold: it is necessary that they fire x

This is indeed a possible reading of (89) and it can be truthfully uttered in a context where it was claimed that there might be a specific nurse that has to be fired. According to reading (91), there is no such specific nurse. But by far the most salient reading of (89) is the one that asserts the following:

(92) It is not necessary that they fire a nurse.

In this reading the scopal relations are Negation \succ Modal \succ Det_{indef}. For this reading to be possible, *geen* must have undergone NS.

Another type of Negative Split example possible in Dutch and German depends on the fact that in these languages (as in English) sentential negation on the surface right of a universally quantified subject can scope over the subject (under the right conditions, see Büring [7]). Here is an example from German:

(93) Jeder Arzt ist nicht anwesend.
 every doctor is not present
 ‘Not every doctor is present.’

We can now set up examples with NS where Negation outscopes the universally quantified subject while the indefinite determiner scopes under the subject:

(94) Jeder Arzt hat kein Auto.
 every doctor has no car
 ‘Not every doctor has a car.’

We would like to remain agnostic about the actual mechanics of negative split. What is important for us is that the phenomenon exists and that another negative-like element, namely *only*, can be reasonably described as undergoing it.

3.2.3 Negative Split of *Only*

In Section 3.2.1, we proposed that the scope of *only* splits, as evidenced by the behaviour of this element in the SMC. This move also permitted us to assimilate the *only*-languages to the NEG + Exceptive languages. We suggested that this was part of a larger phenomenon, often referred to as “Negative Split”. In Section 3.2.2 we gave a short overview of some of the basic relevant data and gave an example of one basic type of approach that has been suggested. In this section we return to discussing in more detail the “splitting *only* hypothesis”.

Can we find more evidence that *only* splits in the way we suggest? One problem with finding uncontroversial evidence is that in many environments *only* and its

associate can take sentential scope with the same meaning as splitting *only* would yield. Take for example the modal element *may*, which is ambiguous between an epistemic and a deontic reading:

- (95) a. He may be home by now (epistemic)
b. He may go to the movies (deontic; permission)

On its epistemic use, *may* scopes over negation, while on its deontic use it scopes under negation:

- (96) a. He may not be home may > not
b. He may not go to the movies not > may

When we place *only* in a sentence with *may*, then if *only* did split, we would predict the following orders:

- (97) a. when *may* is epistemic: may > not > other than
b. when *may* is deontic: not > may > other than

This is indeed what we find:

- (98) a. epistemic: He may only have one arm may > Neg > other than
b. deontic: He may only have one cookie Neg > may > other than

Unfortunately, we cannot take this as uncontroversial evidence that *only* splits. The reason is that *only one* could be raising at LF. It would be able to raise above deontic *may*, yielding (99):

- (99) only one λn may (he have n -many cookies)

but it would not be able to raise above epistemic *may*, with which it could therefore create only the following:

- (100) may (only one λn he have n -many arms)

Obviously, these are the same readings as the splitting *only* hypothesis predicts and so we cannot take the existence of the readings as evidence for the splitting *only* hypothesis. One could push the splitting hypothesis by saying that in order to get the contrast in (98) without splitting *only*, we would have to postulate an additional stipulation that unsplit *only* + Det cannot scope over epistemic *may*, whereas the splitting hypothesis would just reduce that to the fact that Negation cannot scope over epistemic *may*. So the argument would boil down to the question of whether we can restrict the movement of unsplit *only* over epistemic *may* by virtue of only's "negative content at large" or whether the very existence of the restriction is the

result of *only* splitting into Negation (which independently we know can't scope over epistemic *may*) and an additional element. We do not consider this occasion appropriate to pursue either approach and we will therefore limit ourselves to the position that the facts in (98) are certainly compatible with the hypothesis that *only* splits, but do not constitute uncontroversial evidence for it.²¹

On the other hand, there appear to be some outright difficulties for the splitting *only* hypothesis. We saw earlier that elements like German *kein* and Dutch *geen* can split and take scope over a universal quantifier in the subject position:

- (101) Jeder Arzt hat kein Auto.
 every doctor has no car
 'Not every doctor has a car.'

If *only* splits, then we would expect it to split in the following cases and bring about a reading where negation scopes over the universal quantifier and *other than* scopes under it:

- (102) Iedereen heeft alleen een auto (Dutch)
 Everyone has only one car
 (103) Jeder Arzt hat nur ein Auto. (German)
 Every doctor has only one car

That is, we would expect the scopal order Negation \succ universal \succ *other than*, which means that (102)/(103) would be predicted to mean (104):²²

- (104) Not everyone has other/more than one car.

The problem is that this reading is not available. The Dutch and German sentences only have the non-split reading according to which everyone has only one car. Is this fatal for the splitting *only* hypothesis?

To answer this, we have to first go back to the NEG + Exceptive languages, where the elements making up *only* so to speak, are separate items. In both Greek and French, sentential negation can take scope over a universal quantifier in the subject:

- (105) Oli i anthropi dhen echun aftokinito
 all the people NEG have car
 'It's not the case that all people have cars' Neg \succ \forall

²¹ Of course, if there were reasons to doubt the possibility of *only* and the numeral scoping out of the sentence, then our splitting hypothesis would be a good way out.

²² Note that when *other than* compares numbers, it gets to mean the same as *more than*.

- (106) Tout le monde n' a pas une voiture
all the world has NEG a car
- (107) Tout le monde ne veut pas partir
all the world wants NEG leave
'Not everyone wants to leave.'

So in Greek and French, negation can scope over a universal quantifier in the subject when we are dealing with plain sentential negation.

However, when we are dealing with negation that is part of the Greek *dhen + para* construction or the French *ne + que* construction, negation cannot take scope over a quantifier in the subject position:

- (108) Oli I anthropi dhen echun para ena aftokinito
all the people NEG have PARA one car
'all the people have only one car' universal > NEG
- (109) Kathe kathigitis dhen echi para enan voitho
every professor NEG has PARA one assistant
'every professor has only one assistant' universal > NEG
- (110) Tout le monde n' a qu' une voiture
all the world NEG has QUE one car
'Everyone has only one car' universal > NEG
- (111) Tout le monde ne voit que des oiseaux
all the world NEG sees QUE of-the birds
'Everyone sees only birds' universal > NEG
- (112) Tout le monde ne veut que partir
all the world NEG wants QUE leave
'Everyone only wants to leave', 'Everyone wants only to leave'

If Negation could have scoped over the subject quantifier then sentence (110) for example could have had the reading 'It is not the case that everyone has more/other than one car'. And (111) could have meant 'It is not the case that everyone sees more/other than birds'. But these readings are clearly unavailable.

