



Detecting variable force in imperatives: A modalized minimal approach

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Abstract

This paper draws attention to various environments in Greek which show that imperatives convey possibility and not necessity as widely assumed in the literature. The interaction of imperatives with other operators reveals the presence of an existential operator. At the same time, however, it is shown that imperatives cannot be analysed as invariably conveying possibility. Instead, I suggest an analysis in which imperative verbal mood is semantically contentful, triggering a presupposition that results in a domain restriction for the set of evaluation worlds. Combining insights from both the modal (Schwager 2006; Kaufmann 2012) and the minimal approach (Portner 2004, 2007), I show that we can have a modalized minimal analysis if we take imperative verbal mood to be contentful at a presuppositional level. This twist allows us to capture the variable quantificational force of imperatives depending on the environment they appear in.

Keywords Imperatives · Verbal mood · Modality · Comparative possibility · Scope · *Only* · *Even* · Free Choice Items

1 Introduction

It is well-known that in many languages imperatives can vary in their contextual interpretation (Wilson and Sperber 1988; Han 2000; Schwager 2006; Portner 2007; Grosz 2011; Condoravdi and Lauer 2012; Kaufmann 2012; von Stechow and Iatridou 2017). To mention only some of the readings, the imperative in (1), depending on the context, can express *command*, *plea*, *advice*, *permission*, *indifference* as in (1a–e).

- (1) Sign this paper.
 - a. As a *command/request* from the chief to the employee.
 - b. As a *plea* from a child to her mother to sign a form which provides permission for school trips.

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- c. As *advice* to somebody who wonders how to apply for daycare.
- d. As *permission*, although the speaker might not fully agree (... *but you should know I don't agree*).
- e. As *indifference*, requiring a continuation like ... *burn this paper, eat this paper... I don't really care...*

As I discuss in the following section, under most analyses the *basic* interpretation for imperatives is considered to be the strong one (*command, request, strong advice*) whereas the weak is derived via some additional mechanism. In this work, I draw evidence mostly from the behavior of imperatives in Greek and argue that the weak interpretation (*acquiescence* in von Stechow and Iatridou's 2017 terms) is *basic* and that the stronger one is derived as an implicature. A variety of diagnostics provide evidence that the existential character of imperatives is much more pervasive than previously thought. First, I present scope ambiguities with the focus particle *mono* 'only' and the scalar particle *akomi ke* 'even' in Greek. Moreover, I discuss the distribution of Free Choice Items in imperatives showing that an all-universal analysis cannot straightforwardly account for all the data. These data indicate that imperatives, despite their apparent "imperative" character, can be best analysed as expressing possibility. However, as I show it is problematic to consider possibility as an integral part of the semantics of imperatives because, when imperatives combine with an overt adverbial modal in Greek, they acquire the force of the adverbial. This variability in force indicates that the imperative form does not involve an operator with fixed quantificational force.

In order to capture this flexibility in the interpretation of imperatives, I argue that the imperative consists of a *mood*-phrase taking as its argument a proposition (a function from worlds to truth values) with an imperative feature (+IMP). The imperative feature is critical since it introduces certain presupposition restrictions on the world variable, in particular the world variable is restricted to worlds consistent with the speaker's desires, thus resulting in a bouletic modal interpretation. By stripping the imperative form from the modal operator, the variability in the quantificational force of imperatives can be explained in a more flexible manner. If an imperative is embedded under a quantificational adverbial it acquires its force whereas in the absence of a quantificational operator existential closure applies, deriving a possibility modal interpretation.

While the analysis is designated to account for the facts presented for Greek imperatives, it can be extended to other languages in which imperatives are observed to have variable quantificational force, i.e. allow a variety of acquiescence readings in addition to the strong interpretation. Not all arguments can be extended to other languages. In Sect. 3.1.2 data from Hungarian and Serbian are discussed, replicating the scope ambiguities with *only* in Greek. In Sect. 3.2 an independent argument from Francis (2019) from the interaction of *even* with English imperatives is presented, suggesting that a weak existential analysis is extendable to English. A separate question concerns whether the strengthening mechanism suggested in Sect. 6 has to be the same across different languages. I will not get into this discussion as the language discussed is Greek, and strengthening is associated with certain prosodic patterns in Greek.

The paper proceeds as follows: in Sect. 2, I provide some background regarding previous approaches to imperatives focusing on their account for the observed polysemy. In Sect. 3, I present primary evidence mainly from Greek showing that the *existential* force is more prevalent than previously thought. In Sect. 4 I discuss imperatives which involve an overt adverbial showing that an all-existential analysis cannot account for the available combinations. In Sect. 5, I suggest that we can account for the entire range of data by treating the imperative as a mood-Phrase with a special imperative feature. In Sect. 6, I refer back to plain imperatives which can express command or request. I show that these cases can be best analysed as implicatures derived by exhaustification over focus alternatives. Section 7 concludes and puts forward new questions raised by the proposed analysis.

