

ANATOMY OF A MODAL*

Kai von Stechow & Sabine Iatridou (MIT)

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INTRODUCTION

A new species:

- (1) To get good Gorgonzola, you only have to go to the North End.

Approximate meaning:

- Going to the North End is a way of getting good Gorgonzola.
- Going to the North End is (relatively) easy.
- Once you are there it is (relatively) trivial to get good Gorgonzola.
- It is left open whether there are other places to get good Gorgonzola.

Nomenclature: we propose the name “sufficiency modal” (SM) for this construction.

THE PLAN FOR THIS TALK

1. Variants of SM in English and cross-linguistically
2. The Compositionality Puzzle
3. Hablamos español!
4. *only* and Scope-Splitting
5. Remaining and Further Puzzles

* The authors appear in alphabetic order. We thank the participants in our Spring 2004 seminar at MIT. We thank our many patient informants who we bothered with examples until their brains hurt.

I. VARIATIONS

The ingredients of the construction:

- A necessity modal
- *only* (or *just*, *merely*, *etc.*)

Three frames:

1. purpose *to*-clause

(2) To get good Gorgonzola, you only have to go to the North End.

2. anankastic conditional (cf. Sæbø [25], von Stechow & Iatridou [13], von Stechow et al. [26])

(3) If you want to get good Gorgonzola, you only have to go to the North End.

3. conjunction of result

(4) You only have to go to the North End and you'll get good Gorgonzola.

(5) She only has to smile at him and he gets all nervous.

- (6)
- a. To get good ice cream, you only have to go to the Star Market around the corner.¹
 - b. You only have to go to the Star Market around the corner and you'll get good ice cream.
 - c. (Just) go to the Star Market around the corner and you'll get good ice cream.

The necessity modal has to be one that scopes under negation:

- (7)
- a. To get good Gorgonzola, you only $\left\{ \begin{array}{l} \text{have to} \\ \text{need to} \end{array} \right\}$ go to the North End.
 - b. #To get good Gorgonzola, you only $\left\{ \begin{array}{l} \text{must} \\ \text{ought to} \\ \text{should} \end{array} \right\}$ go to the North End.

¹ Thanks to Tamina Stephenson for the ice cream examples.

- (8) a. You must not do that. = It is necessary that you do not do that.
 b. Du mußt das nicht machen.
 You must that not do
 “You don’t have to do that.”
- (9) Du mußt nur ins North End gehen.
 You must only in-the North End go

also: NPI-modals (cf. van der Wouden [28])

- (10) Du brauchst nur ins North End gehen.
 you need only in-the North End go

A significant number of languages do not use *only* in SM but a split construction of negation and an “exceptive” marker:

- (11) dhen echis para na pas sto North End
 NEG have:2sg but NA go to-the North End
- (12) tu n’ as qu’ aller a North End
 you NEG have but go to North End
- (13) no tienes más que ir al North End
 NEG have:2sg more that go to-the North End

The Case of the Missing Modal:

- (14) Echo na dho ton yatro
 have:1sg NA see the doctor
 ‘I am scheduled to see the doctor.’
- (15) *Echo na apofevgo to krasi ya dhio evdhomadhes
 have:1sg NA avoid the wine for two weeks
 Attempted: ‘I have to abstain from wine for two weeks.’
- (16) *J’ai (que) aller a North End.

2. THE COMPOSITIONALITY PUZZLE

2.1 *have to*

- (17) To get to Harlem, you have to take the A train.

- (18) $\forall w' : w'$ is circumstantially accessible from w and you get to Harlem in w'
 \rightarrow you take the A train in w' .

[This is simplified. For more on the proper analysis of teleological modals, see Sæbø [25], von Stechow et al. [26] and von Fintel & Iatridou [13].]

- (19) w' is CIRCUMSTANTIALLY ACCESSIBLE from w if all the relevant circumstances are the same in w' as in w . Here, relevant circumstances might include the geography of New York, the layout of the public transportation system, etc.
- (20) Taking the A train is a necessary condition for getting to Harlem. There is no other way there.

Other teleological modals have weaker force:

- (21) To get to Harlem, you $\left\{ \begin{array}{l} \text{ought to} \\ \text{should} \end{array} \right\}$ take the A train.