So here is where we are: We are proposing the splitting *only* hypothesis. But then we saw that *only* does not split in environments where negative split (or just wide scope of negation) is easily available. However, it turns out that in NEG + Exeptive languages, even though Negation can in general scope over a quantified subject, negation cannot scope over a quantified subject when it (negation) is part of the NEG + Exeptive construction. This means that the fact that *only* can't split across a quantified subject is not an argument against the splitting *only* hypothesis,

since “naturally decomposed” *only*, namely NEG + Exceptive, cannot split across a quantified subject either, even in languages where negation otherwise can scope over a quantified subject. In short, the facts are not fatal to the splitting *only* hypothesis.

Let us see what else we can learn from this picture. Why would Negation not be able to be separated from the Exceptive phrase? That is, why is (113) impossible?

(113) *NEG \succ Quantifier \succ QUE

Note that this question is the same for both the *only* and the NEG + Exceptive languages.

Actually, we have already seen the explanation for the impossibility of (113): in Section 3.1, we proposed that the reason is that the QUE-phrase is (or contains) an NPI (\exists_{NPI} *other than*) and that (113) is unacceptable because of an intervention effect (an instance of Linebarger’s Immediate Scope Constraint).

The natural extension of what we said about NEG + QUE then is that the reason that *only* does not split across a universal subject is that one of the elements that *only* splits into (namely \exists_{NPI} *other than*) is an NPI. For this reason it cannot be separated from its licensing negation by the intervening universal quantifier.

An additional argument that *only* doesn’t split across a quantified subject because of an intervention effect on NPI licensing are the following facts, which do not involve splitting. We have seen many times by now that negation can scope over a quantified subject. It turns out that this is not possible when the VP contains an NPI.

- | | | | |
|-------|----|---------------------------------------|-----------------------|
| (114) | a. | Everyone didn’t leave. | NEG \succ universal |
| | b. | ?Everyone didn’t eat anything. | universal \succ NEG |
| (115) | a. | Everyone has not been to Paris. | NEG \succ universal |
| | b. | ?Everyone has not ever been to Paris. | universal \succ NEG |

In fact, for quite a few speakers the effect is even stronger in that the b-variants are degraded sentences. This presumably means that for these speakers sentential negation really prefers to scope over the quantified subject and when this conflicts with the licensing of an NPI, the sentence becomes unacceptable.

The same facts hold in German:

- (116) Jeder Student ist nicht gekommen.
 every student is not come
 NEG \succ Universal (Universal \succ NEG also possible)
- (117) Jeder Student hat nicht mit der Wimper gezuckt.
 every student has not with the eyelash twitched.
 Universal \succ NEG

In other words, even in environments where negation can scope over a quantifier subject, a quantifier cannot separate negation from the NPI. So the reason that *only* cannot split across a universal quantifier subject is not an argument against *only* splitting but is the result of the fact that one of the elements that *only* splits into is an NPI. We saw the very same facts in NEG + Exceptive languages.²³

We are now done presenting our proposal that *only* splits in the SMC and that therefore the *only*-languages and the NEG + Exceptive languages do the same job the same way at LF. We are thus also done with solving the compositionality puzzle for both kinds of languages.

²³ We may need to remind even the careful reader that we observed in Section 3.1 that the relation between NEG and the NPI QUE-phrase is not disrupted by modals, in other words: modals do not create intervention effects for NPI-licensing including the NEG-QUE relation.

We would like to add to this now the reinforcing observation that again the two groups of languages behave alike since also in the NEG + Exceptive languages, a modal can separate Negation and the *quel/para*-phrase:

- (i) Neg \succ Modal \succ *quel/para*

In the proposal we are developing, the difference would have to mean that unlike quantifiers, modals do not cause intervention effects for NPI licensing. And lo and behind, this is indeed so:

- (ii) You do not need to bring anything to my party. NEG \succ need \succ anything
- (iii) o Yanis dhen chriazete na fai tipota
the John not needs eat anything
'John does not need to eat anything.' NEG \succ need \succ NPI
- (iv) Du brauchst nicht mit der Wimper zu zucken.
You need not with the eyelash to twitch
'You don't need to bat an eyelash.' NEG \succ need \succ NPI
- (v) Du brauchst nichts zur Party mitbringen
You need nothing to-the party with-bring
'You don't need to bring anything to the party.' NEG \succ need \succ anything
- (vi) Jeder Student hat nichts mitgebracht
every student has nothing with-brought
'Every student brought nothing.' * NEG \succ every \succ anything

Sentences (v) and (vi) show that Negation and NPI *anything* can be amalgamated into *nichts*, which can only split across a modal but not a quantifier, which is exactly what we argue to be the case in *only* as well. We cannot pursue the interesting typology of split constructions further, but would like to summarize that because of the differential intervention effects, we will have to distinguish the NPI-licensing-type splitting of *only* and *nichts* from the more liberal splitting of *kein/geen*.

4. SUFFICIENCY, EASINESS, AND MORE

After having presented our solution to the compositionality puzzle raised by the SMC, we will now address three points that arise.

4.1 *Sufficiency?*

We have called our construction the Sufficiency Modal Construction, but a careful look at our semantics for it will reveal that we do not seem to give it a sufficiency semantics, in the customary logical sense of “sufficiency”.²⁴ In logical parlance, ϕ is a sufficient condition for ψ iff whenever ϕ is true, ψ will also be true.

So, look again at our paradigm example. We say that *to get good cheese, you only have to go to the North End* means that in *some* of the worlds where you get good cheese, nothing other than you going to the North End happens. This is a far cry from saying that whenever you go to the North End, you get good cheese. In the following subsections, we will explore the fact that our semantics falls short of logical sufficiency and we will suggest that our semantics does in fact capture the meaning of the SMC correctly (and also that it is not completely misleading to call it a sufficiency construction).

4.1.1 Additional Requirements

First of all, our semantics captures the obvious fact that just going to the North End won't do for getting good cheese. You will have to enter a store, pick out some cheese, pay for it, etc. This is covered by treating those additional required actions as not “other than” going to the North End, that is, as natural part of going to the North End. We submit that it is right that our semantics does not deliver logical sufficiency here.

We would like to point out that even examples that use expressions that explicitly introduce the notion of sufficiency do not convey logical sufficiency. We find that the following variants of our sentence still do not convey that going to the North End is by itself logically sufficient for getting good cheese:

- (118) To get good cheese, it is enough to go to the North End.
- (119) To get good cheese, it suffices/it is sufficient to go to the North End.