2 Previous approaches and their perspective towards polysemy

In this section, I present two distinct approaches, under which imperatives convey a strong interpretation. I follow a coarse dichotomy between the so-called minimal approach according to which there is no operator in the semantics, and the modal approach which argues in favor of a modal operator in the semantics (see Iatridou 2008; von Stechow and Iatridou 2017). This discussion will help us test the predictions that these theories make in view of the data presented in Sect. 3 and compare them with the proposed analysis in Sect. 5.

2.1 Minimal approach

The essence of a minimal approach to imperatives is that there is no operator in the semantics of an imperative clause (Hausser 1980; Portner 2004, 2007; Mastop 2005; Pak et al. 2008; Starr 2011; von Stechow and Iatridou 2017; Roberts 2018). The “directive” force of imperatives comes from the pragmatics. The difficulty is to define the exact mechanism that is responsible for turning a property or a proposition into a “directive.” Here I focus on Portner’s (2004, 2007) approach (but see also Starr 2011; von Stechow and Iatridou 2017).

Portner (2004, 2007) suggests that the imperative is a different clause type along with declaratives and interrogatives. Following the Stalnakerian notion of Common Ground (CG), declaratives serve as updates of the information in the CG. Portner suggests a parallel function for imperatives; imperatives add properties to another stack dubbed To-Do-List for each addressee (cf. update of the plan set in Han 2000). The denotation of the imperative is just a property which holds of the addressee (A), as shown in (2) for an imperative clause like *Open the window*.

- (2) Imperative is a property restricted to A:
 $\llbracket \text{Open the window} \rrbracket = \lambda w. \lambda x: x = A. x \text{ opens the wnd in } w$

Similarly to the way in which a declarative proposition adds its content to the Common Ground (CG), and an interrogative to the Question Stack (Q), a successfully uttered imperative adds its content to A’s To-Do-list (T). In Portner (2007), this is formalized as in (3):

(3) Pragmatic Function of Imperatives

- a. The To-Do-list function T assigns to each participant α in the conversation a set of properties $T(\alpha)$
- b. The canonical discourse function of an imperative clause ϕ_{imp} is to add $[[\phi_{imp}]]$ to $T(\text{addressee})$. Where C is a context of the form $\langle CG, Q, T \rangle$:

$$C + \phi_{imp} = \{ [CG, Q, T(\text{addressee})] \cup \{ [[\phi_{imp}]] \} \}$$

The Agent's commitment principle guarantees that the addressee will try to fulfill as many properties as (s)he can from his To-Do-List. In addition, the To-Do-list imposes an ordering on the worlds compatible with the CG. Portner (2007) makes a direct comparison between what he calls *priority* modals and imperatives. In a similar fashion that the conversational backgrounds restrict the interpretation of the ordering source in modals, imperatives depend on conversational backgrounds in the context to get their bouletic, deontic or teleological flavor. In this sense, we can think of sub-To-Do Lists for each individual (e.g. a bouletic To-Do List, a deontic To-Do List, etc.). Although such an analysis accounts for the different imperative meanings such as *advice* vs. *command*, as Portner himself acknowledges *permission* readings cannot be derived. Portner (2010) suggests that permission readings arise from conflicting requirements on the To-Do List. Building on the general idea that permissions arise "in the context of a countervailing prohibition" (Kamp 1979), Portner argues that the context in which an imperative is interpreted as a permission typically contains a prohibition. For example, suppose that A's To-Do List before the speaker utters the imperative *eat a banana* involves a property, $\neg \text{eat a banana}$. After the update, A's To-Do List involves two conflicting properties: *eat a banana* and $\neg \text{eat a banana}$. This means that the updated To-Do List is inconsistent and therefore offers a choice to eat or not eat a banana.

However, as von Fintel and Iatridou (2017) discuss, there is an empirical issue with this analysis. In many cases conflicting requirements do not suggest that there is a possibility of choosing among them. Likewise, Portner (2010) acknowledges a similar problem in the following example:

(4) Bring beer to the party tomorrow! Actually, bring wine!

The imperatives in (4) are inconsistent but they do not provide a real choice to the addressee as to whether he brings wine or beer. Portner suggests that in order to induce a choice among conflicting requirements the imperative has to be marked as being permission. In other words the default is that imperatives are interpreted as requirements, yet in some cases imperatives can be marked (by intonation, or by an overt expression like *if you want*, or by a morpheme in some languages) as permissions.