See von Fintel & Iatridou [13] for discussion.

2.2 *only*

- (22) [Only John] was in the room.
- (23) Horn 1969 [18]:
 a. asserts: nobody other than John was in the room
 b. presupposes: John was in the room
- (24) Not only John was in the room.
- (25) John only watched “The Sopranos” on Sunday. (The philistine did not watch the UConn vs. Minnesota game!)

Rooth [23]:

- *only* is a cross-categorial operator.
- The base case is *only* combining with a sentence.
- (26) $\text{only}_C(p)$
 C = set of alternative propositions
 p = the PREJACENT proposition

- Horn-style semantics:
 - a. asserts: no $r \in C$ *other than* p is true
 - b. presupposes: p is true
- The value of C is determined (partly) by the focus structure of the prejacent.

More on “other than”:

(27) John only saw Paul and Peter last night.

(28) John saw Paul and Peter. *entails*
John saw Paul.

(29) $\text{only}_C(p)$

- a. asserts: no $r \in C$ not entailed by p is true
- b. presupposes: p is true

Further references on *only*: Atlas [1], Beaver [3], Beaver & Clark [4, 5], Bonomi & Casalegno [7], von Fintel [11, 12], and references therein.

2.3 *only* + *have to* \neq *only have to*

(30) (=1) To get good Gorgonzola, you only have to go to the North End.

Calculation:

- The value of C , partly determined by focus: {that you have to go to the North End, that you have to go to New York City, that you have to go to San Francisco, that you have to go to Florence, that you have to go to Rome, that you have to go to Reykjavik, that you have to go Zimbabwe, that you have to go to (the North End or Florence), that you have to go to (San Francisco or Reykjavik), ... }
- Assertion: There is no true proposition r in C not entailed by p (= that you have to go to the North End). You don't have to go to New York City, you don't have to go to San Francisco etc. [GOOD]
- Presupposition: you have to go to the North End, or: in all of the good Gorgonzola worlds you go to the North End. [BAD]

Wrong!

It is false that you *have to* go to the North End to get good cheese. (The Prejacent Problem)

- (31) To get good Gorgonzola, you only have to go to the North End.
 \nRightarrow To get good Gorgonzola, you have to go to the North End.
- (32) You can get good Gorgonzola in the North End, in New York City, in San Francisco, in Florence, in Rome, in Naples, . . .

What can we play with?

- The nature of the underlying modal (e.g. maybe it is not a necessity modal after all)
- The semantics of *only* (e.g. maybe we are dealing with a special reading of *only*)
- The logical structure of the construction (e.g. maybe the relative scope of *only* and the modal is not the surface scope)

3. HABLAMOS ESPAÑOL!

- (33) . . . no tienes más que ir al North End
 . . . not have more than go to-the North End
- (34) NEG have-to [you (more than go to the North End)]²

Q: How can a *more than* . . .-clause fill a VP slot?

- (35) He more than made up for his mistake. (see appendix for more examples)
- (36) *más que ir al North End*
 something more than going to the North End
 there is a predicate P which is more than going to the North End s.t. . . .
 \rightarrow a quantifier over predicates
 $\lambda Q. \exists P : P$ is more than going to the North End and $Q(P) = 1$.

Q: Is there a covert *something/anything*? Or is this all wrapped up in the meaning of *more* here?

Q: What does it mean for P to be “more than” going to the North End? First attempt: P involves more effort than going to the North End.

The *more than*-quantifier over predicates will need to move to become interpretable.

² Without argument, we will assume here that the modal *have to* is a raising predicate, see Bhatt [6] and Wurmbrand [29]. For semantic purposes, we assume that the subject has reconstructed to its source position.

- (37) In not all good Gorgonzola worlds do you do some P more than going to the North End. [NEG > have-to > ∃]

→ (in other words:) in some good Gorgonzola worlds you do no more than going to the North End

→ correctly captures that no more effort than going to the North End is required for getting good Gorgonzola

Note: The truth-conditions we derive so far are compatible with a situation where you cannot get good Gorgonzola in the North End but have to go to Medford or San Francisco, where going to Medford is at least as easy as going to the North End.