In the end, this should not be surprising. Natural language expressions rarely correspond in their meanings to the stripped down meanings that simple logical systems

²⁴ This feature of our analysis was highlighted as a potential problem for us by Janneke Huitink. We thank her for her comments.

traffic in. Since these explicit expressions of sufficiency have the same meaning as our SMC, we conclude then that we did not misname the Sufficiency Modal Construction, even though the meaning it carries does not convey logical sufficiency.

4.1.2 Causal Conjunction

By the way, we have found that the causal conjunction variant of the SMC seems to convey something much closer to logical sufficiency. Consider the following contrasts:

- (120) If you want to learn what Morris is working on you only have to go to the Stata Center
- (121) To find out what Morris is working on you only have to go to the Stata Center
- (122) You only have to go to the Stata Center and you will find out what Morris is working on

There is a difference in meaning between (120)/(121) on the one hand and the causal conjunction in (122) on the other. In (120)/(121), you can go to the Stata Center without necessarily finding out what Morris is working on – because one would also have to do some obvious additional steps, asking someone about Morris for example. On the other hand, in the causal conjunction, going to the Stata Center will bring about the inescapable result of learning what Morris is working on. The sentence conveys that by the very fact of setting foot inside the Stata Center, you will learn what Morris is working on for example, because everybody is talking about it, or because there is a huge sign on the wall or for some other reason. That is, going to the Stata Center will immediately cause you to learn what Morris is working on.

We have to admit that we do not know precisely how the causal conjunction variant of the SMC acquires this meaning that is so much closer to logical sufficiency than the other variants. We leave this to future research on the conjunction variant.

4.1.3 That's enough

There remains a worry. Our semantics seems to fail to match the intuitive meaning of the SMC because it seems to be compatible with there being worlds where you go to the North End *and* do all the other obvious actions but still don't get good cheese. Saying that some good cheese worlds are worlds where you go to the North End (and do the obvious right things) does not entail that *all* of the worlds where you go to the North End (and do the right thing) are worlds where you get good cheese. But the latter does seem to be what the SMC conveys.

Actually, we would like to argue that our semantics does deliver the stronger meaning, against first appearances. The reason is that the worlds we are quantifying over are all supposed to be the same as far as the relevant circumstances are concerned. That is, all the relevant conditions in these worlds are the same as in the evaluation world. So, if in some of the worlds going to the North End (and doing the right thing) leads to getting good cheese, then it will do so in all of the worlds. In other words, for this kind of modality, existential and universal force collapse into the same meaning.

This predicts that one could express the meaning of the SMC with an existential teleological modal. We think that this is correct. Consider:

(123) If you want good cheese, you can (just) go to the North End.

We submit that (123) has the same meaning as our paradigm sentence.

A thorough and more formal investigation of these matters needs to await a future occasion.

4.2 *Easiness*

We saw in the beginning of the paper that one of the components of the meaning of the SMC is “easiness”. Consider our paradigm example again:

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

Roughly, (124) is uttered in order to convey that finding good cheese in Boston is easy. How is this achieved? We will argue that the easiness of the “suggested means” (going to the North End) is derived morphosyntactically and that the easiness of the “stated goal” (getting good cheese) is achieved indirectly: if p is a way of achieving q and p is easy, this means that q is easy. That is, if the means to achieve a goal are easily accessible then the goal is easily achieved. This means that if going to to the North End enables you to find good cheese and going to the North End is easy, per force getting good cheese is easy.

Both the NEG + Exceptive and *only*- constructions have “diminishing” functions outside the SMC, that is, they are associated with a scale and their focus is low on the relevant scale:

(125) He is only a soldier.

(126) Il n'est que soldat.

(127) dhen ine para stratiotis.

- (128) Níl ann ach saighdiúir
 NEG+is in-him but soldier
 ‘He is only a soldier/he is nothing but a soldier.’

So it is not surprising that items like NEG + Exceptive and *only* create an easiness implicature when they appear in the SMC, by picking an element low on a scale, let us say a scale of effort.²⁵

What are the elements on this scale of effort? Is it the stated goal as compared to other goals? Is it the suggested means as compared to other means to achieve the stated goal? Is it the suggested means as compared to other possible actions in the world (i.e. not just compared to actions that achieve the same goal)?

The semantic composition we are proposing dictates that the easiness/effort scale ranks the suggested means compared to other possible actions in the world and not compared to other actions that achieve the stated goal. In our analysis, we have the following compositional structure:

- (129) (To achieve stated goal), NEG have to do \exists P other than suggested means

The suggested means is available as early as the lowest component of the analysis, namely the “other than” component, comes in. If easiness were sensitive to the stated goal, the easiness effect would have to be associated in a mysterious way with the entire construction.

So we argue that the SMC marks the suggested action as easy per se and not just relatively easy compared to other ways of achieving the goal. To see this, consider the following example:

- (130) To get the Noble Prize, you only have to find the cure for cancer

Let us assume that finding the cure for cancer is, in fact, a way of getting the Noble Prize. Let us also assume that among the different ways there are to get the Noble Prize, finding the cure for cancer is the easiest. So, if the SMC just required the sufficient action to be *relatively* easy, (130) should be unremarkable. But it certainly feels “funny”, precisely because we all know that finding the cure for cancer is not easy at all. So, we take this to mean that the sufficient action is marked as easy per se by the construction. At the same time, we would probably not judge (130) as false

²⁵ In fact, we might suspect that it is the common “other than” ingredient that creates the easiness effect. Note that the effect seems to persist in a periphrastic version of the SMC:

- (i) If you want good cheese you don’t have to do anything other than go to the North End.

We leave for a future occasion any further exploration of how the easiness effect arises.

in the scenario we sketched. Thus, easiness is not a truth-conditional entailment of the SMC but something like an implicature.

One more argument for this position (that easiness is not just comparing the suggested action to other actions that aim for the same goal) is the following. A scale has to contain more than one item, as it provides a comparative ranking. So, constructions that rely on a non-trivial scale will “complain” if there is only one member in the scale. Thus, we find sentences like *You are my tallest son*, said to a single offspring, anomalous. Now, imagine that there is only one way to achieve a particular goal. That is, imagine for (I31) that there is no other way to enter the room and for (I32) that there is no other way to reach the island.

(I31) If you want to get into that room you only have to open that door.

