Senses of Modern Greek Weak Modal, and Verbal Aspect

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Senses of Modern Greek Weak Modal, and Verbal Aspect μπορῶ

The semantic force 'can' appears to influence the aspect of its complement. Its two basic senses are those of permanent competence ('possibility'$_1$) and appropriate state for realization of competence ('possibility'$_2$). This distinction in turn depends on the scope relations of underlying modal operators and expressions of temporal specification. While deontic and epistemic reading always involve wide scope modality the physical ability/success meanings exploit the full range of basic logical schemata and aspectual choice is determined by the usual entailment relations linking these schemata in common systems of quantified modal logic.

1. It is a commonplace observation that modal lexemes in many languages may carry a wide range of semantic nuances[1]). English *may*, for instance, bears in some cases an epistemic force (*it may rain tonight*), in others a deontic one (*you may leave, Jenkins*); *can* may denote physical ability (*I can lift 100 kilograms*); skill (*I can play the virginal*), success (*I can see her now*), presence of favourable conditions (*we can go out and play now that it's stopped raining*) or relative frequency (*footballers can be sex maniacs*). The commonest expression of weak modality in modern Greek, the verb μπορῶ, is capable of carrying all the senses of English *can* and *may*. However, the aspect (perfective/imperfective) of its complement, as well, to some extent, as its own, will in many cases provide a clue as to the precise modal force intended[2]). The question which naturally poses

[1]) I am grateful to the John Simon Guggenheim Foundation for the award of a Fellowship enabling me to devote the academic year 1974–75 to the study of Modern Greek verbal aspect, and to the Canada Council for enabling me to continue this research in the Fall of 1978 in Greece and Cyprus; also to the staff of the University of Thessaloniki for their co-operation and hospitality.

[2]) In addition to participles modern Greek possesses a set of second person imperative forms categorized for aspect (perfective/imperfective) and voice (active/passive) as well as eight sets of forms categorized in addition for tense (past/nonpast). More traditional accounts treat the nonpast perfective as a 'subjunctive' as it occurs only embedded after the complementizer *νά* and in one or two other constructions in which Ancient Greek selected the subjunctive; also when the nonpast imperfective is so employed it is known as the 'subjunctive', in which case it must be regarded as accidentally homophonous with the 'present'. The equations linking our terms and the more traditional ones are: past perfective = aorist, past imperfective =

itself, and to which we shall address ourselves, is: are the correlations observed to link modal sense and verbal aspect arbitrary, or is it possible to provide a rational, unitary account of them? We hope to show that these correlations are in fact by no means arbitrary but are governed by a simple and elegant logic. Before turning to our central topic, the physical ability/skill uses of *μπορῶ*, we offer a few comments on epistemic and deontic modality.

(i) Epistemic modality. When we utter some such sentence as *I may come tomorrow* or *it may rain every day next week* we are in effect claiming that the occurrence of the event or events specified is consistent with the data accessible to us at the time of utterance or, in the case of 'objective' epistemic modality, with intersubjectively verifiable data (for the distinction between subjective and objective epistemic modality see Lyons 1977:797).

Knowledge is not something which comes and goes and is indeed quintessentially a persistent state (or disposition if one is to believe the tenets of logical behaviourism). This being so we can hardly regard *consistency* with knowledge as itself intermittent. In order to tie in these observations with the types of data we are seeking to explain, let us consider the following Greek sentences (1–3).

(1) *μπορεῖ νὰ ἔρθουν οἱ Τοῦρκοι* 'The Turks may come (pf.).'

(2) *μπορεῖ νὰ ἔρχονται οἱ Τοῦρκοι κάθε μέρα* 'The Turks may come (impf.) every day.'

(3) **μπορεῖ νὰ ἔρθουν οἱ Τοῦρκοι κάθε μέρα* 'The Turks may come (pf.) every day.'

In order to account for the unacceptability of (3) we must first note that the adverbial phrase *κάθε μέρα* belongs to a large open class of expressions which have as their basic syntactic property that the highest verb in the clause referring to the event whose frequency they specify is obligatorily in the imperfective aspect. Thus the verbs in the following sentences are automatically assigned imperfective aspect.

(4) *ἔρχονταν κάθε μέρα* 'They came (impf.) every day.'

(5) *ἔρχονταν συχνὰ* 'They came (impf.) often.'

(6) *ἔρχονταν τρεῖς φορὲς τὴν ἡμέρα* 'They came (impf.) three times a day.'

These same sentences with the perfective form of their verbs (*ἦρθαν*) would be ungrammatical. It is worth noting that while such expressions of rate of occurrence ('rate expressions') themselves select imperfective aspect, expressions indicating a finite totality of occasions ('once', '1,000,003 times') select the perfective, so that the operating factor is not multiplicity per se but relative frequency.

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imperfect, present perfective = aorist subjunctive, present imperfective = present indicative/present subjunctive. There is no infinitive. A structure such as 'I can come' is expressed as *μπορῶ νὰ ἔρθω*, literally, 'I can *νὰ* I come (perfective nonpast)'. For some discussion of issues related to those reviewed in this paper see Newton (1979) and the bibliographical references cited there and Newton and Veloudis (1980).

This being so it is a reasonable guess that the unacceptability of (3) stems from the fact that the rate expression *κάθε μέρα* qualifies the verb 'come' (or the underlying clause 'the Turks come') and it is accordingly incorrectly assigned the perfective aspect. However, this cannot be the whole story: in order to complete it we must explain how it is that the rate expression cannot refer to ('have within its scope') the matrix verb *μπορεῖ*. For there is nothing wrong with (7).

(7) *μπορούσα νὰ ἔρθω κάθε μέρα* 'I was able (impf.) to come (pf.) every day.'

