Anatomy of a Modal

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I. Introduction: A new species: the Sufficiency Modal

(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 does (2) convey?

- Going to the North End is a way of getting good cheese
- Going to the North End is relatively easy
- It is left open whether there are other places to get good cheese

We propose the name "Sufficiency Modal" for this construction.

The purpose of this talk is an investigation of the Sufficiency Modal.

II. The Sufficiency Modal crosslinguistically

Crosslinguistically, the SM consists of the following ingredients:

A Modal Verb (*have to* in (2))

And one of

An element like *only* (the *only*-Languages: English, German, Finnish, Italian and more)

Or

NEG+ Exceptive (the *NEG+Exceptive*- Languages: Greek, French, Spanish and more)

Greek:

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

* The authors appear in alphabetical order. We would like to thank the participants in our Spring 2004 seminar and all our very patient informants.

French:

(4) Si tu veux de bon frommage, tu n'as qu'aller à North End
if you want good cheese you not have except go to the NE

At first blush, it seems intuitive that *only* can do the same job as Negation-cum-exceptive. After all, the following are equivalent:

(5) Only John
(6) Nobody came except John

III. Some environments in which SM appears

The SM can be studied in at least three environments.

- In construction with a purpose clause:

(7) To get good cheese you only have to go to the North End

- In anankastic conditionals (see Saebo (2001), von Fintel and Iatridou (2004), von Stecho, Krasikova, Panka (2004):

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

- In causal conjunction:

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

For the purposes of today's discussion we will be using mostly examples with purpose clauses. The modals that accompany purpose clauses here are "goal-oriented":

(10) To find good cheese you have to/ need to / must /ought to/ should go to the N.E.
(11) In all the worlds in which your goal of finding good cheese is satisfied, you go to the North End.

In von Fintel and Iatridou (2004) we argue that anankastic conditionals also contain goal-oriented modals. For causal conjunction, please check our class website at http://semantics-online.org/topics04/.

IV. Basic questions

So here are some of the questions that we will need to address:
(a '^' sign indicates that we do not yet have an answer we consider satisfactory)

- How do we derive the meaning of the Sufficiency Modal?
- What determines whether a modal verb can participate in the formation of SM?
- What determines whether a language uses NEG+exceptive in its SM?
- ^ What determines whether a language uses 'only' in its SM?
- How do we avoid the "Prejacent Problem"?
- ^ Why is the distribution of the possessive modal as it is?
- ^ How does causal conjunction work?

V. Can all goal-oriented modal verbs participate in the formation of SM? No

Until we have been looking only at the possessive modal as a building block of the sufficiency modal. Some other options exist as well.
In English, the modal *need* can also be the verbal element in SM:

(12) To get good cheese you only need to go to the North End
(13) If you want good choose you only need to go to the North End
(14) 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:

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

And modals with existential force like *can* also fail to yield SM:

(18) *If you want good choose you (only) can (only) to go to the North End
(OK on different reading)

In Greek, we find a similar situation in that the modal usually glossed as 'must' cannot form a sufficiency modal:

(19) *An thes kalo tiri dhen prepi para na pas sto North End
If want/2.sg good cheese NEG must na go/2.sg to the North End

But as in English, the universal modal that glosses as 'need' can form a sufficiency modal

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

In short, a modal verb can be a participant in a sufficiency modal only if it yields a universal reading, yet, not all universals will do.

The modal verbs *have to*, *need*, *echo*, *chriazete* pattern together in being capable of forming a sufficiency modal while *must, ought to, should* and *prepi* pattern together in not being able to. What else splits the universal modals in a similar way?