(I32) To get to that island, you only have to take a half-hour ferry ride.²⁶

In the above contexts (when there is no other way to enter the room or to reach the island) these sentences are still fine. This means that the scales do not contain the one way to get to the room or the one way to get to the island – because if they did, these sentences would be funny as containing single-element scales of comparison. These sentences are fine because the scales contain opening a door and taking a short ferry ride among the many other things that one can do in the world.²⁷

²⁶ With a simple change, this example can be turned into one that makes the same point as the Nobel Prize example:

(i) To get to that island, you only have to take a three day ferry ride.

²⁷ Pranav Anand and Valentine Hacquard, independently, have urged us to consider scenarios such as the following. Imagine that we live in a town where good bread, made in artisan bakeries, is outrageously overpriced, at say \$10 per loaf. Now, in the grand scheme of things \$10 is not a large amount of money. But *for bread*, it is a lot. Consider now:

(i) To get good bread in this town, you only have to pay \$10.

It seems that (i) is funny, even though paying \$10 is not that hard in general. So, somehow the stated goal appears to be available in the rating of the suggested means, contrary to what we have been suggesting in this section. What we would like to point out is that just as (i) is funny, so is the following:

(ii) [returning from the bakery:] I only paid \$10.

We suspect that the “goal” can be pragmatically available even though it is not compositionally available (unless we resort to an ellipsis analysis and argue that the sentence is really *I only paid \$10 for the bread*).

4.3 *More Than*

The analysis we have developed in this paper is this:

(133) (To get good cheese), you NEG have to QUE go to the North End

P: In all of the worlds where you get good cheese you do something

A: In some of the worlds where you get good cheese it is not the case that you do something other than going to the North End

For a number of reasons, it might be thought that instead of using “other than” in the semantics of NEG + QUE, we could or should use “more than”. For one, we saw that the SMC seems to rate the ways of achieving the goal and zero in on the easiest, least effort involving way. For another, Spanish might be a clue to hit us in the head:

(134) No tienes más que ir al North End.
NEG have-to:2sg more than go to-the North End

Similarly, an English paraphrase with *more than* does not seem appreciably different in meaning from the SMC:

(135) (To get good cheese), you don't have to do more than go the North End.

While French *que* certainly does not correspond to “more”, it is tempting to think that it is in fact the same “than” morpheme which appears in *plus que* (“more than”).²⁸

So, should we reframe the SMC as involving “more than” in its semantics? What we would be considering is a semantics like this:

(136) (To get good cheese), you NEG have to QUE go to the North End

P: In all of the worlds where you get good cheese you do something

A: In some of the worlds where you get good cheese it is not the case that you do something *more than* going to the North End

To evaluate the proposal, we need to get clear about what it would mean for something to be “more than” going to the North End. The obvious idea is that what we are comparing are amounts of effort. Something is more than going to the North End iff it involves more effort. With that assumption in place, what does (136) amount to?

²⁸ Similar considerations might apply to Greek *para*.

Note that for now we are assuming that the presupposition of “more than” would be the same existential presupposition that we had posited for “other than”. But then the assertion is too weak to assure us that going to the North End is a way of getting good cheese. Imagine (counterfactually, thankfully) that there is no good cheese in the North End and imagine (truthfully according to Boston Magazine) that the best cheese shop in Boston is the Wholefoods Market in Cambridge. Since going to the North End involves more effort than going to the Wholefoods Market a few blocks from our house, it will be true that in some of the worlds where you get good cheese (namely the ones where you go to Wholefoods) you don’t do anything more than going to the North End, in fact you do something *less than* going to the North End. So, in this situation, the sentence (136) would be predicted to be true. That’s not good. The SMC certainly claims that going to the North End is a way of getting good cheese and should not come out true when it isn’t.

The diagnosis, in other words, is that the semantics in (136) says that going to the North End is a measure of effort that is at least as high as the easiest way of getting good cheese. It does not at all demand that going to the North End itself is a way of getting good cheese.

What could we do to fix this serious shortcoming of (136) as an analysis of the SMC? We could go back to positing a stronger presupposition, namely that “you do something more than go to the North End” presupposes that you go to the North End. Then, we could combine this with the intermediate accommodation proposal we considered before and would get the following analysis:

(137) (To get good cheese), you NEG have to QUE go to the North End

P: In all of the contextually selected worlds where you get good cheese you go to the North End

A: In some of the worlds where you go to the North End and get good cheese it is not the case that you do something *more than* going to the North End

This proposal has at least two problems: (i) it relies on the dubious mechanism of intermediate accommodation, and (ii) it is not obvious that “more than” carries such a strong presupposition. We already gave reasons for not relying on intermediate accommodation in Section 3.1. Let us therefore elaborate on the second problem.

Imagine two friends arguing about their workload during the preparations for a big event:

(138) A: Look! I did a lot of work. I got all the catering figured out.

B: OK, but I did more than figuring out the catering. I got us two very recalcitrant keynote speakers.

There does not seem to be any problem here: B is not claiming (or presupposing) that he got two speakers *in addition to* doing the catering, he's just saying that his contribution involved more effort than the catering. So, "more than" doesn't seem to come with a strong presupposition as assumed in (137).²⁹

We could therefore conclude that using "more than" as an alternative to "other than" in the semantics for the SMC is not feasible. But there is one further consideration: why does Spanish use *más que* in the SMC and why does the English paraphrase with *more than* at least *sound* like an adequate rendering of the SMC?

We suspect that in the end, it may turn out that "more than" here means exactly the same as "other than", namely that for p to be more than q it has to be the case that p is not part of q. In a part-whole hierarchy of actions one could say that "other than" and "more than" amount to the same notion.

In support, we would note that when Spanish says

- (139) No vio mas que à Juan.
 NEG saw:1sg more than PARTICLE Juan
 "I saw only John."

there is no meaning that I saw nobody heavier than John, or any other more run-of-the-mill comparative meaning. *Más que* here simply has the normal exceptive meaning and we suspect it does in the SMC as well.

5. CROSS-LINGUISTIC INVESTIGATION

In this final section, we will look in more detail at some of the cross-linguistic facts about the SMC that we have discovered in our work on this construction. Some of our explorations are as yet open-ended. We have made progress but definitive insights await further work.