In (7) the scope of the rate expression is unambiguously *μπορούσα* as the complement *ἔρθω* is automatically eliminated by reason of its perfective aspect. The problem is accordingly to explain why the (present) imperfective verb *μπορεῖ* in (3) cannot similarly fall under the scope of *κάθε μέρα*. It is here that we must revert to semantic considerations. The *μπορεῖ* of epistemic modality represents a continuous state (of consistency with the speaker's knowledge), whereas rate expressions must necessarily characterize intermittent states or repeated events. This amounts to the claim that expressions of epistemic modality will always have wide scope over any rate expression in the sentence they dominate (in underlying structure as commonly assigned). That epistemic *μπορεῖ* dominates semantically and syntactically all else in its sentence is confirmed by an important idiosyncracy of the form: it is always third singular present, a fact readily explicable on the assumption that it acts as the predicate of the sentence composed of the residual material[3]). Thus a natural analysis of (3) would be (8).

(8) [*θὰ ἔρθουν οἱ Τοῦρκοι*] *μπορεῖ* '(The Turks will come) is possible.'

Epistemic *μπορεῖ* then will invariably have wide scope over any rate expression and this reflects the fact that it indicates what we shall call 'possibility$_1$', which is viewed by the language as an uninterrupted state incapable of qualification by a rate expression.

(ii) Deontic modality. The lexeme *μπορῶ* in its deontic senses denotes the concept of permission. It is reasonable to assume that permission to perform a single act will characteristically be valid until advantage is taken of it and that when a finite number of acts is involved the permission will remain in force up to the time of performance of the final act in the series. This is particularly clear in the cases where a present imperfective form of *μπορῶ* (normally second person) is used in order to actually bring into

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[3]) That epistemic *μπορεῖ* is always in the present tense in main sentences is a natural consequence of its sense: some event (past, present or future) is consistent with present knowledge. Future events will be expressed by the perfective present if associated covertly or overtly with a temporal determinant of perfective aspect; present events are expressed by the present subjunctive and past ones by perfective or imperfective past forms according to the rules for aspectual choice operative for future events. The use of past verbs in the complement of modals is virtually confined to their epistemic uses, and we may assume for the remainder of the discussion that the complement verbs of *μπορῶ* will be in the perfective or imperfective present.

existence the freedom to perform some act (i.e. is a 'directive' in the sense of Lyons 1977:745). Consider for instance (9).

(9) *μπορεῖς νὰ ἔρθεις αὔριο* 'You may come (pf.) tomorrow.'

The utterance of this sentence brings into existence (on one common interpretation) permission for the addressee to come some time during the following day which presumably expires when the coming is realized. At any moment between the moment of speech and the event of coming it is the case that the addressee is allowed to come during the day indicated. Thus the situation corresponds roughly to that diagrammed in figure 1.

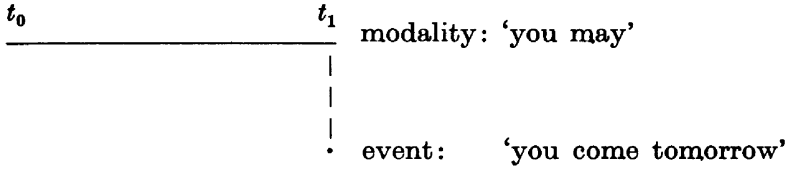

Figure 1: *Diagrammatic representation of the sentence 'you may come tomorrow'*

The 't_0' indicates the moment of speech and the 't_1' the time at which the addressee takes advantage of the permission. The question which now arises is: what happens when the permission covers not the performance of one or any other specified number of acts but has rather the character of a standing permission to act whenever the appropriate conditions arise? We wish to claim that because, as with epistemic modality, deontic modality is conceived as existing continuously it must have wide scope over rate expressions, which in turn can only qualify the complement verb, which will accordingly be assigned imperfective aspect. This will account for the fact that (10) is more readily accepted than (11).

(10) *εἶσαι καλὰ πιά. μπορεῖς νὰ κολυμπᾶς τρεῖς φορὲς τὴν ἡμέρα* 'You are well now. You can swim (impf.) three times a day.'

(11) **εἶσαι καλὰ πιά. μπορεῖς νὰ κολυμπήσεις τρεῖς φορὲς τὴν ἡμέρα* 'You are well now. You can swim (impf.) three times a day.'

In both sentences it sounds as if doctor's advice is being proffered and as such advice (or permission) is construed as extending over the swimming events whose occurrence it covers the rate expression necessarily qualifies the complement, in which case the complement verb is obligatorily in the imperfective aspect. An appropriate representation of (10) might be as in figure 2.

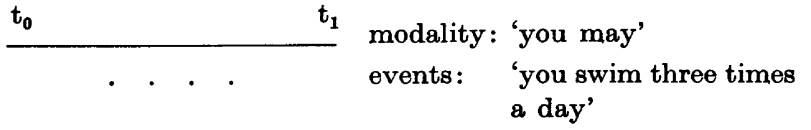

Figure 2: *Diagrammatic representation of 'you may swim three times a day'*

In the case at least of what are prima facie general laws and regulations we would claim that the use of an imperfective complement represents the normal, unmarked case, and that a perfective choice would seem to demand temporal specification. For instance, while (12) is normal, (13) as it stands seems to be incomplete.

(12) *ὁ νόμος ὁρίζει ὅτι οἱ φυλακισμένοι μποροῦν νά δέχονται ἐπισκέψεις* 'The law ordains that prisoners may receive (impf.) visits.'

