

## ANATOMY OF A MODAL\*

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### Introduction

A New Species: The “Sufficiency Modal” (SM)

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

Approximate meaning:

SUFFICIENCY Going to the North End is a way of finding good Gorgonzola.  
NON-NECESSITY There may be other places to find good Gorgonzola.  
EASINESS Going to the North End is easy.

### The plan for this talk

1. Ingredients and Variations in English and cross-linguistically
2. The Compositionality Puzzle
3. *Ne . . . que*
4. *only* and Scope-Splitting
5. Remaining and Further Puzzles

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## 1 Ingredients and Variations

### 1.1 The Basic Ingredients

- A necessity modal with a TELEOLOGICAL/GOAL-ORIENTED interpretation
- *only* (or *just*, *merely*, *etc.*)

### 1.2 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 [26], von Fintel & Iatridou [13], von Stechow et al. [27])

(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)
- To get good ice cream, you only have to go to the Star Market around the corner. (Tamina Stephenson, pc)
  - You only have to go to the Star Market around the corner and you'll get good ice cream.
  - (Just) go to the Star Market around the corner and you'll get good ice cream.

### 1.3 The necessity modal must be able to scope under negation

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

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

also, NPI-modals (cf. van der Wouden [29]):

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

#### 1.4 Ne . . . que

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

#### 1.5 The Mystery 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 [26], von Stechow et al. [27] 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. A(ssertion): nobody other than John was in the room  
 b. P(resupposition): John was in the room
- (24) John only watched “The Sopranos” on Sunday.  
 (The philistine did not watch the Cubs game!)

Rooth [24]:

- *only* is a cross-categorial operator.
- The base case is *only* combining with a sentence.

- (25)  $\text{only}_C(p)$   
 $C$  = set of alternative propositions  
 $p$  = the PREJACENT proposition
- Horn-style semantics:
  - a. A: no  $r \in C$  other than  $p$  is true
  - b. P:  $p$  is true (the “prejacent presupposition”)
- $C$ 's value is determined (partly) by the focus structure of the prejacent.

What does “other than” mean? Not just “non-identical with”.

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

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

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

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

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

### 2.3 $\text{only} + \text{have to} \neq \text{only have to}$

(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 Bread & Circus, that you have to go to New York City, that you have to go to Milan, that you have to go to Reykjavik, that you have to order from amazon.com, ... }
- 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 Bread & Circus, you don't have to go to New York City, you don't have to go to Milan etc.
- Presupposition: you have to go to the North End, or: in all of the good Gorgonzola worlds you go to the North End.

$\Rightarrow$  ? SUFFICIENCY, \* NON-NECESSITY, ? EASINESS.

### The Prejacent Problem:

- (29) To get good Gorgonzola, you only have to go to the North End.  
 $\neq$  To get good Gorgonzola, you have to go to the North End.

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)

Or a combination thereof . . .

### 2.4 An Attempt: Weakening the Prejacent Presupposition

Get rid of prejacent presupposition? All that's left would be:

- (30) 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 Milan etc.

But then how would we ever get SUFFICIENCY?

Moving to a weaker presupposition? Horn 1996 [19], see also Geurts & van der Sandt [16], Beaver [3]:

- (31)  $\text{only}_C(p)$   
 a. A: no  $r \in C$  other than  $p$  is true  
 b. P:  $\exists r \in C: r$  is true

This makes the same predictions for unembedded occurrences of *only*, and as such it will make the same wrong prediction for SM. (A difference from the Horn 1969 semantics only emerges in embedded contexts, which is what he uses to argue for the new semantics.)

But perhaps, there are more alternatives in play, namely “disjunctive” ones:

- (32) The value of  $C$ : {that you have to go to the North End, that you have to go to Bread & Circus, that you have to go to New York City, that you have to go to Milan, that you have to go to Reykjavik, that you

have to order from amazon.com, that you have to (go to the North End or go to Bread & Circus or go to Milan), ... }

Now, we could adopt the presupposition in (31). What could be true then is that there are three places to get good Gorgonzola.

But this would make bad predictions elsewhere:

(33) I only introduced everyone to [Peter]<sub>F</sub>.

- (34) a.  $C = \{I \text{ introduced everyone to Mary, I introduced everyone to Paul, I introduced everyone to Peter, I introduced everyone to (Mary or Peter), I introduced everyone to (Paul or Peter)}.$   
 b. (33) would be true if I introduced half the people to Peter and half the people to Paul.

⇒ unclear how weakening the prejacent presupposition would help.

## 2.5 Another Idea

Some inspiration from Beck & Rullmann [6: p. 261]:

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*.

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

Two options:

1. possibility  $\succ$  *only* ⇒ unlikely
2. negation  $\succ$  necessity  $\succ$  *more than* ⇒ maybe

### 3 Ne . . . que

- (36) Je n' ai vu que Jean  
 I NE have seen QUE Jean  
 "I only saw John."