5.1 *The SMC in languages without a goal-oriented possessive modal*

We have seen that the verbal element in SMC is a universal goal-oriented modal that scopes under negation. In English, SMCs are formed by *need (to)* and *have to*. In Greek by *chriazete* ('need') and *echo* ('have'). We saw above how the goal-oriented modal verb composes with the other elements to yield the SMC. In Greek (and some other languages) this is actually somewhat of a problem because the plain

²⁹ It might be possible to wriggle out of this quandary. Perhaps, "more than" has two meanings, the one in (138) where it has at most the weak presupposition that something was done and another one where it has a stronger presupposition. But we will not pursue this any further.

possessive modal lacks the goal-oriented meaning. In fact, it has a very restrictive set of readings, with the curious exception of the SMC construction.

Unlike in English, the Greek possessive modal (*echo*) does not have an epistemic reading:

- (140) *O Yanis *echi* na ine spiti tora
 the Yannis has NA is home now
 Attempted: 'John has to be home now'

Compare with *prepi* ('must'), which does have epistemic readings:

- (141) o Yanis *prepi* na ine spiti tora
 the Yannis must be home now

Echo has no goal-oriented reading:

- (142) *o yatros *echi* na eksetasi ton astheni an thelume na mathume ti
 the doctor has na examine the patient if want/1pl na learn/1pl what
echi
 has/3sg
 Attempted: 'The doctor has to examine the patient if we want to find out what he has.'

Compare with:

- (143) o yatros *prepi* na eksetasi ton astheni an thelume na mathume
 The doctor must examine the patient if we want to find
 ti *echi*
 out what he has

As for the deontic reading, it is a little bit more involved to show that Greek *echo* lacks this, given that (144) is, in fact, a grammatical Greek sentence:

- (144) *Echo* na dho ton yatro
 Have/1sg na see the doctor

What does (144) mean? We will argue that (144) has a *schedule* reading and not a deontic reading. That is, we argue that (144) means I am scheduled to see the doctor. How can we test this? For one, if the deontic source is made explicit, which would rule out the schedule reading, the sentence becomes ungrammatical:

- (145) *Simfona me tus kanonismus, o Yanis *echi* na pari adhia apo tin
 According to the rules, the John has na take permission from the

Susan kathe fora pu theli na vgi ekso
Susan every time that wants to go outside

The sentence with *prepi* is of course fine:

- (146) Simfona me tus kanonismus, o Yanis *prepi* na pari adhia apo
According to the rules, the John must na take permission from
tin Susan kathe fora pu theli na vgi ekso
the Susan every time that wants to go outside

Similarly, all the following sentences are fine with *prepi*, but not with *echo*:

- (147) *Simfona me ton nomo *echis* na katharizis to pezodhromio su
According with the law have/2sg na clean the sidewalk your
mia fora tin evdhomadha
one time the week
Attempted: 'According to the law you have to clean your sidewalk one time
per week'
- (148) **Echis* panda na kitas aristera ke dheksia prin perasis apenandi
have/2.sg always look left and right before pass across
Attempted: 'You always have to look left and right before crossing the street'
- (149) **Echo* na apofevgo to kراسي ya dhio evdhomadhesis
have/1sg avoid the wine for two weeks
Attempted: 'I have to abstain from wine for two weeks'

In short, (144) does not say that I am obligated by myself or somebody else to see the doctor but that I am scheduled to do so. Here is one more test. The English possessive modal can be used when no appointment exists and it can therefore be uttered felicitously in the following context:

- (150) I have to see the doctor about this today. I better call soon and make an appointment.

The Greek possessive modal is impossible in the same context as it already asserts that I am scheduled to see the doctor. As a result, the second sentence is infelicitous:

- (151) *Echo* na dho ton yatro simera. #Thimise mu na telefoniso
have/1sg see the doctor today. Remind me call and close
ke na kliso randevu
appointment
Attempted: 'I have to see the doctor today. Remind me to call and make an appointment'

There are languages other than Greek where the possessive modal has the schedule reading without having the deontic, epistemic or goal-oriented readings. Some such languages are Romanian, Bulgarian, Haitian, and Hindi.

Here is a table with the possible interpretations of the possessive modal in some languages:³⁰

	deontic	epistemic	goal-oriented	schedule	sufficiency
Greek	-	-	-	+	+
French	%	-	%	-	+
Italian	-	-	-	-	+
Br. Port.	+	+	+	-	+
Romanian	-	-	-	+	+
E.Spanish	+	+	+	-	+
SA. Spanish	+	+	+	-	+
Catalan	+	+	+	-	+
English	+	+	+	-	+
Icelandic	+	+	+	-	+
Bulgarian	-	-	-	+	+
Croatian	+	-	%	?	+
Finnish	+	+	+	-	+
Haitian	-	-	-	+	-
Hindi	+	-	-	-	+

In this table we see that quite a few languages are like Greek in not permitting the plain possessive modal to have a goal-oriented interpretation but still have the SMC, which we have claimed uses a goal-oriented modal.³¹

So how bad is it that the base modal does not have the interpretation that we need? Admittedly, it is not ideal. But this modal is a light verb. It would be worse if it was a lexical modal which lacked the basic meaning we needed. It would also be worse if it had been the quantificational force of the modal that changed. That is, it would be worse if plain *echo* had existential force but the *echo* in SMC had universal force. Now what we have is a light verb with the appropriate quantificational force but which does not by itself connect with the modal base that we want. Hopefully,

³⁰ We have omitted German from the table because the possessive modal is almost obsolete as a modal in German and it was hard to get reliable data.

³¹ In a way, French falls in this category as well, given that the goal-oriented readings sound archaic or marginal to speakers, yet the SMC is totally natural. The Dictionnaire de l'Académie (<http://atilf.atilf.fr/academie9.htm>) has examples of deontic readings but also these sound unnatural to speakers that we consulted. Many thanks to Fabrice Nauze for pointing us to the complexities and variation of the French paradigm.

when we understand how possessive modals obtain their modal bases we will achieve a better understanding of this particular problem also.

5.2 *What Kind of Exceptives?*

In this section, we show that in the NEG + Exceptive languages, not just any exceptive construction will be able to occur in the SMC.

Greek has at least two types of exceptive constructions *ektos* and *para*. The first obvious difference is that *para* can only³² appear in negated sentences whereas *ektos* can appear in affirmative as well as negated sentences:

- (152) Dhiavasa ta panda ektos apo afto to vivlio
I-read the everything except from this the book
'I read everything except this book'
- (153) *Dhiavasa ta panda para afto to vivlio
read the everythikng para this the book
- (154) Dhen dhiavasa tipota allo ektos apo afto to vivlio
NEG read nothing other except from this the book
'I didn't read anything other than this book'
- (155) Dhen dhiavasa tipota allo para (mono) afto to vivlio
NEG read nothing other para (only) this the book
'I didn't read anything other than this book'

In the Greek SMC it is *para* that appears. The exceptive *ektos* cannot:

- (156) dhen echis para na pas sto North End
NEG have para go to the North End
- (157) *Dhen echis ektos na pas sto North End

Why can't we use *ektos* in the SMC?