It appears that their scoping properties with respect to negation does. The ones that can form a sufficiency modal scope under negation:

(21) He doesn't have to go there NEG>modal (deontic)
(22) He doesn't have to have done that NEG>modal (epistemic)
(23) If you want good cheese you don't have to go to the NE.
NEG>modal (goal-oriented)
(24) He doesn't need to do that NEG>modal
(25) He need not do that NEG>modal

(26) Dhen chriazete na figis NEG>modal (deontic)
NEG need leave
'You don't need to leave'

(27) Dhen echo na dho ton yatro simera NEG>schedule
NEG have/1.sg see thedoctor today
'I'm not scheduled to see the doctor today'

On the other hand, the universal modals that cannot form a sufficiency modal scope over negation:

(28) You should not leave modal>NEG (deontic)
(29) He should not be there now modal>NEG (epistemic)
(30) He must not leave modal>NEG (deontic)
(31) He must not be there now modal>NEG (epistemic)
(32) You ought not to leave modal>NEG (deontic)

(33) Dhen prepi na ine eki modal>NEG (epistemic)
NEG must be there
'He must not be there'

(34) Dhen prepi na to kanume afto modal>NEG (deontic)

NEG must it do thi
'We must not do this'

(35) prepi na min ine eki modal>NEG (epistemic)
must NEG be there
'He must not be there'

So here is our generalization on this matter:

Universal modal verbs can participate in a sufficiency reading only if they scope under negation.

We have found no counterexample to this. Which modals scope under negation in a given language depends on a lot of factors (see Picallo 1990, Cormack and Smith 2003 and others). For example, English *must* scopes over negation, as we just saw, while German *mussen* scopes under it:

(36) Du musst das nicht machen
You must that not do
NEG>modal
'You don't have to do that'
*'You must not do that'

But once that determination is in place, the generalization above seems to hold absolutely. For example, unlike English *must*, German *mussen* can appear in SM:

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

VI. Can all Exceptives participate in the formation of SM? No

We will illustrate the point here in Greek and French but the observations hold for every single language that we have seen using NEG+exceptive in the sufficiency modal.

Greek is described as having at least two types of exceptive constructions *ektos* and *para*. The first obvious difference is that *para* can only[1] appear in negated sentences whereas *ektos* can appear in affirmative as well as negated sentences:

[1] And not in other DE environments:
i. *Irthan oli para mono o Yanis
came everyone para Yanis
attempted: "Did everyone come except John"

(38) Dhiavasa ta panda **ektos** apo afto to vivlio
I-read the everything except from this the book
'I read everything except this book'

(39) *Dhiavasa ta panda **para** afto to vivlio
read the everythikng para this the book

(40) **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'

(41) **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 sufficiency modal it is *para* that appears. The exceptive *ektos* cannot:

(42) **dhen** echis **para** na pas sto North End
NEG have para go to the North End

(43) ***Dhen** echis **ektos** na pas sto North End

Why can't we use *ektos* in SM? The same question appears for all the other languages that we have seen employing NEG+exceptive in the sufficiency modal. That is, all of these languages have more than one exceptive word, yet only one of them is used in the sufficiency modal. How do they pick which one?

In addition to the NPI-status of *para* (the exceptive that appears in the sufficiency modal) there is another difference between *ektos* and *para* that may provide the answer to this question. 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 NP restrictor of the quantifier that the exceptive operates on (von Fintel 1995). The boldfaced item is the host:

(44) Every **boy** except John left
(45) No **boy** except John left

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*An erthun oli para (mono) o Yanis…
if come everyone para Yannis
'If everyone besides comes besides John…

Such sentences are fine with *ektos*.

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

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

(47) *Dhen irthe ektos apo ton Yani sto parti
NEG came except from the John to the party

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

Given that no overt host is present in the sufficiency modal, we expect *ektos* not to be able to occur.

We find the same situation in French, which also has three exceptives: *sauf, a part* and *ne que*.