As von Fintel and Iatridou (2017) argue, this idea is not without problems as by introducing an additional requirement/permission feature, the approach largely loses its advantage over analyses that assume a covert operator. A potential amendment, suggested by von Fintel and Iatridou (2017), is that the property is not added automatically to A's To-Do List but rather "it is put on the table as a possible addition to A's To-Do List" (see also Condoravdi and Lauer 2012 on this point). Under this view, the level of endorsement can vary in different contexts. The default case is that speakers fully endorse what they say. However, as they discuss, even in declaratives,

the speaker can indicate by rising intonation or a cleft, that (s)he is not entirely sure whether the information (s)he provides is true (cf. Farkas and Bruce 2010; Malamud and Stephenson 2014). Similarly, von Stechow and Iatridou's (2017) suggestion is that imperatives can express lower endorsement via a rising intonation, or by clearly stating that the speaker has no preference (e.g. *I don't care.*) Portner (2018a) proposes a similar distinction between rising and falling imperatives building on Gunlogson's (2004) analysis of declaratives, suggesting that permission associates with rising intonation. However, all the cases of permission imperatives discussed in this paper are most naturally uttered with falling intonation. Also, Appendix B presents a perception study of imperatives in Greek with a falling boundary tone which can be perceived as permission. Similar data are reported for English by Oikonomou (2016). Although, rising intonation can favor a permission reading, especially in the case of providing advice, it is not a necessary nor a sufficient condition for the emergence of weak readings of imperatives.

2.2 Modal approach

The common thread in the modal analyses of imperatives is that they incorporate a modal operator into the semantics of an imperative clause (Schwager 2006; Crnić and Trinh 2009; Grosz 2011; Condoravdi and Lauer 2012; Kaufmann 2012; Keshet 2012; Keshet and Medeiros 2019).¹ The exact character of this operator differs across the different approaches. Here we focus on Kaufmann's (2012) approach on which the present analysis largely builds.

Kaufmann, in her dissertation (Schwager 2006) and later in Kaufmann (2012), analyses the imperative operator as a universal modal. Under this approach the meaning of the imperative is identical to that of a universal modal as shown in (5):

- (5) \forall -Modal approach:
 $[[\text{Open the window!}]]^w = \forall w' \in \cap f(w)$ [A opens the window in w']

The fact that there is a modal operator in the semantics allows Kaufmann to use the machinery introduced by Kratzer (1981) in order to account for the variety of interpretations in imperatives. Roughly, by employing different conversational backgrounds for the ordering source, Kaufmann derives *wishes* ($g = \text{what the speaker wants}$), *requests/commands* ($g = \text{what the speaker orders}$) and *advice* ($g = A$'s preferences, or what is considered to be generally preferred) (see Kaufmann 2012, Sect. 4.1). However, *permission* and *acquiescence* readings once more present a puzzle because it is not a matter of a variable ordering source but of weaker force. Among the various types of acquiescence readings, Kaufmann (2012) considers *For-example-advice* as in (6), the most challenging for a universal analysis.

- (6) Stop buying cigarettes, for example! *For-example-Advice*

¹Han (1998) proposes that there is an imperative operator at C^0 with a "directive" and "irrealis" feature that provides imperatives with their directive force. Han's (1998) analysis is not minimal in the sense that it involves an illocutionary imperative operator. In the same sense, it is not a modal analysis because the operator does not function as a *run-of-the-mill* modal. In this respect, Portner's (2004) account shares many insights with Han's (1998) analysis. However, strictly speaking, Han (1998) does not reject the presence of an operator in the semantics. See also the discussion in Iatridou (2008).

Examples like (6) as an answer to the question “How could I save money?” clearly convey possibility and not necessity. For these cases, Kaufmann suggests that the universal modal should be reduced to an existential one. The mechanism she suggests is of particular interest for the present analysis because it is a weakening mechanism mirroring the strengthening mechanism proposed in Sect. 6.

In a series of works (Schwager 2005, 2006; Kaufmann 2012), Kaufmann develops an analysis of examples like (6) as inexhaustive possibilities. This means that the default imperative is analysed as an instance of exhaustive possibility. A possibility is exhaustive if it is the only possibility (e.g. *The only thing you can do to stop smoking is stop buying cigarettes*; Kaufmann 2012: 181–183).

Building on Zimmermann (2000), Kaufmann shows that an exhaustive possibility amounts to a necessity. Under this idea, an imperative is treated as a possibility which is obligatorily exhaustified thus being equivalent to a necessity. Kaufmann (2012) assumes that a covert EXH-operator combined with a possibility modal operator, constitute together the imperative operator. Under this view, when we get a possibility reading there is some mechanism which removes the covert EXH-operator. Kaufmann (2012) takes expressions like *for-example* to act as anti-exhaustifiers, removing the EXH-operator and licensing a possibility reading. As Kaufmann herself points out, the nature of this exhaustive operator as well as the conditions under which anti-exhaustification occurs require further investigation. Moreover, this analysis raises the question why imperatives should always combine with an EXH-operator.