(13) *?ὁ νόμος ὁρίζει ὅτι οἱ φυλακισμένοι μποροῦν νά δεχτοῦν ἐπισκέψεις* 'The law ordains that prisoners may receive (pf.) visits.'

A person hearing (13) would naturally be tempted to ask 'when is that?' and expect the speaker to provide a reply such as 'next Saturday'. In so far as it may be claimed that expressions of deontic modality take an imperfective complement in unmarked cases, this principle clearly stems from the fact that it has wide scope over any overt or covert rate expression in its complement. We tend when temporal specification is absent and the non-linguistic context unhelpful to assume that standing permission is being offered. As we shall see, most other senses of *μπορῶ* represent the converse of this in that in unmarked cases we find a perfective complement; an imperfective complement suggests the query 'how often?'. We shall say nothing further about epistemic and deontic modality.

2. The sort of problems tò which we now address ourselves may be illustrated by sentences (14) to (19).

(14) *μπορῶ νὰ παίξω πιάνο* 'I can play (pf.) the piano.'

The imperfective *παίζω* would be unusual unless the sentence continued with some specification of frequency such as 'five hours a day' *πέντε ὧρες τὴν ἡμέρα*. But as the perfective usually implies a finite number of occurrences and as skills entail the competence to carry out a particular type of routine whenever the occasion arises, one would imagine that the imperfective would be better suited.

(15) *μπορῶ νὰ σηκώσω ἑκατὸ κιλά* 'I can lift (pf.) 100 kilos.'

The same puzzle arises as with (14). In general a person who has the physical ability to perform an action which is in principle repeatable (in the sense in which smashing a particular piano with a karate blow is not) has the ability to perform it on an indefinite number of occasions. Yet the same perfective aspectual choice is made in (15) as would be made in reference to a nonrepeatable feat of strength (e.g. *μπορῶ νὰ σπάσω αὐτὸ τὸ πιάνο μὲ μιὰ γροθιὰ τοῦ καράτε* 'I can smash that piano with one karate blow'). Now consider (16) and (17).

(16) *μπορῶ νὰ σηκόσω ἑκατὸ κιλὰ τρεῖς φορὲς τὴν ἡμέρα* 'I can lift (pf.) 100 kilos three times a day.'

(17) *μπορῶ νὰ σηκώνω ἑκατὸ κιλὰ τρεῖς φορὲς τὴν ἡμέρα* 'I can lift (impf.) 100 kilos three times a day.'

There is often felt to be a difference in meaning between such aspectual pairs as (16) and (17). It does not appear in the present instance that there can be any difference in the frequency of events as this is explicitly specified as thrice daily. So what precisely can this difference be?

(18) *μπορούσε νὰ ἔρθει ἀλλὰ δὲν ἦρθε* 'He was able (impf.) to come (pf.) but he didn't come (pf.).'

(19) **μπόρεσε νὰ ἔρθει ἀλλὰ δὲν ἦρθε* 'He was able (pf.) to come (pf.) but he didn't come (pf.).'

The second of these sentences is ungrammatical although the first conjunct in isolation is quite unobjectionable. What is wrong therefore with (19)?

The questions raised by these examples represent on the face of it quite a mixed bag. It is our aim to provide a unified framework for their solution.

The first intuitive distinction which strikes one emerges from a comparison of (14) and (15) on the one hand and (16) and (17) on the other. (14) and (15) appear to refer to the possession of a permanent competence to perform acts of the type specified: (16) and (17) indicate rather the relatively brief periods when this competence is available for performance. That is, the *can* (say, 'can$_1$') of (14) and (15) differs from the *can* (say, 'can$_2$') of (16) and (17) in so far as the latter indicates the frequency with which the subject is able to realize the potential which would be referred to by 'can$_1$'. If we label these uses 'possibility$_1$', 'possibility$_2$' we may regard possibility$_1$ as extending continuously through time, while possibility$_2$ exists sporadically at such points in time as are specified by the temporal expression which is obligatorily present in all cases. A crude approximation of what we have in mind may be represented diagrammatically as in fig. 3.

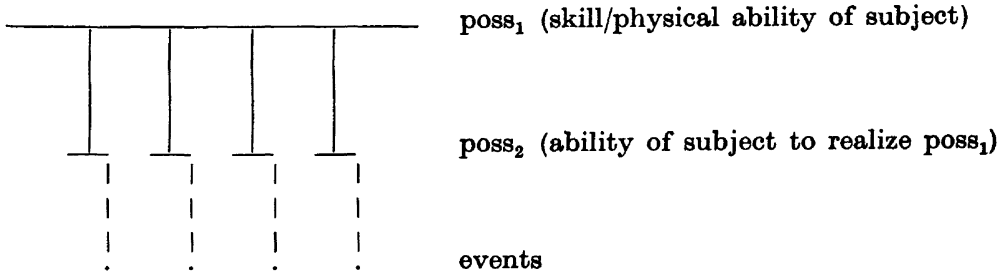

Figure 3: *Diagrammatic representation of the distinction 'possibility$_1$' versus 'possibility$_2$'*

The continuous horizontal line indicates the unbroken possession of the physical ability or the skill which is available for exploitation when the subject is in the right psychological state or the appropriate external preconditions exist (the dashes). When possibility$_2$ is present the event may occur, although not necessarily (whence the broken lines). We might compare possibility$_1$ to competence, possibility$_2$ to performance, but doubtless other analogies would do. One is reminded, for instance, of the distinction drawn by Aristotle (*Nichomachaean Ethics* 10926b, Loeb translation) between ἕξις disposition and ἐνέργεια 'the manifestation of a disposition in action'.