(49) **Personne** n' est venu sauf / a part Jean
Nobody not is come except Jean
'Nobody came except Jean'

(50) Je n'ai **rien** mangé sauf/a part une pomme
I not have nothing eaten except an apple

And the hostless exceptive:

(51) Je n'ai mangé qu'une pomme[2]
I not have eaten than an apple

Only *ne que* can appear without an overt host and it is only *ne que* that can appear in the sufficiency modal:

(52) Si tu veux de bon fromage, tu n' as qu' aller à North End
if you want good cheese you not have except go to the NE

….*…tu n'as sauf…
….*…tu n'as à part

In Spanish, the hostless exceptive appears with the additional element *màs*:

[2] In French *ne que* cannot appear on the subject nor can English *but*. However, if the hostless exceptives need to be in the scope of negation and if only Greek can have postverbal subjects of these three languages than we expect to find this difference.

(53) No he visto màs que Juan
Not have seen more than Juan

This is also how the hostless exceptive appears in the sufficiency reading of PM:

(54) …. No tienes màs que ir al North End
not have more than go to the NE

So it appears to be the case that to use an exceptive in the sufficiency modal the language needs to have an exceptive that can go hostless.

VII. The Prejacent Problem

The term "prejacent" comes from the literature on *only*.
The prejacent proposition is the proposition without *only*. For example, For (55a, 56a), the prejacent propositions are (55b,56b) rspectively:

(55)a. Only John arrived
b. John arrived

(56)a. I only saw John
b. I saw John

Accounts differ on whether the prejacent proposition is asserted or presupposed. However, they all have in common that the prejacent proposition is true. In other words, existing accounts all incorporate the fact that (55a) entails (55b) and that (56a) entails (56b).

In SM, however, the prejacent proposition is not true.
Consider:

(57) To get good cheese you only have to go to the end

Prejacent proposition:
(58) To get good cheese you have to go to the North End

Does (57) entail (58)?
It does not.

Sentence (58) says that the only place to get good cheese (in Boston) is the North End.

[all the worlds in which you achieve your goal of getting good cheese are worlds in which you go to the North End]

On the other hand, the sentence with the sufficiency modal (57), is fully compatible with there being many places in Boston where you can get good cheese. In fact, the SM is infelicitous when there is only one way to achieve one's goal:

(59)??? To go to college, you only have to graduate from high school first
(compare with *To go to college, you have to graduate from high school first*)

In short, (57) does not entail (58).

We can also set up the equivalent of the Prejacent problem in languages that use NEG+Exceptive in SM. As prejacent, we will consider the proposition without NEG+Exceptive.

Consider (60a, 61a), and their "prejacent" (60b, 61b), which are entailed:

(60)a. Dhen irthe para mono o Yanis
NEG came except only Yanis
'Nobody came except Yanis'

b. Irthe o Yanis
came Yanis
'Yanis came'

(61)a. Dhen idha para mono ton Yani
neg I-saw except only Yani
'I didn't see anyone except Yani'

b. Idha ton Yani
I-saw Yani
'I saw Yani'

But in SM, we see that the entailment does not go through[3]:

(62) ya na vris kalo tiri dhen chriazete para na pas sto North End[4]
to find good cheese NEG need except go to the North End

does not entail

[3] This argument cannot be illustrated with the modal *echo* for reasons that will become clear later.
[4] As in the SM with *only*, this SM is also best when there is more than one way to achieve one's goal:
(i) ???Ya na pas sto panepistimio dhen chriazete para na apofitisis prota apo to yimnasio
Compare with
(ii) Ya na pas sto panepistimio chriazete na apofitisis prota apo to yimnasio

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

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

VIII The NEG+Exceptive Languages

We will start with the NEG+Exceptive languages as they give us a thread with which we can start unraveling the puzzle.
We will consider French, Greek and Spanish:

(64) … tu n' as qu' aller à North End
…. You NEG have QUE go to North End

(65)….dhen echis para na pas sto North End
….NEG have PARA na go to the North End

(66) ….no tienes màs que ir al North End
…NEG have more than go to-the North End

The French *ne… que…* construction has been described as an exceptive (Kayne, Dekijdspotter among others):

(67) Je n'ai vu que Jean

But, of course, *que*-clause have many uses, including comparative:

(68) Elle est plus intelligente que lui

What about Greek *para*?
According to dictionaries and grammars it has several meanings but it is definitely listed as having the two that have entered the discussion of French above as candidates, namely exceptives and comparatives[5]:

Exceptive:
(69)a. Dhen tha dhechto tipota para mono ena gliko, ya na min sas prosvalo (G)
NEG FUT accept nothing except only one sweet, so as not to you insult
'I will except nothing except a sweet so as not to insult you'

b. Dhen akuyete tipota alo para o thorivos ton vimaton tu (B)
NEG is audible nothing other except the sound of the steps his

[5] In my judgements, *mono* is possible in (69) but not in (70). It is also possible in (74c) below.

'Nothing is audible except the sound of his steps'

Comparative (with the meaning *more than, over, rather tha*):

(70)a. Protimo na pethano para na tapinotho parakalondas ton (G)
I prefer to die over to be humiliated begging him
'I prefer to die rather than being humiliated by begging him'

b. Kalio pende ke sto cheri para dheka ke karteri (G)
Better five in the hand than ten and wait

c. Kalio arga para pote (B)
Better late than never

d. Evlapse para ofelise tin ipothesi mas (B)
Harmed more than helped the cause our
'S/he/it harmed more than helped our cause'

In Spanish also, the relevant morphosyntax is described as an exceptive:

(71) No he visto màs que a Juan
Not have seen except Juan

But of course it is also a comparative:

(72)a. Leyo màs que Juan
I-read more than Juan

b. Lo quiero màs que a Juan
him I-love more than Juan
'I love him more than (I love) Juan'

We already saw that as exceptives these elements are hostless. But also, they do not appear to be well-behaved exceptive operators on quantifiers. To be a board-certified exceptive, you should be able to occur in the following positions[6] (von Fintel 1995):

(73) every student EXCEPT John
no student EXCEPT John

None of the (hostless) exceptives used in SM can do that.

The final property that this NEG+Exceptive morphosyntax exhibits in all three languages is that it is "diminisher":

[6] And you should not be able to occur in these: *four students EXCEPT John*, *several students EXCEPT John*

(74)a. Il n'est que soldat
b. No es mas que soldado
c. Dhen ine para stratiotis
'He is only a soldier'

The sentences in (70) assert that the person we are talking about is a soldier and somehow conveys that being a soldier is a lowly thing to be.

So the morphosyntax that accompanies the modal verb in SM in NEG+exceptive languages shares the following properties:

I. It can be described as having exceptive and comparative uses.
II. As an exceptive it is unusual in that it cannot function as as exceptive operator on quantifiers. In fact, it is hostless.
III. It is a diminisher

This would be too strange a coincidence. We will propose that, in fact, it is Greek and Spanish that carry the meaning of this "exceptive" on their sleeves (*para* and *mas que*). Specifically, we argue that we are not dealing with an exceptive at all but with a comparative.

That is, the NEG + Exceptive we have been talking about in SM is instead NEG+more than:

(75)a. NEG + ~~Exceptive~~
b. NEG + more than

This takes care of properties I-II automatically, of course. But it doesn't take care of property III, namely the properties a diminisher has. There are two reasons for this.

First, consider the following scenario.

My department has just moved into a fancy new building designed by Gehry. The building is not complete so while we are holding classes and appointments with students, electricians, plumbers and all sorts of construction workers walk in and out of our rooms and classrooms. I have become quite friendly with some of these people. You, being somewhat of a snob, ask me if I mind having my lunch with the construction workers. I want to answer (76):

(76) Why should I mind? I am not (anything) more than a construction worker.

But I cannot say this using the *NEG+more than* morphosyntax in Greek, French or Spanish:

(77)a. Dhen ime para idhravlikos

b. Je ne suis que plombier
c. No soy màs que plomero
'I am only a plumber'

In other words, you can say (70) only if *I am a plumber* is true (possibly as a presupposition). This does not follow from just the meaning of *NEG+more than*. Something in addition must be going on but for now we will just stipulate this as a property of diminishers

Diminisher Stipulation I: The sentence without *NEG+ more than* is true –possibly as a presupposition..