The idea I pursue here is, in fact, very similar to Kaufmann’s idea of exhaustified possibilities. The difference is that I take exhaustification to be the direct result of an implicature generation mechanism in the presence of alternatives. Under this view, exhaustification will apply when there are certain alternatives which depend on focus marking.

Before closing this section, I will briefly introduce Condoravdi and Lauer’s (2012) approach to imperatives as *Effective Preferences*, as it differs both from the minimal and the modal approach in that it takes imperatives to always express *preferences*. The *speaker-bouletic* nature of imperatives is a basic characteristic that the present analysis shares with Condoravdi and Lauer’s (2012) proposal.

2.3 Condoravdi and Lauer (2012)

Condoravdi and Lauer (2012) analyse imperatives as preferential attitudes. The general idea is that imperatives express a speaker’s preference ordered with respect to other preferences. Under this view every individual has a set of desires, moral codes, obligations, which can be ranked with respect to their importance. Condoravdi and Lauer (2012) define this as a preference structure:

- (7) A *preference structure* relative to an information state W is a pair $\langle P, \leq \rangle$ where $P \subseteq \wp(W)$ and \leq is a partial order on P .

Whereas a preference structure can consist of contradictory preferences, the moment an agent has to act he needs to resolve these conflicts. In other words, he needs to make his preference structure consistent. A consistent preference structure is called an effective preference structure. In this model, an imperative sentence expresses the

speaker's *Effective Preference* at time t (= utterance time). An *Effective Preference* is the preference which is ranked higher than the other preferences in a consistent preference structure. Therefore, an imperative such as *Open the window* is interpreted as in (8), in which $PEP_w(Sp, p)$ means that the speaker in c (Sp) is publicly committed at w to act as though p is a maximal element of Sp 's effective preference, i.e. the Sp is committed to the *Effective Preference* that the addressee in c (A) opens the window in u .

$$(8) \quad \llbracket \text{Open the window} \rrbracket^c = \lambda w. [PEP_w(Sp, \lambda u [A \text{ opens the wnd in } u])]$$

From this meaning a number of things follow regarding the addressee's commitment to act as if he has the same effective preference as the speaker. However, treating imperatives as conveying ranked preferences also makes it difficult to account for cases in which imperatives express possibility.

All the analyses I have presented thus far, despite their notable differences, share a common characteristic; they all suggest a *strong* meaning for imperatives. In the following section, I show that a strong meaning cannot account for a range of environments which I take as evidence for the presence of a weaker operator in the semantics of imperatives.

3 Evidence for the existential character of imperatives

This section focuses on three data points from Greek illustrating the existential nature of imperatives. First, I show that imperatives interact with the particle *mono* 'only' in a similar way to existential modals and not like necessity modals. Thus, I take this as evidence against an underlying universal operator in imperatives. Second, I discuss the interaction of the scalar additive particle *akomi ke* 'even' with imperatives, showing that its interpretation can only be accounted if there is an underlying existential operator. These two environments also provide evidence for the existence of an operator in the semantics of imperatives against the minimal approach. The third argument involves the licensing of Free Choice Items (FCIs). These data converge to an existential analysis of imperatives which, in turn, raises new questions.

3.1 Only and imperatives

Haida and Repp (2012) show that an imperative containing *only* is ambiguous. The dialogue in (9), facilitates the reading that *it's OK to not paint the other tables* whereas in (10) the most favored reading is that *it's OK to paint the round table but it's not OK to paint the other tables*. From now on I will refer to the reading in (9) as *permissive* and to the reading in (10) as *prohibitive*.

- | | |
|--|--|
| <p>(9) A: You've asked me to paint those tables but I'm really tired and don't feel like doing something really useful today.
B: Only paint the round table.</p> | <p>(10) A: Oh, I feel like doing something really useful today. I think I'll paint the tables over there.
B: Only paint the round table.</p> |
|--|--|

(Haida and Repp 2012: 308)

I argue that the ambiguity in (9–10) is best explained as a scopal ambiguity. Evidence for this comes from Greek, where overt focus movement is shown to resolve scope ambiguities. Building on the Greek data with movement, I argue that the ambiguity can be best explained if we treat the imperative modal operator as an existential modal.

3.1.1 Evidence from overt movement in Greek

In Greek, the *only*-phrase can appear either in situ as in (11a) or fronted as in (11b). Fronting of the *only*-phrase resolves the scope ambiguity, in a way that it can only have a prohibitive interpretation, licensed as a response in (10, A). In what follows, I show that, when there is fronting, the imperative patterns with sentences involving an overt existential modal and not an overt necessity modal.

- (11) a. Vapse [mono to strogilo trapezi].
 paint only the round table
 b. [Mono to strogilo trapezi] vapse.
 only the round table paint

First I show that focus movement of the *only*-phrase above an overt modal operator in Greek, resolves the scope ambiguity, leading to a wide-scope interpretation of *only* (for a general discussion of focus movement in Greek see Tsimpli 1995; Baltazani 2002; Gryllia 2009).² I present scope resolution with an existential and a universal modal and I show that imperatives pattern with the existential modal rather than with the universal modal. I conclude that the underlying operator in this case should be an existential and not a universal.