3.1 Sufficiency

Q: How can we derive that there are worlds where you go to the North End and get good Gorgonzola without further ado?

We seem to have gotten rid of the prejacent too successfully.

Two readings of *more*³:

- (38) I need more milk.

Scenario 1 There is a glass of milk in front of me. It is not as full as I had wanted. I need *additional milk*.

Scenario 2 There is a glass of milk in front of *you*. I need *more milk than you have*.

- (39) a. That's unfair. He got more milk and I didn't.
b. That's unfair. He got more milk than I did.
- (40) a. no tienes más que ir al North End
b. In not all good Gorgonzola worlds do you do some P *in addition to* going to the North End.

Idea: distinguish presupposition and assertion.

$$(41) \quad \llbracket \text{más que} \rrbracket = \lambda R_{\langle s, et \rangle} \cdot \lambda Q_{\langle \langle s, et \rangle, t \rangle} : Q(R) = \mathbf{I}. \exists P_{\langle s, et \rangle} : Q(P) = \mathbf{I} \ \& \ Q(R) = \mathbf{I}.$$

$$(42) \quad \lambda w. \text{not}(\text{have to}_w(\lambda w' : \text{you go to the North End in } w'). \\ \exists P_{\langle s, et \rangle} : P(w')(you) = \mathbf{I} \ \& \ \text{you go to the North End in } w')).$$

³ Thanks to Scott Fults, pc. This topic is rumored to be treated in uncirculated notes by Martin Hackl.

The complement to *have to* presupposes that you go to the North End.

The presupposition is locally accommodated. We would get that the worlds quantified over are all worlds where you go to the North End.

- (43) To get good Gorgonzola, you don't have to do anything in addition to going to the North End, if you do that.

I have in the past been skeptical about the possibility of intermediate accommodation into a quantifier restriction. But here we seem to need it. See Beaver [2], von Stechow [10], Geurts & van der Sandt [15], among others for discussion.

- (44) You can just dust this off and you don't have to wash it as well. (You could take it to the cleaners as well, of course.)⁴

3.2 *Easy*

Q: We do not immediately derive that going to the North End is easy. How can we get that meaning ingredient?

We can stipulate it:

- (45) $\llbracket \text{más que} \rrbracket =$
 $\lambda R_{\langle s,et \rangle} : R \text{ is easy. } \lambda Q_{\langle \langle s,et \rangle, t \rangle} : Q(R) = 1. \exists P_{\langle s,et \rangle} : Q(P) = 1 \ \& \ Q(R) = 1.$

In the end, a deeper explanation would be desirable.

3.3 *We all speak Spanish, Part 1*

Conjecture: Greek and French “exceptives” have as one of their readings a *more than*-reading.

Perhaps, they aren't really exceptives, that is true exceptive operators on quantifiers.

To be a board-certified exceptive, you should occur in these positions: *every student EXCEPT John*, *no student EXCEPT John*, and you should not be able to occur in these positions: *four students EXCEPT John*, *several students EXCEPT John*. cf. von Stechow [9].

⁴ Thanks to Irene Heim for this example.

4. *Only* AND SCOPE-SPLITTING

Now, what about languages that use *only* in the SM construction?

4.1 Step 1: *only* = *nothing in addition to*

(46) $\text{only} = \lambda R_X : R \text{ is "easy"}. \lambda Q_{(X,t)} : Q(R) = \text{I}. \neg \exists P_X : Q(P) = \text{I} \ \& \ Q(R) = \text{I}.$

(47) *only* John λQ . Q was in the room
presupposes that John is “easy” and that John was in the room
asserts that nobody was in the room in addition to John.

Applied to SM, this still runs into the Prejacent Problem.

4.2 Step 2: *Scope Splitting, or We all speak Spanish, Part 2*

The idea: scope splitting of negation from *in addition to*-quantifier.

(48) You *only* have to go to the North End
= not have-to you more than go to the North End

Scope-splitting elsewhere: *no* = $\neg + \exists$ and \neg takes scope higher up.

English has only limited scope-splitting with negative quantifiers, but see Larson et al. [20] and Potts [22].

(49) I need no secretary.

(50) \neg I need [\exists (secretary) λx . PRO to have x].