This distinction between what we have called 'possibility$_1$' and 'possibility$_2$' affords us a means of setting up a major dichotomy in the uses of μπορῶ. We have on the one hand those meanings which suggest some continuous, undistributed state, and those which refer rather to recurrent states.

It is obvious from the discussion above that the epistemic and deontic meanings of μπορῶ are in fact to be included among those which suggest some continuous, undistributed state. We prefer, however, not to connect our distinction poss$_1$/poss$_2$ with the epistemic and deontic uses of μπορῶ (i.e. to subsume them under possibility$_1$), and that for both syntactic and semantic reasons. Deontic or epistemic μπορῶ which suggest some continuous, uninterrupted state, have always wide scope, irrespective of whether a rate expression is present, while the other meanings of μπορῶ are normally interpreted as having narrow scope (i.e. as indicating poss$_2$) in conjunction with such expressions. Furthermore, in our discussion of the poss$_1$/poss$_2$ distinction we have assumed poss$_1$ to be subject-dependent (i.e. competence, ἕξις disposition), while epistemic and deontic μπορῶ seem to denote rather a possibility existing irrespective of any property or state characterizing the subject.

Clearly the recognition of the possibility$_1$/possibility$_2$ distinction does not in itself throw much light on the problems raised by examples (14) to (19). As we see, in both the skill (14) and physical ability (15) senses of μπορῶ, unless a rate expression is present the perfective is the preferred aspectual choice in the complement. However, if a rate expression is added (16, 17) either choice may be made, and the problem then is to explicate the native speaker's intuition that there is involved some kind of semantic distinction. There is also the matter of implicative uses of μπορῶ (i.e. those uses in which it corresponds to English 'manage'). Our primary aim is to

determine what relations, if any, link these various uses. Must we in the end rest content simply to list the various 'meanings' of *μπορῶ* and spell out the rules for aspectual choice case by case, as we might feel obliged to do if we were confronted with a case of accidental homophony, or do the syntactic peculiarities apparently associated with the various semantic nuances of the verb stem rather from general principles of logical form?

Let us consider first sentences (15), (16) and (17), which make reference to the subject's ability to lift 100 kilograms. What we must account for is the fact that the bare claim 'I can lift 100 kilograms' takes a perfective complement, while 'I can lift 100 kilograms three times a day' may be expressed in Greek with either aspectual choice.

In terms of the distinction we drew between 'possibility$_1$' (general skill, ability, disposition) and 'possibility$_2$' (appropriate preconditions for the exploitation of possibility$_1$) it would appear that while the general claim of (15) involves only possibility$_1$, the temporally specified (16) and (17) invite us to invoke the notion of possibility$_2$: that is, they appear to assert that the subject is in an appropriate physical or psychological state three times a day to realize his underlying prowess. As a first approximation we may suggest that the situation is somewhat as in fig. 3 above. There is a continuous disposition (correlated roughly to the possession of appropriate and suitably trained musculature) represented by a line, and in addition short stretches of whatever states constitute the necessary conditions for performance. When these conditions exist the subject may or may not lift 100 kilos, whence the dotted lines in fig. 1 leading from the occurrences of possibility$_2$ to the points representing the events. That is, neither (16) nor (17) are implicative. It is quite possible to add without contradiction to either of them 'but I never do it' *ἀλλὰ δὲν τὸ κάνω ποτὲ*. This is the first of the various logical relations which we shall find. Let us state it again (20).

(20) *μπορῶ νὰ σηκώνω/σηκώσω ἑκατὸ κιλὰ τρεῖς φορὲς τὴν ἡμέρα* ⫤ *σηκώνω ἑκατὸ κιλὰ τρεῖς φορὲς τὴν ἡμέρα* 'I can lift (impf./pf.) 100 kilograms three times a day' ⫤ 'I lift 100 kilograms three times a day.'

It is equally clear that both (16) and (17) imply (15). That is, if a person is able to lift 100 kilograms a day he is able to lift 100 kilograms tout court. This constitutes a second important relation (21).

(21) *μπορῶ νὰ σηκώνω/σηκώσω ἑκατὸ κιλὰ τρεῖς φορὲς τὴν ἡμέρα* ⊃ *μπορῶ νὰ σηκώσω ἑκατὸ κιλά* 'I can lift (impf./pf.) 100 kilograms three times a day' ⊃ 'I can lift (pf.) 100 kilograms.'

On the other hand the bald claim that I can lift 100 kilograms says nothing about the number of times per day I can do it, and indeed, if the reference is to a nonrepeatable feat of strength such as pulverizing a particular piano, while the simple claim might be true the addition of any rate expression would result in nonsense.

Leaving for the time being the problem of the perfective choice in simple claims such as the one made in (15) let us turn to the relation linking (16) and (17). While both translate into English as 'I can lift 100 kilograms three times a day' the first has a perfective, the second an imperfective complement verb. It is natural to ask first whether the difference is truth-functional and then, if it is, what implicational relation, if any, links the sentences. However, things are somewhat complicated by the fact that (17) (with the imperfective) might be appropriately uttered in at least three situational contexts.