Consider first the interaction of *only* with the overt existential modal in Greek. When *only* appears with its associate in-situ (12a), the sentence is ambiguous and, therefore, it is felicitous in both dialogues. When the *only*-phrase is preverbal (12b) only the wide scope (*only* > *can*) survives and therefore the sentence is good only in the dialogue in (10). (12b) has a prohibitive interpretation, i.e. it can only mean that *the only table that A is allowed to paint is the round one* (i.e. it's not OK to paint the other tables).

- (12) a. Boris na vapsis [mono to strogilo trapezi].
 can.2SG SUBJ paint.2SG only the round table
 ‘You can paint only the round table.’
 → OK in (9): $\diamond > \textit{only}$
 → OK in (10): *only* > \diamond
 b. [Mono to strogilo trapezi] boris na vapsis.
 only the round table can.2SG SUBJ paint.2SG

²Scope resolution under focus movement of the associate DP seems to be a general phenomenon in the case of focus operators like *only* in modal sentences. By contrast, contrastive topic movement does not have the same effect. For a discussion of focus movement and scope effects crosslinguistically see Erlewine (2014). See Crnič (2013) for independent evidence for the availability of inverse scope of *only* with modals.

‘The only table you can paint is the round one.’

→ Bad in (9): * \diamond > *only*

→ OK in (10): *only* > \diamond

The same scope pattern is observed with the universal modal *hriazete* ‘need.’ When the *only*-phrase is in-situ as in (13a), both interpretations are available whereas when the *only*-phrase moves in front of the modal as in (13b) the most favored interpretation is that *it is only the round table that is required to be painted*. Notice that (13b) does not fit as a response to A’s sentence in (10) as it presupposes that the round table needs to be painted, which does not seem to be derived from what A says. (13b) would be a better response to A’s sentence in (9) suggesting a compromising solution.³

(13) a. *Hriazete na vapsis* [mono to strogilo trapezi].

need.3SG SUBJ paint.2SG *only* the round table

→ OK in (9): *only* > \square

→ OK in (10): \square > *only*

‘You need to paint only the round table.’

b. [Mono to strogilo trapezi] *hriazete na vapsis*.

only the round table need.3SG SUBJ paint.2SG

‘The only table you need to paint is the round one.’

→ OK in (9): *only* > \square

→ Bad in (10): * \square > *only*

Crucially, the imperative operator interacts with *only* in the exact same way that an existential modal does. In (14a), when the *only*-DP remains in situ, both the narrow-scope (*imp* > *only*) and the wide-scope (*only* > *imp*) reading is available. This is shown by the fact that (14a), just like its English counterpart, is good under both dialogues in (9–10). On the contrary, (14b), in which the *only*-DP undergoes focus movement, is felicitous only in (10) yielding a prohibitive interpretation that *A is not allowed to paint the other tables*. This indicates that the underlying operator in imperatives is a possibility and not a necessity modal.

(14) a. *Vapse* [mono to strogilo trapezi].

paint *only* the round table

→ OK in (9): *A is allowed to not paint the other tables*.

→ OK in (10): *It’s only the round table that the A is allowed to paint*.

b. [Mono to strogilo trapezi] *vapse*.

only the round table paint

→ Bad in (9): **A is allowed to not paint the other tables*.

→ OK in (10): *It’s only the round table that the A is allowed to paint*.

³A reviewer suggests that using a different necessity modal like *prepi* ‘must’ does not yield the same contrast as in (13). This is indeed true for *prepi*. As the reviewer notices *prepi* is argued to be a Positive Polarity Item (PPI) in Iatridou and Zeijlstra (2013). This affects also its interaction with *only*. While Iatridou and Zeijlstra (2013) suggest that *prepi* ‘must’ can be interpreted in the scope of *mono* ‘only,’ there is a clear preference compared to *hriazete* to be interpreted above *mono* even with focus fronting. The same intuition I have for the weak necessity modal *tha prepe* ‘should’ which is reported to be a strong PPI thus not being interpretable in the scope of *only*. In any case, given the observed PPI-properties of *prepi*, I have avoided using it in the discussion of scope facts.