³² And not in other typical NPI-licensing environments, such as question in (i) and conditional antecedents in (ii):

- (i) *Irthan oli para mono o Yanis
came everyone para mono the Yanis
attempted: 'Did everyone come except John?'
- (ii) *An erthun oli para (mono) o Yanis ...
if come everyone para (mono) the Yannis ...
'If everyone besides John comes'

Such sentences are fine with *ektos*.

We see a similar situation in French, which has three exceptives: *sauf*, *à part* and *ne que*.

- (158) *Personne n' est venu sauf/à part Jean*
 Nobody not is come except Jean
 'Nobody came except Jean'
- (159) *Je n'ai rien mangé sauf/a part une pomme*
 I not-have nothing eaten except an apple
- (160) *Je n'ai mangé qu' une pomme*
 I not-have eaten QUE an apple

Only *ne que* can appear in the SMC:

- (161) a. *Si tu veux de bon fromage, tu n' as qu'à aller à North*
 if you want of good cheese you not have QUE-to go to NE
 End
- b. **tu n'as sauf*
 c. **tu n'as à part*

The same question arises for all the other languages that we have seen employing NEG + Exceptive in the SMC. That is, all of these languages have more than one exceptive word, yet only one of them is used in the SMC. How do they pick which one?

In addition to the NPI-status of *para* (the exceptive that appears in the Greek SMC) there is another difference between *ektos* and *para* that provides the answer to this question. And it turns out the answer is the same in all the languages that we have looked at: the exceptive *para* can appear without a host, the exceptive *ektos* cannot. The host of an exceptive is the quantifier that the exceptive operates on [11]. In (162) the emphasized item is the host:

- (162) a. *Every boy* except John left
 b. *No boy* except John left

The exceptive *ektos* requires an overt host. On the other hand, with *para*, the host can be absent:

- (163) *Dhen irthe para (mono) o Yanis sto parti*
 NEG came para (mono) o Yanis to-the party
 'Nobody came to the party except John'

- (164) *Dhen irthe ektos apo ton Yani sto parti
NEG came except from the John to-the party
- (165) Dhen irthe kanenas ektos apo ton Yani sto parti
NEG came noone except from the John to-the party

Similarly in French, the emphasized items in (158)/(159) are the hosts of the exceptives *sauf* and *a part*. The exceptive *ne que* is hostless³³ and it is only the latter that appears in the SMC.

The generalization then is the following, and again we have found no counterexamples to this generalization either:

- (166) To use an exceptive in the SMC, the language needs to have an exceptive that can go hostless.

Is this an accidental fact? In English, it appears to be possible to paraphrase the meaning we want with a hosted exceptive:

- (167) a. If you want good cheese you do not have to do anything other than go to the North End.
b. To find good cheese you do not have to do anything other than go to the North End.
c. You do not have to do anything other than go to the North End and you will find good cheese.

As is obvious from the above, these sentences require a lot more material than the NEG + Exceptive Languages we have looked at. Can we do the equivalent of (167a-c) in such languages? We saw that in French SMC can be formed with the possessive modal. However, the equivalent of (167a) is not wellformed:

- (168) *Si tu veux du bon fromage tu n'as rien d'autre à faire sauf/ à part aller à NE.

The reason may be that the French possessive modal does not by itself (that is, without the additional SMC morphosyntax) carry modality, as can be seen in the table in the previous section 5.1. As we said for Greek, we do not know why a verb can act modally in an SMC but not outside it. But whatever the reason is, it is very likely behind the unacceptability of (168).

Greek is a NEG + Exceptive language and we know that at least the verb *chriazome* ('need') can function as a teleological modal without the SMC morphosyntax.

³³ In fact, while Greek *para* can but doesn't have to go without a host, French *que* can't ever have a host. Another difference between French *ne ... que* and Greek *dhen ... para* is that French *ne ... que* cannot appear on the subject. However, if the hostless exceptives need to be in the scope of negation and if Greek but not French can have postverbal subjects, then we expect to find this difference.

So for this verb we should be able to attempt to form something like (167a), and indeed we can:

- (169) An thes kalo tiri, dhen chriazete na kanis tipota alo ektos
 If want good cheese, NEG need NA do anything other except
 apo to na pas sto NE
 from the NA go to-the NE
 ‘If you want good cheese, it is not necessary for you to do anything other
 except go to the NE’

There is no detectable difference in meaning between (169) and the SMC we have been looking at repeated below:

- (170) An thes kalo tiri, dhen chriazete para na pas sto NE
 If want good cheese, NEG need except NA go to-the NE

Sentence (170) sounds more natural but that may be simply a function of it being a lot shorter and therefore more processable. This verifies that there is nothing necessary about the exceptive being hostless for the formation of the SMC. A further question would be what else having a hostless exceptive dovetails with. Possibly it is accepting adjectives as DP heads, as in French *le grand*, *le rouge* etc., for English *the big one*, *the red one* etc. This may be relevant given the historical development alluded to in footnote 11. At any rate, we leave this for a future occasion.

5.3 *The Licensing Condition for Only in SMC*

We saw two crosslinguistic ways of forming the SMC; one is with NEG + Exceptive types of elements and one with *only*. Some languages, like Spanish can do both ways. Some languages choose one way and some the other. We have not found a language that has NEG + Exceptive but does not use it in SMC. On the other hand, we have found languages that were unable to use *only* in SMC even though they have elements that would translate as *only*. The languages in the following table all have *only* but as can be seen, they do not all use it in the SMC.

	<i>only</i> in SMC
Greek	-
French	-
Italian	+/-
Romanian	-
E.Spanish	+
SA. Spanish	+
English	+
German	+
Hindi	+
Finnish	+

Why would a language be unable to form SMC with its *only*? Things get even more mysterious because in at least Greek, *only* cannot form an SMC with the possessive modal but can do so with the equivalent of *need*. One might observe that the languages where *only* fails to participate in an SMC are a superset of the languages that do not have the possessive modal with a goal-oriented interpretation. However, since the relationship it is not a biconditional, it is unclear what the relationship actually is between have a goal-oriented possessive modal and being able to use *only* in the SMC.