(a) Perhaps the commonest context in which *μπορῶ νὰ σηκώνω ἑκατὸ κιλὰ τρεῖς φορὲς τὴν ἡμέρα* would be used in preference to the same sentence with perfective *σηκώσω* would be one in which the speaker wished to refer not to three completed acts (i.e. agent-controlled events) but rather to each act in the course of its development. This distinction stems from the use of the Greek imperfective to express continuity (as well as habit), in which case its function is analogous to that of the English progressive aspect. Although the English is quite heavily marked, a crude equivalent would be 'I can be lifting 100 kilograms three times a day'[4]). It should be noted that this particular employment of the imperfective aspect is quite unrelated to the rule whereby rate expressions impose this feature on the verb they qualify; that is, the complement verb may carry imperfective aspect even on the assumption that the rate expression qualifies the modal (as is unambiguously the case in (16)). It seems clear that if it is possible for a person to participate three times a day in one of the 'subevents' of the event of lifting 100 kilograms (to borrow the felicitous terminology of Woisetschlaeger 1977) it is possible for him to participate in the complete event three times a day. Conversely

[4]) One may compare the similar usage involving the strong modal *πρέπει* 'must', for which see Newton and Veloudis (1980).

in order to perform three times a day the complete action of lifting 100 kilograms he must perforce perform the various subactions. Thus on the 'continuous' reading of (17), it is truth-functionally equivalent to (16). This is not of course to claim that it is 'synonymous' as this term might conventionally be applied, any more than the English 'I visited China' is synonymous with the truth-functionally equivalent 'I have visited China'. There are different presuppositions involved and the linguistic and extralinguistic context will often impose a particular choice.

(b) In certain contexts (16) may differ from (17) in respect of the relative scope of the modal and rate expression. When this is the case there may very well be a truth-functional distinction. To make this clear, let us consider these same examples. If the aspectual variation reflects scope differences then the meanings may be represented as in (22) and (23).

(22) [I can [lift 100 kilograms]] three times a day.

(23) I can [[lift 100 kilograms] three times a day.]

In (22) the rate expression is associated with the modal and the sentence asserts that the proposition 'I can lift 100 kilograms' is true at three points in time during any given day. That is, if the sentence is true, at any one of those three particular times the subject is in a position to truly claim *μπορῶ νὰ σηκώσω ἑκατὸ κιλά* with the perfective *σηκώσω* used of the particular occasion he would be establishing at the moment of utterance. Much stronger than this is the claim made in (23). Not only is it asserted that on three different occasions during the day is the subject in a physical and mental state (possibility$_2$) to exploit his prowess (possibility$_1$) in order to lift 100 kilograms if he so wishes but that his prowess (possibility$_1$) enables him to perform the feat a total of three times a day. These are distinct claims. Imagine a weight-lifter who (a) was capable of lifting 100 kilograms at 9 a.m., 2 p.m. and 6 p.m. (say, immediately after the three main meals of the day) but at no other time and (b) who after lifting 100 kilograms entered a state of physical exhaustion which incapacitated him for 12 hours. Such a person could truly claim (16), while (17) would represent a downright lie.

On this present distinction between (16) and (17) the implicational relations are readily established. One who is able to (lift 100 kilograms three times a day) is necessarily able three times a

day to (lift 100 kilograms). That is, (17) implies (16), so that we have (24).

(24) *μπορῶ νὰ σηκώνω ἑκατὸ κιλὰ τρεῖς φορὲς τὴν ἡμέρα* ⊃ *μπορῶ νὰ σηκώσω ἑκατὸ κιλὰ τρεῖς φορὲς τὴν ἡμέρα* 'I can lift (impf.) 100 kilograms three times a day' ⊃ 'I can lift (pf.) 100 kilograms three times a day.'

Thus we have established that (a) if (17) is assigned a 'continuous' reading it is truth-functionally equivalent to (16) and (b) on a noncontinuous reading it is not truth-functionally equivalent to (16) but implies it unilaterally. How then are (17) on its two readings and (16) related to (15)? This is easily answered. Anyone who can truly claim either (16) or (17) can claim (15). If it is true of Jack that he can do something *n* times a day (on either scope interpretation) then it is true that he can do it (but obviously not conversely). We shall revert to the underlying logic later: in the meantime let us consider a third nuance capable of distinguishing (17) from (16).

(c) In certain contexts (17) may differ from (16) in having some degree of implicative force. That is *μπορῶ* + imperfective verb is sometimes more likely to be read as implying success than it is when its complement is perfective. The rationale of this may be illuminated by considering again (18) and (19). In (18) we have 'he was able (impf.) to come (pf.)' and in (19) 'he was able (pf.) to come (pf.)'. While (18) may readily be continued 'but he didn't', the addition of this to (19) would result in a contradiction.

In fact in all the examples we have studied the perfective forms of *μπορῶ* are synonymous with *καταφέρνω* 'I manage'. Why should this be so? One can only guess that the reason lies in the common observation that implicatives cannot be tensed independently of their complements. Thus we cannot say *μπόρεσε στὶς πέντε νὰ ἔρθει στὶς ἕξι* any more than we can say in English 'he managed at 5 to come at 6'. Because the aspect of verbs may be assumed to be in general determined by overt or covert temporal specifiers (although we cannot argue the point here), any temporal adverb which imposes a particular aspect on the verb it modifies in a main clause will have the same effect when the clause is embedded under *μπορῶ*; and if *μπορῶ* is used implicatively and therefore not open to independent temporal specification the same aspect will be selected for it as well. For example *στὶς ἕξι* belongs to that class of temporal expressions which select perfective (if we may ignore for the

moment the 'continuous' uses of imperfective as in 'he was coming at 6'). Thus 'he came at 6' is, with the perfective verb *ἦρθε*, *ἦρθε στὶς ἕξι*. Because in 'he managed to come at 6' the *στὶς ἕξι* must also specify the 'managed' we would expect *μπόρεσε*, perfective just like *ἦρθε*. As example (18) shows, the imperfective *μπόρεσε* with a perfective complement is not implicative. In fact the imperfective forms of *μπορῶ* are obligatorily used for all its senses other than the implicative one. All this leads us to expect that (a) when the complement is imperfective through association with a rate expression *μπορῶ* in the sense 'manage' will also be imperfective, and that (b) when *μπορῶ* is understood as meaning 'manage' and is in the imperfective, the complement will also be imperfective. It is found that for most speakers (a) is valid. That is, they will not accept as grammatical structures such as (25).