The data in (14) requires a bit more discussion. One reviewer points out that the facts with an imperative are not as clear as with the case of an overt modal. In particular the reviewer reports two groups of speakers, one group which indeed does not accept (14b) in a permissive context (e.g., (9)) as shown above, and one group which accepts (14b) even in a permissive context. In order to further investigate this hypothesis, I piloted a small study, in which speakers had to rate how natural they find the two variants (in a scale from 0 to 100) in a prohibitive and a permissive context. In addition, I elicited qualitative judgments from 6 native speakers (2 linguists and 4 non-linguists). 27 native speakers participated in the on-line study, and were shown four pairs of imperatives (with fronted and in-situ *only*) in a prohibitive context and six pairs of imperatives in a permissive context. Overall, sentences with a fronted *only*-phrase received a lower rating. Crucially, however, the mean naturalness rating was lower in the permissive (56.69%) than in the prohibitive context (82.37%) (see Appendix A). The fact that the speakers, in permissive contexts, rate the sentence with the fronted-*only* with an average 56.69% on the naturalness scale, shows, on the one hand, that they do not consider it very natural, but on the other hand, they do not evaluate the sentence as entirely unnatural in a permissive context. The responses from the qualitative study with 6 speakers shows that an imperative with fronted *only* becomes more acceptable in a context such as (9), if the person who utters the imperative sympathizes or accepts the objections of the addressee and prohibits them from doing more than they are willing to do. Thus, one possibility is that for some speakers the sentence retains its prohibitive meaning, as predicted by the current analysis, due to the speaker's willingness to adopt the point of view of the addressee. This view is consistent with the observation by an anonymous reviewer, that these sentences become much better once we add the adverbial *tote* 'then' as in (15).

- (15) [mono to strogilo trapezi] vapse tote.
 only the round table paint then

Tote 'then' refers to the objections raised by the addressee and signals that the speaker is willing to update his priorities given the new evidence. In this particular case, the speaker acknowledges the addressee's difficult situation, and therefore only allows him to paint the round table. i.e. the sentence still induces a prohibition against painting the other tables. This function of *tote* 'then' becomes even more obvious in examples like the following in which the addressee explains that (s)he has a health issue. (16a) is quite natural with the interpretation that, given the addressee's situation, the speaker does not allow him/her to carry more boxes. I find (16b) less plausible. However I can see how speakers can accommodate a covert *tote* 'then' and accept it in the given context.

- (16) A. We need to carry these boxes today.
 B. Oh I have a terrible back-pain today...
 a. A. Mono to mikro kuti kuvalise tote.
 Only the small box carry.IMP then
 'Only the small box carry then!' ~ It's not OK to carry the others.
 b. A. ?Mono to mikro kuti kuvalise.
 Only the small box carry.IMP
 'Only the small box carry then!' ~ It's not OK to carry the others.

An additional possibility, given the variation observed among participants (see the discussion in Appendix A), is that for some speakers there is no effect depending on the position of the *only*-phrase. This type of participant variation for scope judgements is a well attested phenomenon (see Oikonomou et al. 2020). Overall, based on the data presented in Appendix A and the qualitative judgements from native speakers we can say that when there is an effect of movement it goes in the direction expected by the current analysis. For the variation observed we need to further test the role of prosody among other factors.

Finally, a reviewer also suggests that the sentences with fronted *only* can improve in the given *permissive* contexts if a different particle like *tulahiston* ‘at least’ or *esto* (concessive ‘even’) is added (for the *at least*-interpretation of *esto* in Greek see Gianakidou 2007). As the reviewer points out these particles clearly indicate a permissive context and, unlike *tote* ‘then’, they cannot be used to express prohibition. In order to test whether these particles are acceptable with the fronted *only* in permissive contexts I included three examples in the on-line study, two involving *tulahiston* and one with *esto*. In all of these cases the speakers rated the sentences with less than 50% in the naturalness scale which suggests that these particles are not consistent with a fronted *only*. For example, an imperative with fronted *only* and *tulahiston* ‘at least’ as in (17b) received mean rating 44.03% while the corresponding sentence with the in-situ *only* received mean rating 87.48% on a scale from 0 (=entirely unnatural) to 100 (=entirely natural).

- (17) a. Anikse mono to parathiro tis kuzinas tulahiston.
 open only the window the.GEN kitchen.GEN at-least.
 ‘Open only the window of the kitchen at least.’
- b. Mono to parathiro tis kuzinas anikse tulahiston.
 only the window the.GEN kitchen.GEN open.IMP at-least.
 ‘Only the window of the kitchen open at least.’

The details of the study are discussed in Appendix A. While the results are to be interpreted cautiously, they do indicate that there is indeed a contrast between fronted and non-fronted *only* in permissive and prohibitive contexts. In addition, they suggest that, when there is an adverbial ensuring a permissive interpretation, the contrast becomes even stronger. While more research is necessary to corroborate the abovementioned observation that fronting in *only*-sentences resolves scope ambiguity, some speaker variation is to be expected as it is usually the case with scope judgements in general.