There is a further complication that appears when SMC is constructed in a relative. Greek, as we said above, cannot form an SMC with the possessive modal and *only*:

(171) *...echis mono na pas sto North End
 ...have-2sg only NA go to the North End

However, in a DP, this attempt succeeds without problem:

(172) ...to mono (pragma) pu echis na kanis ine na pas sto North End
 ...the only (thing) that have-2sg NA do is NA go to the NE
 '... the only thing you have to do is go to the North End'

Since we cannot explore the SMC in a DP in the current context, we will have to leave also the contrast between (171) and (172) as a mystery for now.

5.4 Causal Conjunction

We studied the SMC without going into detail into the environments in which it can be observed. Apart from what we used as our paradigm structure, the purpose clause version, we also mentioned the anankastic conditional version and the causal

conjunction version. The latter played a crucial role in Section 4 where we used it to show that the purpose version does not really carry a meaning of sufficiency while the causal conjunction version does. In this section we would like to add some further observations about causal conjunction.

The causal conjunction variant of the SMC also exists in the NEG + Exceptive languages:

- (173) Dhen echis/chriazete para na pas sto Notrh End ke tha vris kalo
 NEG have/need-2sg na except go to the North End and will find
 tiri
 good cheese

We have found some important differences between the causal conjunction and the other two SMC environments, in addition to the difference in “sufficiency”.

Difference #2. The anankastic conditional and the construction in combination with a purpose clause are constructions that contain grammaticalizations of a stated goal. This is not the case in the causal conjunction, which merely states a cause-effect relation and can be uttered when there is not clearly a desideratum.

- (174) You only need to look at Fred and he shies away in fear.
 (175) The sky only has to darken a little bit and my dog runs under the table.
 (176) She only has to look at another man and Bill will divorce her.
 (177) This building is so precariously constructed that there only has to be the smallest earthquake and it will collapse.

The above sentences do not convey that the speaker wants Fred to shy away in fear or my dog to run under the table or Bill to divorce his wife or the building to collapse. These sentences merely convey the effect of the cause. Not so with the following:

- (178) To get Fred to shy away in fear you only have to look at him.
 (179) If you want him to shy away in fear you only have to look at him.

And sentences like (180) and (181) are decidedly odd, as they require accommodating that the weather is an agent or that the weather can be under somebody’s control, whereas absolutely no such accommodation was needed in the causal conjunction version in (175).

- (180) To get my dog to run under the table the sky only has to darken a little bit.
 (181) If you want my dog to run under the table, the sky only has to darken a little bit.

In other words the causal conjunction does not contain a goal-oriented modal but it is a causative construction. The SMC morphosyntax in the first conjunct contributes that the first conjunct is low on a relevant scale.

This observation leads to our admission that we do not yet know how to treat causal conjunction compositionally. Roughly speaking, the construction expresses that a stated effect will immediately be caused by the stated cause and that the stated cause is an event low on a scale of significance/expectedness or the like. We now see that goal-orientation is brought into the other two versions of the SMC via the presence of a purpose clause or the desire embedded in the anankastic antecedent. The modal itself carries more of an effect-orientation rather than a goal-orientation. This may help to explain the possibility of the SMC with modals that otherwise do not occur with goal-oriented meanings. But we don't know how to carry this out. Neither do we understand how the causal conjunction works in detail, because it seems to have a curiously inverted order: the restriction of the modal comes in the second conjunct. We leave these issues in this open and mysterious state for now.

Difference #3. Another, but possibly related, peculiarity of the causal conjunction is that it does not permit the plain goal-oriented modal. In anankastic conditionals and in construction with purpose clauses, the plain goal-oriented modal is fine, on the other hand:³⁴

- (182) If you want good cheese you have to go to the North End.
- (183) To find good cheese you have to go to the North End.
- (184) *You have to go to the North End and you will find good cheese.

* * *

We would like to show now that causal conjunction is related to what Culicover & Jackendoff [9] call “Left Subordinating Conjunction” (${}_{LS}and$) in distinction to ordinary coordinating conjunction (and_C). A paradigm example would be:

- (185) You move another foot and I will shoot you.

In essence, they suggest that in the cases they discuss, the first conjunct is interpreted as a subordinating *if*-clause, leading them to treat these cases as syntax/semantics-

³⁴ Jon Gajewski (p.c.) observes that in a disjunction with negation the plain practical necessity modal becomes good and the SMC becomes bad:

- (i) You have to go to the North End or you won't find good cheese.
- (ii) *You only have to go to the North End or you won't find good cheese.

mismatches that necessitate a rethinking of the interpretive architecture of the grammar.

We can show that our causal conjunction behaves in many ways exactly the same way as Culicover & Jackendoff's $\text{L}_{\text{S}}\text{and}$. We will only showcase a subset of the relevant properties, leaving a fuller exploration for some other occasion.

Backward Anaphor Binding. $\text{L}_{\text{S}}\text{and}$ permits an anaphor in the first conjunct bound to an “antecedent” in the second conjunct where and_{C} does not. The sufficiency causal conjunction patterns with $\text{L}_{\text{S}}\text{and}$:

- (186) Another picture of himself (appears) in the paper $\text{L}_{\text{S}}\text{and}$ Susan thinks that John will definitely go out and get a lawyer.
- (187) *Another picture of himself has appeared in the paper and_{C} Susan thinks that John will definitely go out and get a lawyer.
- (188) There only has/needs to be one more picture of himself in the paper and Susan thinks that John will definitely go out and get a lawyer.

Backward Quantifier-Variable Binding. $\text{L}_{\text{S}}\text{and}$ permits a pronoun in the first conjunct to covary with a quantifier in the second conjunct but and_{C} does not. The sufficiency causal conjunction patterns with $\text{L}_{\text{S}}\text{and}$.

- (189) You give him enough opportunity $\text{L}_{\text{S}}\text{and}$ every senator, no matter how honest, will succumb to corruption.
- (190) *We gave him enough opportunity and_{C} every senator, no matter how honest, succumbed to corruption.
- (191) You only have/need to give him \$5000 and every senator, no matter how honest, will succumb to corruption.