(25) **μπόρεσε νὰ ἔρχεται* 'He was able (pf.) to come (impf.).'

However, with regard to (b) the situation is far from clearcut. It would obviously be neater if we could claim not just that *μπορῶ* is implicative when it and its complement are both perfective, but that the same applies when both verbs are imperfective. However, this cannot be the case, for, as we have seen, a sentence such as (17) 'I can (impf.) lift (impf.) 100 kilograms three times a day' is subject to at least two interpretations neither of which is implicative (the 'continuous' and 'wide scope modal' ones). It follows that we cannot have a rule to the effect that *μπορῶ* (impf.) + complement verb (impf.) will invariably have an implicative interpretation; but the converse is worth examining. Is it the case that on an implicative interpretation the complement of an imperfective *μπορῶ* will be itself imperfective? Our evidence suggests that (a) this claim is too strong but that (b) in such contexts the imperfective is considerably more likely than the perfective. Consider (26).

(26a) *κάθε Κυριακὴ μπορῶ νὰ κοιμηθῶ τὸ μεσημέρι ἀλλὰ δὲν μ' ἀφήνει τὸ σκυλὶ τοῦ γείτονα* 'Every Sunday I can sleep (pf.) in the afternoon but the neighbour's dog won't let me.'

(26b) ?*κάθε Κυριακὴ μπορῶ νὰ κοιμᾶμαι τὸ μεσημέρι ἀλλὰ δὲν μ' ἀφήνει τὸ σκυλὶ τοῦ γείτονα* 'Every Sunday I can sleep (impf.) in the afternoon but the neighbour's dog won't let me.'

(26c) **κάθε Κυριακὴ μπορῶ καὶ κοιμᾶμαι τὸ μεσημέρι ἀλλὰ δὲν μ' ἀφήνει τὸ σκυλὶ τοῦ γείτονα* 'Every Sunday I can sleep (lit. can and sleep) in the afternoon, but the neighbour's dog won't let me.'

(26a), in which the matrix verb is in the imperfective present (traditionally labelled simply 'present') and the complement verb in the perfective, is completely grammatical. In (26c) there occurs a common alternative to *μπορῶ* + *νὰ* + complement verb which is unambiguously implicative: *μπορῶ* + *καὶ* + imperfective present. Thus 'he is able to play (pf.) the piano at noon' might be *μπορεῖ καὶ παίζει* (impf.) *τὸ μεσιμέρι*. Similarly, with modal and complement both in the perfective past we might have *μπόρεσα καὶ ἔφυγα* 'I was able (pf.) and I left (pf.)' instead of *μπόρεσα νὰ φύγω*. Because such paratactic constructions are unambiguously implicative a sentence such as (26c) involves rank self-contradiction. (26b) is at best marginal. We saw that in structures of implicative *μπορῶ* + complement verb there is aspectual concord where reference is to single completed actions (i.e. both verbs are then perfective), and this rule is categorical.

The doubtful status of sentences such as (26b) indicates that where habitual action is involved there is at least a strong tendency towards such aspectual concord. That is, 'I manage to do something every Sunday' is more likely to have an imperfective complement than 'I am able to do it but in fact don't'. The reason for the tendency is quite clear. 'Every Sunday (I manage to sleep)' implies 'I manage (to sleep every Sunday)' and it does not seem unnatural that the implication should influence the syntax of the assertion. Let us again note, though, that only the perfective forms of *μπορῶ* are univocally implicative. While imperfective *μπορῶ* imperfective complement is more likely to be interpreted to imply the realization of the complement than when the latter's verb is perfective, the reading depends largely on context. For example an adverb such as *εὐτυχῶς* 'fortunately' has a strong tendency to force an implicative interpretation; again a verb of successful achievement such as *καταλαβαίνω* 'I understand' suffices to invest a matrix *μπορῶ* with implicativity (*μπορῶ νὰ σὲ καταλάβω ἀλλὰ δὲν σὲ καταλαβαίνω* 'I can understand you but don't understand you' is odd).

Having now distinguished an implicative *μπορῶ* from its various nonimplicative senses, we may ask how it is related to them. Again the answer seems obvious. It implies all of them. That is, to use our example, 'I manage to lift 100 kilos three times a day' implies (a) 'I can (lift 100 kilos three times a day)', (b) '(I can lift 100 kilos) three times a day' and (c) 'I can lift 100 kilos'.

The sentences we have been dealing with thus far concern the physical ability/success meanings of *μπορῶ*. In its 'skill' meaning

μπορῶ has not been discussed and it has certain idiosyncrasies which distinguish it from the *μπορῶ* of physical ability; for instance we can always replace it by *ξέρω* 'I know' + imperfective complement (or *καὶ* 'and' + imperfective present): *μπορῶ νὰ παίξω πιάνο* = *ξέρω νὰ παίζω πιάνο* (or *ξέρω καὶ παίζω πιάνο*). However, in the respects which concern us here these do not appear to be essential differences (e.g. 'I can play the piano three times a day' implies 'I can play the piano').

3. In section 1 we discussed the epistemic and deontic uses of *μπορῶ* and concluded that both modality types are treated by the grammar of Modern Greek as continuous states; this is reflected in the fact that epistemic and deontic *μπορῶ* always have wide scope over rate expressions (e.g. 'you may come every day' can only be bracketed 'you may [come every day]', never as 'you may come [every day]'). We then turned to the physical ability/success meanings and found that certain implicational relations link the sentence types we examined. We now attempt to identify the apparent underlying pattern which emerges from the more or less disconnected accounts we gave these physical ability/success uses.