It is worth noticing that the scope ambiguity is not specific to the interaction with *only*, it is also attested with degree quantifiers such as *few*, *fewer than*.⁴ (18a) in which *few* surfaces in-situ is felicitous in both Contexts A and B, whereas (18b), in which *few* has undergone overt movement, is only compatible with Context B. When *few* is interpreted below *imp*, the interpretation is that *A is allowed to paint few tables (and it is OK to not paint all of them)* whereas when *few* takes wide scope the interpretation is that *there are few tables that A is allowed to paint (the rest of them he is not allowed to paint)*:

⁴Thanks to a SALT reviewer and to Irene Heim for pointing out the relevance of these data.

- (18) a. Vapse liga trapezia!
 paint few tables
 → OK in Context A: $\diamond > \textit{only}$
 → OK in Context B: $\textit{only} > \diamond$
- b. Liga trapezia vapse!
 few tables paint
 → Bad in Context A: $*\diamond > \textit{few}$
 → OK in Context B: $\textit{few} > \diamond$

Before presenting how we can derive the scope ambiguity, I present in the next section data from Hungarian and Serbian which exhibit the same pattern.

3.1.2 Scope facts in imperatives cross-linguistically

As a reviewer points out, one question is whether the scope facts with *only* can be replicated in other languages. In order to test this, it is necessary to look into languages which have overt focus movement with the particle *only* and additionally an imperative form which can have acquiescence interpretation. I was able to elicit data from three such languages, Bulgarian, Hungarian and Serbian.⁵ In all of these languages the imperative can have acquiescence interpretations providing permission or weak advice. In particular the plain imperatives in (19) can be uttered as permission, weak advice or as a command, strong advice:

- (19) a. Egyél almá-t. Hungarian
 eat.SUBJ.2SG apple-ACC
- b. Pojedi jabuku. Serbian
 eat.IMP apple-ACC
- c. Izjaž jabǎlkata. Bulgarian
 eat.IMP apple-ACC
 ‘Eat the apple.’

For the interaction of *only* with the imperative, the speakers in Hungarian (p.c. Éva Dékány) and Serbian (p.c. Ivona Ilić) reported the same pattern that I discuss for Greek in the previous section. The situation in Bulgarian seems to be less straightforward. One of the two speakers I consulted takes the effect of fronting with the overt modal but not with the imperative and for the other speaker fronting does not affect scope in either of the two cases. First, I present the facts for Hungarian and Serbian and then I discuss the Bulgarian data.

In both Hungarian and Serbian it is replicated that when the *only*-phrase moves above an overt possibility modal a prohibitive interpretation is derived for the relevant alternatives. This is shown in (21a) for Hungarian and in (21b) for Serbian. The sentence with the *only*-phrase in situ is consistent with an interpretation in which

⁵I am extremely grateful to Éva Dékány (for the Hungarian data), to Ivona Ilić (for the Serbian data) and to Snežana Iovtcheva and Roumi Pancheva (for the Bulgarian data) for providing the examples and discussing the data with me.

permission is provided to eat the apple and not eat other stuff. For example, the in-situ sentences in (20a) and (20b) are good in a context in which *a child doesn't like fruits, but his mom wants him to eat fruits, and in the end she compromises and says OK, "you can eat only the apple."* By contrast, the sentences with the fronted *only*-phrase in (21a–21b) are good only as prohibiting the alternatives, thus they cannot be uttered in the previous context. Instead, a context in which *Mama is preparing a tart, and the child sees the fruits in the plate and he says "oooo I'll eat the fruits!"* makes the sentences with fronted *only* felicitous.

(20) Permissive Interpretation:

- a. E-het-sz csak almá-t. Hungarian
 eat-possible-2SG only apple-ACC
 'It is possible for you to eat only apple.'
- b. Možeš da jedeš samo jabuku. Serbian
 can.PRS.2SG da eat.PRS.2SG only apple.ACC
 'You can eat only the apple.'

(21) Prohibitive Interpretation: \leadsto *You are not allowed to eat other stuff.*

- a. Csak almá-t e-het-sz. Hungarian
 only apple-ACC eat-possible-2SG
 'Only the apple it is possible that you eat.'
- b. Samo jabuku možeš da jedeš. Serbian
 only apple.ACC can.PRS.2SG da eat.PRS.2SG
 'Only the apple you can eat.'

In Hungarian and Serbian, the speakers report the same behavior for imperatives. The fronted *only*-phrase is licensed only in prohibitive contexts as the one with the tart, while the in-situ *only* can have a permissive interpretation:⁶

(22) Permissive Interpretation: \rightarrow *It's OK to not eat the other stuff.*

- a. Egyél csak almá-t!
 eat.SUBJ.2SG only apple-ACC Hungarian
- b. Pojedi samo jabuku!
 eat.IMP only apple-ACC Serbian
 'Eat only the apple.'

(23) Prohibitive Interpretation: \rightarrow *You are not allowed to eat other stuff.*

- a. Csak az almá-t edd meg! Hungarian
 only the apple-ACC eat.SBJV.2SG PRT
- b. Samo jabuku pojedi!
 only apple-ACC eat.IMP Serbian
 'Only the apple eat.'