(51) The company need fire no employees. (Potts [22])

Potts also gives this example, which comes very close to the kind we are dealing with:

(52) “Anyone who doubts that need only get to know them.”
– Tom Wolfe. “Stalking the billion footed beast”. *The Best American Essays 1990*, p. 287.

In other languages, this is a more widespread phenomenon, see among others Rullmann [24], Kratzer [19], Geurts [14], de Swart [27], Penka & von Stechow [21], Heim [16].

Even when we try to enforce syntactic scope of *only* over the modal, we do not get an SM reading with *must* etc.

Sketch of an explanation:

- To get SM, we need to first get *only* back into the structure below the modal. ==> raising analysis of relative clauses (Sauerland, Bhatt, etc.)
- Then, negation needs to yo-yo back up over the modal, which is not possible across *must* etc.

5. REMAINING AND FURTHER ISSUES

- Is there a better way? We invite others to try to crack the compositionality puzzle.
- What determines whether a language uses its *only* in the SM construction?
- Why does Greek not have teleological readings of *have to* outside the SM construction?
- The other variants:
 1. Anankastic version
 2. Conjunction of Result

APPENDIX

A Chinese Example

- (63) [Lǎo Wáng zhǐ-yào qù dàshǐguǎn] jiù néng shēngǐng qiǎnzhèng.
 Old Wang only-must go embassy JOU can apply.for visa
 '[Old Wang only has to go to the embassy] to be able to apply for a visa.'

Hole [17]: “What is not clear to me is how the prefixing of *zhǐ*-‘only’ before the modal of necessity annuls the special requirement found with the necessity modals . . . , viz. that nothing else will do.”

Googled Examples of more than-VPs

- (64) a. I guess what he lacks in competence he more than makes up in persistence.

- b. What Faulk lacks in size (5-10, 211), he more than makes up in quickness and versatility. He's every bit as dangerous as a receiver as he is as a runner.
- c. He more than holds his own amongst his canine costars.
- d. During Tom's years at Anna High School, he more than doubled the student enrollment and established a Young Farmer program.
- e. Whatever harassment he gets from the Left he more than deserves.
- f. The guy is absolutely brilliant. He more than brought that tune to life.
- g. While he more than fulfilled our needs for a chief of thoracic surgery (and very promptly), Dwight Harken's main interests continued to be in the development . . .
- h. While there were naysayers who weren't sure that the intense actor could pull off working in a weekly comedy series, he more than proved them wrong, . . .
- i. It may, and often does, take longer to travel by train, but what he loses in speedy arrivals he more than gains in time to read, write, sightsee, converse, and ...

Some Entries from the OED

only, adv. 4. Idiomatic uses. a. The sense 'no more than' often passes into 'as much as'; = JUST adv. 5c. (Cf. Ger. *nur*.)

1838 MRS. STOWE in *Life* (1889) 90 Only think how long it is since I have written to you! 1849 MACAULAY *Hist. Eng.* ix. II. 410 [They] would willingly join to effect it, if only they could obtain the help of such a force..as might secure those who should rise in arms. 1875 JOWETT *Plato* (ed. 2) III. 193 He is coming..if you will only wait. 1888 *Sunday Talk* June 345/1 If I could only give you one-half of the stories..I would make the best article I have yet written.

just, adv. 5. No more than; only, merely; barely. Often preceded by *but* or *only*. c. Used to extenuate the action expressed by a verb, and so to represent it as a small thing.

1815 SCOTT *Wav.* lxiii, As it's near the darkening, sir, wad ye just step in by to our house? 1826 DISRAELI *Viv. Grey* II. xvi, I will just walk on till I am beneath her window. 1862 G. MACDONALD *D. Elginbrod* vii. 129 Just tell my maid to bring me an old pair of gloves. 1884 F. M. CRAWFORD *Rom. Singer* I. 4 Just imagine whether you are not quite as able to feed him as Gigi is. 1898 F. MONTGOMERY *Tony* 13 Mother! do just get in with me for a few minutes till the train starts.

more, a. II. Additional. Now freq. preceded by a quantifier, as *any, many, no, some*, or a number. N.E.D. (1908) labels these uses "Now rare exc. as preceded by an indefinite or numeral adj. . . and in archaic phrases", but this judgement does not appear to be borne out by contemporary evidence.