For convenience we list the five main sentence types examined above (27).

(27) i. *μπορῶ νὰ σηκώσω ἑκατὸ κιλά* 'I can lift (pf.) 100 kilograms.'
ii. *μπορῶ νὰ σηκώσω ἑκατὸ κιλὰ τρεῖς φορὲς τὴν ἡμέρα* '[I can lift (pf.) 100 kilograms] three times a day.'
iii. *μπορῶ νὰ σηκώνω ἑκατὸ κιλὰ τρεῖς φορὲς τὴν ἡμέρα* '[I can lift (impf.) 100 kilograms] three times a day' (continuous sense).
iv. *μπορῶ νὰ σηκώνω ἑκατὸ κιλὰ τρεῖς φορὲς τὴν ἡμέρα* 'I can [lift (impf.) 100 kilograms three times a day].'
v. *μπορῶ νὰ σηκώνω ἑκατὸ κιλὰ τρεῖς φορὲς τὴν ἡμέρα* '[I manage to lift 100 kilograms] three times a day.'

The entailment relations linking these five sentences were mentioned above and are summarized in figure 4.

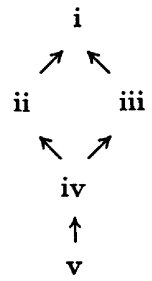

Fig. 4: *The entailment relations between sentences* (27i–v)

It is pleasing that the normal transitivity relation holds. That is, (v) implies (ii) and (iii) and also (i); and (iv) also implies (i). Let us look at our entailments from the point of view of the schematic logical form of the individual sentences.

Sentence (v) asserts nothing more than that the subject lifts 100 kilos three times a day; the addition of *μπορῶ* merely introduces the presuppositions that the feat involves some difficulty and that the subject makes voluntary attempts to achieve it. The rate expression 'three times a day' is representative of an enormous range of similar expressions; it would appear that in all cases we have basically what amounts to universal quantification over occasions. In this instance, taking t to stand for 'occasion' we have something like (28).

(28) Vt (t is a day $\supset$ I lift 100 kilograms 3times during t)

It does not in fact distort the presentation of the basic structures involved if we simply take 'Vt' to represent all rate expressions. Thus in this case if t ranges over periods of one day and p stands for 'I lift 100 kilograms n times' (v) reduces to simply (29).

(29) $Vt(p)$

It is an axiom of most forms of alethic logic (not deontic!) that $p \supset Mp$, i.e. that if p is the case then it is possible that p is the case. So that, substituting $Vt(p)$ for p, we have (30).

(30) $Vt(p) \supset M\,Vt(p)$

But $M\,Vt(p)$ on the interpretation we have given to t and p will mean exactly the same as (iv)! If I lift 100 kilos three times a day, then I have the ability to do this. Furthermore $M\,Vt(p)$ in most common systems of modal logic implies $Vt\,M\,(p)$ and this is equivalent to (ii) and (iii)! To make this clear let us consider how the expression $M\,Vt(p)$ is commonly understood. It states that there is at least one possible world in which p holds at all times t. If we label the real world w_0 and possible worlds w_1, w_2 . . . and all occasions t_1, t_2 . . . the statement is minimally satisfied in e.g. fig. 5, where in just one possible world p is true on all occasions.

	w_0	w_1	w_2	w_3	. . .
t_1			p		
t_2			p		
t_3			p		
.			.		
.			.		
.			.		

Fig. 5: *A situation minimally satisfying the statement* $M\,Vt(p)$

But it is obvious at a glance that if in one possible world (w_2 here) p is true at all times, then necessarily at all times there is one possible world in which p is true (i.e. at t_1 p is true in w_2, at t_2 p is true in w_2 . . .). It is equally clear that the converse does not necessarily hold. If p were true at t_1 in w_1, at t_2 in w_2, at t_3 in w_3 etc. it would be true that at all times there was a possible world in which p was true but not that there was a possible world in which p was true at all times. The statement $M\,Vt(p) \supset Vt\,M(p)$ cor-

responds to the implication observed earlier (24). That is, if it is true that [I can [[lift 100 kilos] three times a day]] it is necessarily true that [[I can [lift 100 kilos]] three times a day]. If my strength enables me to lift 100 kilos a total of three times on any one day then it must be true that on three occasions on any one day I have the strength to lift 100 kilos (but not conversely).

We noted earlier (see (21)) that sentence (i) is implied by (ii) and (iii); that is, if I can perform a particular act on n occasions per specified period then I can perform the act simpliciter. Furthermore we observed above in this section that both (iv) and (v) entail (i). The problem is to bring these observations under the rules of quantified modal logic.

It will be recalled that we have so far explained the sequence (v) $\supset$ (iv) $\supset$ (iii $\equiv$ ii) in terms of $Vt(p) \supset M\,Vt(p) \supset Vt\,M(p)$. What follows from $Vt\,M(p)$? The answer is that anything true at all times must be true at some time (assuming of course a nonempty universe of discourse). That is, $Vt\,M(p) \supset \exists t\,M(p)$. And to say that on at least one occasion there is one possible world in which p is true is the same as to say that there is one possible world in which on at least one occasion p is true, i.e. $M\,t(p)$. And in terms of the equations we have been making this would mean 'I can lift 100 kilos n times on at least one occasion.' We know that the precise value of n is irrelevant to the choice of aspect and that 'on at least one occasion' (*τουλάχιστο μιὰ φορὰ*) is a temporal specifier indicating a finite totality and selecting the perfective. Consider, for example, (31).

(31a) *ἦρθε τουλάχιστο μιὰ φορά* 'He came (pf.) at least once.'