#### 3.1 Basic Assumptions<sup>1</sup>

- We assume that *que Jean* introduces an existential quantifier over individuals "other than" Jean.
- Q: Is there a covert *something/anything?* Or is this all wrapped up in the meaning of *que* here?
- The *que*-phrase stands in an NPI-like licensing relation to the negation *ne*.
- (36) therefore means that it is not the case that there is someone other than John that I have seen.

#### 3.2 Ne . . . que and SM

In the SM construction, there is a necessity modal intervening between the negation and the *que*-phrase:

- (37) *ne* > necessity > *que*

We expect the following interpretation:

- (38) (To find good Gorgonzola), it is not necessary that you do something other than going to the North End.

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

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

$\Rightarrow \checkmark$  SUFFICIENCY,  $\checkmark$  NON-NECESSITY, ? EASINESS.

Not so fast.

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<sup>1</sup> Dekydtspotter's SALT 3 paper [8] provides the only extensive discussion of *ne . . . que* that we know of. We will not adopt his proposal.

### 3.3 But what about the Prejacent Presupposition?

But we have forgotten about the presuppositional part of the meaning of *only/ne ... que*.

- (40) Je n' ai vu que Jean.  
 $\Rightarrow$  I saw John.

OPTION A: Strong presupposition à la Horn 1969 [18]:

- (41) Q(que Jean):  
 A:  $\exists y (y \neq \text{Jean} \ \& \ Q(y) = 1)$   
 P:  $Q(\text{Jean}) = 1$

Now, (40) presupposes that I saw John and asserts that I didn't see anybody other than John.

But then what happens to the presupposition under the necessity modal in SM? Standard assumptions about presupposition projection in modal/quantificational structures predict that

- (42) not  $\succ$  necessity  $\succ$  que (go to the North End)

will presuppose that

- (43) all worlds where the goal is achieved are worlds where you go to the North End

Accommodation to the rescue?

Perhaps, the presupposition is locally accommodated. 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.

- (44) To get good Gorgonzola, you don't have to do anything other than going to the North End, *if you do that*.

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

OPTION B: Weaker presupposition à la Horn 1996 [19]:

- (45) Q(que Jean):  
 A:  $\exists y (y \neq \text{Jean} \ \& \ Q(y) = 1)$   
 P:  $\exists x (Q(x) = 1)$

No difference for unembedded case:

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

But significant difference for embedding in SM.

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

$\Rightarrow \checkmark$  SUFFICIENCY,  $\checkmark$  NON-NECESSITY, ? EASINESS.

### 3.4 Easiness

The last property of the SM construction we need to account for is EASINESS. We don't know its ultimate source. It turns out that a "diminishing" ingredient is part of the meaning of the *only / ne ... que*-operators in other cases as well:

- (48) a. Il' nest que soldat. "He is only a soldier."  
 b. No es más que soldado.  
 c. Dhen ine para stratiotis.
- (49) a. ??Dhen ine para o andi-proethros.<sup>2</sup>  
 b. ??Il n'est que le Vice-President.  
 c. ??No es más que el Vice-Presidente.
- (50) "truncated" scale:  
 I can't go in there. That club is for four-stars generals. I am only a three-star general.
- (51) ??To get good yak's milk, you only have to go to Ulan Bator.  
 (Bobaljik, pc)

## 4 Only and Scope-Splitting

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

### 4.1 Step 1: only = not + something other than

- (52) only (John was in the room)  
 $\Rightarrow$  not (someone other than John was in the room)

### 4.2 Step 2: Scope Splitting, or We all speak Greek, Part 2

The idea: scope splitting of negation from *something other than*-quantifier.

- (53) You only have to go to the North End  
 $=$  not have-to you something other 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. [21] and Potts [23].

- (54) I need no secretary.  
 (55)  $\neg$  I need [  $\exists$  (secretary)  $\lambda x$ . PRO to have  $x$  ].  
 (56) The company need fire no employees. (Potts [23])

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

- (57) “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 [25], Kratzer [20], Geurts [14], de Swart [28], Penka & von Stechow [22], Heim [17].

- (58) Fritz muß keinen Schlips anziehen.  
 Fritz must no tie wear.  
 “Fritz doesn’t have to wear a tie.”



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.  $\Rightarrow$  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

- 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?
- A deeper explanation of the EASINESS property?
- Why SM only with goal-oriented modals?
- The other variants:
  1. Anankastic version
  2. Conjunction of Result
- Other constructions with a sufficiency meaning:
 

(68)

  - a. It is enough to go to the North End.
  - b. It is sufficient to go to the North End.
  - c. All you need to do is go to the North End.

For more of the cross-linguistic data we have found, see our handout for the GLOW version of this talk:

<http://web.mit.edu/fintel/www/glow04.pdf>

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