The second reason that saying that a diminisher contains *NEG+more than* does not account for basic properties of being a diminisher (property IV), is the oddness of the sentence when the predicate is high on some contextual scale, e.g. of importance[7]:

(78)a. Dhen ine para o andi-proethros
b. Il n'est que le Vice-President
c. No es màs que el Vice-Presidente

'He is only the vice-president'

In short, it does not follow from the meaning of NEG+more than that a diminisher conveys that the predicate is low on some relevant scale[8]. We will also leave this as a stipulation for now:

^Diminisher Stipulation II: The compared item is low on some contextually relevant scale..

We will come back to Diminisher Stipulations I and II later on.

IX. Back to the Sufficiency Modal

What we have then, is that SM in Greek, Spanish, French looks as follows:

(79) Not need/have-to [you (more than go to the North End)][9]

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

[7] These sentences are good only if we consider truncated scales, as in
(i) I can't go in there. That eating club is for four-star generals. I am only a three-star general.
[8] We have consulted the literature on scalar uses of only, as in *I am only a plumber.* However, we did not find anything that we can unproblematically apply to the diminishing uses of NEG+more than. Frankly, we didn't think these theories were unproblematic for scalar *only* either.
[9] Even though this frame represents Greek, French and Spanish, we choose these modal verbs because they are the only ones that in English scope under negation.

It can do so overtly in English:

(80)a. He more than made up for his mistake
b. What he lacks in competence he more than makes up in persistence
c. Whatever harassment he gets from the Left he more than deserves

d. He did something more than make up for his mistakes[10]

So *more than VP* is a quantifier over predicates:

(81) màs que ir al North End
more than go to the 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…
→ a quantifier over predicates
$\lambda Q.\exists P$: P is more than going to the North End and Q(P) = 1

(82)a. To get good cheese, NEG need/have-to [you (more than go to the North End)]
b. To get good cheese, NEG need/have to [you (do something more than go to the N.E.)]

And given that *need/have to* have universal force, we read (82) as (83):

(83) In not all the worlds in which your goal of getting good cheese is satisfied, do you do some P more than going to the North End. [NEG>have-to>$\exists$]

which is the same as:

(84) In some worlds in which your goal of getting good cheese is satisfied, you do no more than going to the North End.

This correctly captures that nothing more than going to the North End is required for getting good cheese.

X. But we're not entirely there yet!

What does it mean for a predicate P to be "more than" going to the North End*?*

[10] In English, as in Greek, French and Spanish, the question (which we do not address here) arises of whether there is a covert *do* and/or a covert *something/anything* or whether it is all wrapped up in the meaning of *more*::

(I want) Peter to ~~do~~ ~~something~~ more than make up for his mistakes
No tienes ~~hacer~~ ~~algo~~ mas que ir al North End

Attempt 1: *more than going to the North End* = It requires more effort than going to the North End

Won't work. Here is a different illustration of the problem (due to Thony Gilles):
My dog Chaucer has run away. We go off in different directions looking for him. You come back saying:

(85) I went as far as the North End but I didn't find him.

I then say

(86) I went as far as the North End too and I didn't find him

I can say (86) without having gone to the North End, as long as I have gone (at least) as far as the North End.

We get the same problem if we say that *something "more than" going to the North End* means *something that requires more effort than going to the North End.*

It predicts that if there is no good cheese in the North End but instead the good cheese is to be found in Medford you can say (87), as long as going to Medford is (at least) as easy as going to the North End:

(87) …NEG need/have to you (more than going to the North End)]
(88) In some good cheese worlds you don't do anything more effortful than going to the North End (which is the same amount of effort as going to Medford)

then (87) would be compatible with your going to Medford to get good cheese, as long as going to Medford is at least as easy as going to the North End.