31b) **ἐρχόταν τουλάχιστο μιὰ φορά* 'He came (impf.) at least once.'

Thus, the selection of the perfective aspect in sentences such as 'I can lift 100 kilos', far from being an accident, follows inevitably from the logical structuring of the modal system of Modern Greek. If this sentence follows from each and all of the other four it is because it represents a weaker claim, the claim that I can do something at least once. And any sentence expressing this will require a perfective complement. 'I can lift 100 kilograms' has the perfective form *σηκόσω* because 'I can lift 100 kilograms at least once' has it (*μπορῶ νὰ σηκώσω ἑκατὸ κιλὰ τουλάχιστο μιὰ φορά*).

For convenience we present the implicational chain of fig. 4 in terms of the underlying logical structures we have suggested for the five sentences. The truth-functionally equivalent (ii) and (iii) are combined.

(i)	$\exists t\,M(p) \equiv M\,\exists t(p)$
	$\uparrow$
(ii $\equiv$ iii)	$Vt\,M(p)$
	$\uparrow$
(iv)	$M\,Vt(p)$
	$\uparrow$
(v)	$Vt(p)$

Fig. 6: *The schematic logical forms of sentences* i–v *and their implicational relations*

In the light of the above discussion, let us consider once again the diagrammatic representation proposed earlier (fig. 3) for various types of *μπορῶ* structures. We observed that while the bare claim 'I can lift 100 kilos' refers to a permanent disposition to perform the feat specified (possibility$_1$), a rate expression such as 'three times a day' introduces the notion of such temporary states as provide the necessary conditions for the realization of possibility$_1$ (possibility$_2$). We have now attempted to show that (a) even in the case of the simple claim there is covert reference to 'on at least one occasion'; (b) (iii) may differ from (ii) in that the former refers to the individual acts as being in progress, so that instead of points, dashes would provide a better representation, (c) (ii) and (iii) on the one hand may be distinguished from (iv) in the same way as *Vt M* differs from *M Vt*, that is, in the relative scope of modal and rate expression; (d) (v) may be used implicatively. In view of this we might propose that the appropriate diagram be as in fig. 7.

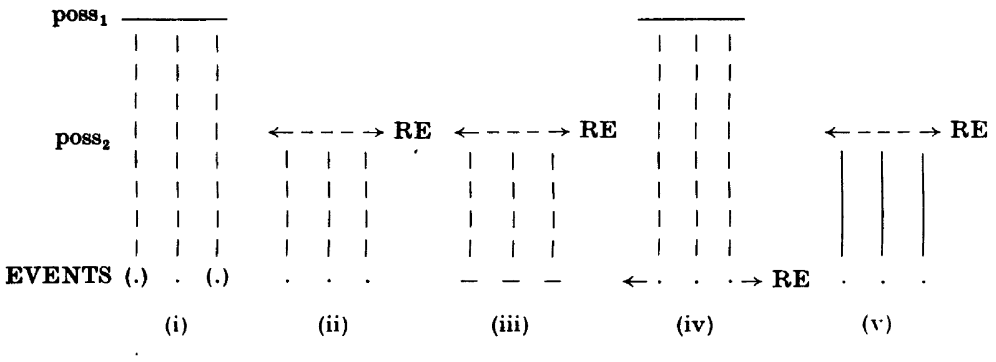

Fig. 7: *Possible diagrammatic representation of sentences* (i) *to* (v). *The arrows indicate indefinite extension in time, broken lines nonimplicativity;* RE = *'rate expression'*

4. The basic question which we have tried to answer in this paper is: are the rules linking the various meanings of the Greek modal *μπορῶ* to the aspectual selections made in its complement verbs idiosyncratic, implying that we are virtually dealing with a set of accidentally homophonous verbs (*μπορῶ*, ... *μπορῶ*), or is there a set of underlying principles which will enable us to posit one single modal where linguistic behaviour depends on the nature of the logical structures in which it is incorporated? The evidence we have presented will, we hope, convince the reader that the second alternative is the correct one. In order to provide logical forms rich enough to account for the facts, all we have to do is to posit the presence in underlying logical form of a variable *t* ranging over occasions, and the universal and existential quantifiers (plus

probably various nonconventional quantifiers for notions such as 'often', 'rarely'). By so doing we are able to show that the aspectual choices made by *μπορῶ* are entirely predictable, given the rule whereby rate expressions select imperfective aspect in the verb they qualify, and such expressions as indicate occurrences of finite cardinality, perfective aspect. The temporal expressions may be overt or covert, and in either case will enter into scope relations with the modal. Given these assumptions it may be shown that the rules governing the aspect of complement verbs embedded under the general Modern Greek expression of weak modality, *μπορῶ*, follow directly from the familiar entailment relations of simple sentences of temporally quantified modal logic.

The core of our discussion has concerned senses of *μπορῶ* which relate to physical ability and success, but the framework we establish is assumed to be of general applicability. Without wishing to argue the point here we would suggest that other senses may be explicated in terms of the same apparatus but that they will vary in the degree to which they utilize the range of underlying logical schemata included in fig. 6. A treatment of the sense 'favorable conditions' (as in our example at the beginning of section 1 *we can go out and play now that it's stopped raining*) would probably require the full set of schemata, while the 'skill' sense is incompatible with such schemata as represent rate expressions. And we discussed at some length the apparent principle that deontic and epistemic modality always impose a wide scope reading on *μπορῶ*. Finally the principles outlined do not appear to be language-specific; the Slavic languages, for example, would seem in general to make aspectual choices on the same sort of basis as Modern Greek, although details naturally differ. But a proper discussion with appropriate cross-linguistic comparisons is a project for the future.

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