4. a. With a plural noun: additional to the number specified or implied; an additional number of; further. This use is rarely attested before the late 16th cent.; until then *mo* was more usual (see MO a.1 5a).

1586 B. YOUNG tr. S. Guazzo *Ciuile Conuersat.* IV. 193b, He..without anie more wordes unballanced the ship. a1616 SHAKESPEARE *Hen.* V (1623) I. ii. 306 Let..all things [be] thought vpon, That may with reasonable swiftnesse adde More Feathers to our Wings. 1672 C. MANNERS in 12th Rep. Royal Comm. Hist. MSS (1890) App. V. 25 Wee have every day newes of more townes taken by the French in Holland. 1719 D. DEFOE *Life Robinson Crusoe* 167, I had run so much Hazard., nor had I any Mind to run any more Ventures. 1799 DUKE OF WELLINGTON *Dispatches* I. 22 More troops being sent to their aid, a general action took place. 1869 *Pall Mall Gaz.* 15 Nov. 3 More grapes were now thrown in, and again the treaders set to work. 1926 C. VAN VECHTEN *Nigger Heaven* 252, I said, Now, daddy, do you know any more tricks? 2000 *Sci. Amer.* Mar. 16/1 Pedestrian-friendly neighborhoods rather than more subdivisions, more mini-malls, more parking lots and more traffic.

b. With a singular noun: additional to the quantity specified or implied; an additional amount of; further.

c1300 (?c1225) *King Horn* (Cambr.) 834 Ischal al one Wiute more ymone..Bring hem re to dee. c1330 (?c1300) *Bevis of Hampton* (Auch.) 3541 Wi at and wi mor catel He made e castel of Arondel. c1380 *Sir Firumbras* 1495 e lordes bu an a-paste wy-oute more a-do. ?a1425 (c1400) *Mandeville's Trav.* (Titus) 209 Withouten ony more rehercyng..of maruaylles. c1450 (?a1400) *Wars Alexander* (Ashm.) 118 His land suld be lost withouten lett mare. c1500 (c1400) *Sir Cleges* (Ashm.) 225 It is tokenyng Off mour godnes at is comyng; We shall haue mour plente. 1511-2 *Act 3 Hen.* VIII c. 6.1 Without eny more oyle. 1570 in J. Cranstoun *Satirical Poems Reformation* (1891) I. x. 185 Quha stickit him, withouttin proces moir. 1589-1600 *Acct. Bk. W. Morton* f. 63, For vii stane half of small takell to be wellding and mar tekell at xlvi s. the stane. 1653 I. WALTON *Compl. Angler* iii. 82 Come Hostis, give us more Ale. 1758 J. BLAKE *Plan Marine Syst.* 3 If more room be wanted the orlop deck may be enlarged. 1804 W. CRUISE *Digest Laws Eng. Property* III. 413 Then the wife received some rent for the houses; and afterwards..the son was born, and..the widow received more rent: then the son died..and she received some more rent after his death. 1861 *Photogr. News Alm.* in *Circ. Sc.* I. 160/2 Add more silver, till the development is complete. 1927 P. G. WODEHOUSE *Meet Mr. Mulliner* ii. 56 At eleven o'clock he has his 'elevenses', consisting of coffee, cream, more bread and more butter. 1986 U. HOLDEN *Tin Toys* (1987) iii. 26 She put more coal on, rattling the poker and tongs.

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Authors' Addresses

Professor Kai von Fintel
 Department of Linguistics & Philosophy
 Massachusetts Institute of Technology
 Room 32–D884
 77 Massachusetts Avenue, 32–D808
 Cambridge, MA 02139-4307

Email: fintel@mit.edu

Web: <http://web.mit.edu/fintel/>

Professor Sabine Iatridou
 Department of Linguistics & Philosophy
 Massachusetts Institute of Technology
 Room 32–D824
 77 Massachusetts Avenue, 32–D808
 Cambridge, MA 02139-4307

Email: iatridou@mit.edu

Web: <http://web.mit.edu/linguistics/www/iatridou/index.html>