Attempt 2: *more than going to the North End* = it requires something **in addition to** going to the North End
This will work.

(89)a. …NEG need/have to [you (more than going to the North End)]
b. In some good cheese worlds you don't do anything **in addition to** going to the North End

Now (89a) entails that you go to the North End. The Medford Problem does not arise. If we incorporate Diminisher Stipulation 2 (focus low on a scale), we have exactly the meaning of the Sufficiency Modal.

Now we can also accounted for Diminisher Stipulation 1 (the proposition without *NEG+more than* has to be true):

(90)a. Dhen ine para idravlikos

b. No es màs que plomero
c. Il n'est que plombier
'He is only a plumber'

He NEG is something **in addition to** a plumber

So we derive something else that we had wanted to derive.

How reasonable is it to give the meaning of *in addition to* to **more than**? Quite reasonable. Consider (91a), which is ambiguous between (91b) and (91c):

(91)a. This necklace costs more than the chair
b. This necklace costs more than the chair costs
c. (in an exchange) To get the necklace you need to give the chair and something in addition to it.

(92)a. I want more milk
b. I want more milk than John has
c. I want milk in addition to the milk that I have

XI. The only Languages

English, German, Finnish, Spanish

(93) To find good cheese, you only have to go to the North End

We could say (94)

(94) *only = nothing in addition to*

(95)Only John was in the room
presupposition: John was in the room
assertion: There was nobody in the room in addition to John

But applied to SM, this still meets with the Prejacent Problem:

(96) You only have to go to the North End
(97) There is nothing in addition to going to the North End that you have to do

But (97) still runs into the prejacent problem since it entails that you have to go to the North End.

Solution: scope splitting of negation from the *in addition to*-quantifier.

(98) You only have to go to the North End

(99) Not **have-to** you more than (in addition to) go to the North End

Usuallly scope-splitting is

(100) no = ~ + □
with ~ taking scope higher up.

English has only limited scope-splitting with negative quantifiers, but see Larson et al (1997) and Potts (2000).

(101) I need no secretary (ambiguous)
(102) I need to have no secretary
(103) ~I need [□ (secretary) □x. PRO to have x]

In other languages, this is a more widespread phenomenon, see among others Rullmann (1995), Kratzer (1995), Geurts (1996), de Swart (2000), Penka and von Stechow (2001), Heim (2001).

Some more examples:

(104) Fritz muss keinen Schlips anziehen
Fritz must no tie wear
"Fritz doesn't have to wear a tie"

(105) Alle Aerzte haben kein Auto
all doctors have no car
"Not Every doctor has a car"

In (104, 105) we see that scope-splitting occurs across modals that scope under negation. With modals that scope only over negation, scope splitting cannot occur.

So scope-splitting *only* makes the *only*-languages look like the Greek, Spanish, etc, that is the *NEG+more than* languages::

(106) only have to VP
(107) ~ have-to □P in addition to VP □Q . you Q

This completes the successful part of the program.

Now to some of the unsolved problems.

Unsolved problem #1: No goal-oriented possessive modal in Greek (and French…)

We have seen that the verbal element in SM is a universal goal-oriented modal that scopes under negation. In English these are *need (to)* and *have to*. In Greek *chriazete* (need) and *echo* (have). We saw above how the goal-oriented modal verb composes with the other elements to yield the SM. In Greek (and some other languages, e.g. French) this is actually somewhat of a problem because the plain possessive modal lacks the goal-oriented meaning. Here is the possessive modal in Greek:

No epistemic reading:

(1) *O Yanis echi na ine spiti tora
the Yannis has NA is home now.
Attempted: "John has to be home now"

Compare with:

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

No goal-oriented reading:

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

Compare with

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

As for the deontic reading, it is a little bit more involved to show that Greek lacks this, given that (5), is, in fact, a grammatical Greek sentence:

(5) Echo na dho ton yatro
Have/1sg na see the doctor

What does (5) mean? We will argue that (5) has a schedule reading and not a deontic reading[11]. That is we argue that (5) means *I am scheduled to see the doctor*. How do we know this?
For one, if the deontic source is made explicit, which would rule out the schedule reading, the sentence becomes ungrammatical:

(6) Simfona me tus kanonismus,
According to the rules,

[11] Many thanks to Elena Anagnostopoulou for discussing these examples with us.

o Yanis echi na pari adhia apo tin Susan kathe fora pu theli na vgi ekso
the John has na take permission from the Susan every time that wants to go outside

The sentence with *prepi* ('must') is of course fine:

(7) Simfona me tus kanonismus,
According to the rules,

o Yanis **prepi** na pari adhia apo tin Susan kathe fora pu theli na vgi ekso
the John **must** na take permission from the Susan every time that wants to go outside

Similarly, all the following sentences are fine with **prepi:**

(8) *Simfona me ton nomo echis na katharizis to pezodhromio su mia fora tin evdhomadha
According with the law have/2sg na clean the sidewalk your one time the week
Attempted: "According to the law you have to clean your sidewalk one time per week"

(9) *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"

(10) *Echo na apofevgo to krasi ya dhio evdhomadhes
have/1sg avoid the wine for two weeks
Attempted: "I have to abstain from wine for two weeks"

In short, (5) 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 on more test. The English possessive modal can be used when no appointment exists and it can therefore be uttered felicitously in the following context:

(11) 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:

(12) Echo na dho ton yatro simera. #Thimise mu na tilefoniso ke na kliso randevu
have/1sg see the doctor today. Remind me call and close 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 Georgian.

Here is a table with the possible interpretations of the possessive modal in some languages:
Table 2: Languages and their possessive modals:

	deontic	epistemic	goal-oriented	schedule	sufficiency
Greek	-	-	-	+	+
French	-	-	-	-	+
Italian	-	-	-	-	+
Br. Port.	+	+	+	-	+
Romanian	-	-	-	+	+
E.Spanish	+	+	+	-	+
SA. Spanish	+	+	+	-	+
Catalan	+	+	+	-	+
English	+	+	+	-	+
German				-	+
Icelandic	+	+	+	-	+
Bulgarian	-	-	-	+	+
Russian, Japanese, Korean	-	-	-	-	-
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 SM, which we have claimed uses a goal-oriented modal.

So how bad is it that the base modal does not have the interpretation that we need? 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 SM 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, when we understand how possessive modals obtain their modal bases we will achieve a better understanding of this particular problem also.

Unsolved Problem # 2: The licensing condition for *only* in SM.

What about the licensing condition for *only* in the sufficiency modal? We have entertained the hypothesis that in order to for *only* to appear, *only* has to be an NPI lisencer. This appeared to be correct in the beginning but we found counterexamples.

Table 1:

	Only etc	*Only* NPI lic
Greek	-	-
French	-	-
Italian	+	-
Romanian	-	-
E.Spanish	+	-
SA. Spanish	+	-
English	+	+
German	+	+
Croatian	-/	- /?
Hindi	+	+
Finnish	+	+

Is the hypothesis for *only* salveagable in light of the facts in e.g. Italian? Is it possible that a weakly licensing condition is good enough? Consider also elements like *merely* and *barely* (Horn 2000).

Another option we tried was that *only* can appear in SM in a language if it can associate with its focus at a distance. This is true for e.g. English. Sentence (13) is ambiguous.

(13) I only introduced Bill to Peter
Bill is the only person I introduced to Peter
Peter is the only person I introduced Bill to

Greek *only* cannot do this. German *only* can. So it places some languages correctly but not all. Italian *only* behaves like Greek *only* but unlike Greek *only* it can be used in SM.

We also entertained the possibility that the syntactic placement of *only* places a role.

Whatever the licensing condition on *only* is, it is separate from the licensing conditions on *NEG+More than*, as there are languages that can use either in the sufficiency modal**.**