As we mentioned, the main conclusion that Culicover & Jackendoff draw is that of the existence of syntax-semantics mismatches. They argue that $\text{L}_{\text{S}}\text{and}$ is syntactically a coordination yet that there is a level (Conceptual Structure) where the first conjunct is semantically subordinated. It is crucial for them that this level is not LF. They come to this conclusion mainly from the binding facts. They actually don't claim to know how the anaphor binding tests work but for the quantifier binding tests they claim that it cannot be a level of syntactic representation like LF because syntactically the two conjuncts are coordinated. At Conceptual Structure, Culicover & Jackendoff argue that the first conjunct will be semantically subordinated to the second one. The grounds of this claim appear to be that $\text{L}_{\text{S}}\text{and}$ -coordinations are paraphrasable as conditionals, with the first conjunct being the *if*-clause. They give no semantics for conditionals and therefore no basis for accepting the claim that semantically, an *if*-clause is subordinated or even what that would mean exactly. As

far as we can tell, it is the fact that the *if*-clause is subordinated syntactically and that the first conjunct of $\text{L}_{\text{S}}\text{and}$ is paraphraseable as the *if*-clause, that makes them say that the first conjunct of $\text{L}_{\text{S}}\text{and}$ is semantically subordinated.

At any rate, let us accept that the sufficiency causal conjunction is a case of the more general phenomenon of $\text{L}_{\text{S}}\text{and}$, namely coordination that has a conditional paraphrase (leaving aside the issue of the existence of syntax/semantic mismatches). What we have been calling sufficiency causal conjunction can indeed be seen as having a conditional paraphrase. For Culicover & Jackendoff, it is crucial that the Tense/Aspect contents of the two conjuncts are exactly what they would be in a conditional. However, unlike in Culicover & Jackendoff's cases with the SMC in the causal conjunction some elements "disappear" in the paraphrase. For one, the modal elements *have to* and *need* disappear. Similarly with the diminishing *only* and exceptives. And in the paraphrase, something gets added, or at least appears instead of the diminisher that appeared in the conjunction (*only* or the exceptive).

- (192) You only have/need to look at him and he shies away with fear
 ≠ *If you only have/need to look at him, he shies away with fear.
- (193) a. If you do as little as look at him, he shies away with fear.
 b. If you as much as look at him he shies away with fear.
- (194) a. You only have/need to caress this button and the world will blow up.
 b. If you as much as caress this button the world will blow up.

So we don't just have the mystery of obtaining a conditional paraphrase, we also need to find what happens to the missing elements and what their contribution is in the sufficiency causal conjunction. And of course we need to find out why the plain goal-oriented modal cannot appear in a conjunction, as in (184).

We conclude from this that (i) the SMC causal conjunction should be treated as a subcase of Left Subordinating Conjunction, but that (ii) this would necessitate moving beyond Culicover & Jackendoff's simple late restructuring at Conceptual Structure. So, we anticipate that further work on the SMC causal conjunction will help make progress on Culicover & Jackendoff's account.³⁵ But again, this will

³⁵ We should note that not all kinds of conditionals have a conjunction variant. For example epistemic conditionals don't:

- (i) a. If he left yesterday he must have arrived already.
 b. ≠ He left yesterday and he must have arrived already.

We have the suspicion that the conditional conjunction cases are all "causal" in nature. Here are some examples that show that when causality is absent, the conditional and conjunction are not paraphrases:

- (ii) a. If a dog has blue eyes it is intelligent.

have to await a future occasion.

5.5 *More on Splitting Only*

In our proposal *only* splits and its two components scope across the practical necessity modal:

(195) *only* have to \equiv not have to anything other than

We showed that in the absence of a split, we would run into the Prejacent Problem, namely that our paradigm sentence would mean that to get good cheese you have to go to the North End and that there is nothing else that you have to do. But of course, we did not want such a reading, since our sentence doesn't require you to go to the North End, it just suggests that it is an easy (not a necessary) way of achieving the goal.

Now, we would like to draw attention to the fact that the sentence *only* has the SMC meaning that we derived via splitting *only*. It cannot be read as requiring that you go to the North End to achieve your goal. In other words, splitting *only* occurs obligatorily here. We don't know why this should be so.

The mystery deepens once we realize that not just is splitting *only* obligatory with a practical necessity modal, but splitting *only* is impossible with a deontic modal. Consider the following scenario:

(196) According to the new department policy, every faculty member has to have a cleaning up task. But there is always some choice in the matter. Michael has to clean the espresso machine or empty the trash basket. Norvin has to erase the blackboards or refill the M& M machine. etc.

b. \neq A dog has blue eyes and it is intelligent.

(iii) a. If he a man buys a horse he pays cash for it. b. \neq A man buys a horse and he pays cash for it.

One might object that (iii) does not work because unselective binding does not work in conjunctions. But this is not true:

(iv) She looks at a man and he falls in love with her.

What separates (iv) from (ii),(iii) is that in (iv) the relationship is causal.

Of course, it is possible to look at the pairs in (ii) and (iv) as paraphrases after all, but one can do that only if one imposes a causal relationship between the two conjuncts. For example, only if a dog's having blue eyes causes it to be intelligent.

In the above context evaluate the following sentence as an accurate report of what Michael's duties are:

(197) Michael only has to empty the trash basket.

If *only* does not split, the reading of (197) would be that emptying is the only obligation that Michael has. If *only* does split, the reading of (197) would be that Michael does not have to do anything other/more than empty the trash basket.

Under the unsplit reading the sentence would come out as false in the environment described. On the other hand, with the split reading, (197) would be true. It seems to us that (197) is, in fact, false, in the context described, because it falsely claims that Michael does not have a choice of what to do. And this means that *only* cannot split across a deontic modal. Unfortunately, we don't know why this would be either.

We should point out that it is important to evaluate (197) as a report of the situation and that the modal should be kept as much as possible deontic and not goal-oriented. This is admittedly quite difficult as the closeness of the following pair shows:

(198) According to the law, he has to sweep his side-walk twice a week (deontic).

(199) He has to sweep his side-walk twice a week to satisfy the law (goal-oriented).

So the line between the two modals seems quite thin in places. Of course you can have practical necessity modals that are clearly not deontic:

(200) You have to examine the patient to find out what he has.

(201) You have to cook for her to make her fall in love with you.

On the other hand, it is difficult to find a deontic modal which cannot easily be transformed into a goal-oriented modal as in the pair (198)/(199) above.

So with this in mind, the following is true in the above scenario:

(202) To satisfy the new departmental policy, Michael only has to empty the trash basket.

But unlike (197), (202) does not attempt to provide an accurate report of the situation and of the tasks that Michael has to choose from. It says that Michael doesn't have to do anything other than (only has split) empty the trash basket to satisfy the new regulation and this is definitely true.

We will not pursue the issues further in this context. Hopefully future research will reveal more about the nature of the different modal interpretations.

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