⁶Unlike Greek and Serbian, in Hungarian, the *in-situ only*-phrase is also unambiguous, only consistent with a permissive interpretation (p.c. Éva Dékány). At this point, I cannot offer a good explanation but this difference does not affect the main argument here.

In Bulgarian, however, focus fronting does not have the same effect. According to Roumi Pancheva, focus fronting does indeed yield a prohibitive interpretation with the overt modal (24b) but not with the imperative (25b). That is, both variants in the imperative seem to be ambiguous. For Snejana Iovtcheva, focus fronting does not yield a prohibitive interpretation either with an overt modal or with an imperative.

- (24) a. Možeš da izjadeš samo jabalkata.
 can.2SG SUBJ eat.2SG only the-apple
 ‘You can eat only the apple.’
- b. Samo jabalkata možeš da izjadeš.
 only the-apple can.2SG SUBJ eat.2SG
 ‘Only the apple you can eat.’
- (25) a. Izjaž samo jabalkata.
 eat.IMP only the-apple
 ‘You can eat only the apple.’
- b. Samo jabalkata. izjaž.
 only the-apple eat.IMP
 ‘Only the apple you can eat.’

The data in all languages require further exploration. For the lack of effect in Bulgarian, different possibilities arise. One possibility suggested by the reviewer is that there are two groups of speakers. A different possibility suggested to me by Snejana Iovtcheva is that in Bulgarian fronting of the *only*-phrase is not necessarily focus movement but can also illustrate a topic dislocation, which would then allow a strengthened interpretation of the imperative. Further investigation into the cross-linguistic patterns is necessary. However, the common behavior of Greek, Hungarian and Serbian lends support to the current hypothesis. The fact that we do not find the opposite pattern, i.e. imperatives patterning with necessity modals under focus fronting, is suggestive.

In what follows, I show how we can derive the observed pattern assuming that the imperative operator has existential force. Assuming universal force derives the wrong meaning in the case of overt movement. If there is no operator at all, it becomes impossible to account for the scope interaction with overt movement.

3.1.3 Deriving the scope ambiguity

For the purposes of the discussion here, I follow a version of Horn’s (1969) analysis of *only* as a presupposition trigger; *only* takes as its argument a proposition p , presupposes that p is true and asserts the negation of all alternatives of p . Following Rooth (1992), the alternatives of p are computed by substituting the focused constituent ROUND with the relevant alternatives in (9–10) (i.e. SQUARE/TRIANGLE). Let us assume that *imp* functions as an existential modal operator which takes as its argument a proposition from worlds to truth values deriving the meaning in (26) that *there is*

a possible world w' in which the speaker's desires are satisfied and the prejacent is true in w' .⁷

$$(26) \quad \llbracket \text{Open the window} \rrbracket^{w,c} = \exists w' \in W. S_c \text{'s desires in } w \text{ are satisfied in } w' \wedge A_c \text{ opens the window in } w'$$

Later on I will propose a decomposition of the imperative operator (*imp*) into two components: i) *imperative mood* restricting the worlds of evaluation and, ii) an existential operator which binds the open world variable. However, this decomposition of *imp* does not affect the line of argument here. The main explanation relies on whether the *only*-phrase is interpreted above or below *imp*. In particular, for our original example in (14), if *only* is interpreted above *imp* and *imp* has existential force, then we expect a prohibitive interpretation for the alternatives, since they are negated under Horn's (1969) analysis (*not allowed to paint round/square table*). By contrast, if the *only*-phrase is interpreted below *imp*, then we expect a permissive interpretation that the *addressee is allowed to not paint the rest of the tables*.

The two patterns are shown below. When *only* has narrow scope, it attaches to the prejacent (below *imp*) yielding the LF in (27a) and the corresponding alternatives (*A paints the round/square/triangle table*). When *only* has wide-scope, it merges above *imp*, deriving the LF in (27b) and the alternatives that $\exists w' \in W. S \text{'s desires in } w \text{ are satisfied in } w' \wedge A \text{ paints the ROUND/SQUARE/TRIANGLE table in } w'$:

$$(27) \quad \begin{aligned} \text{a. } & \text{LF}(\diamond_{imp} > \text{only}): [\diamond_{imp} \llbracket \text{only(C) round}_F \text{ table} \rrbracket [\lambda x [\text{you paint } x]]] \\ \text{b. } & \text{LF}(\text{only} > \diamond_{imp}): [\text{only(C) round}_F \text{ table}] [\lambda x [\diamond_{imp} [\text{you paint } x]]] \end{aligned}$$

Based on this, when *only* is interpreted below *imp*, we get the meaning in (28a) that *there is a world consistent with S's desires and A doesn't paint the square/triangle table in this world*. When *only* takes scope above *imp*, we get the interpretation in (28b) that *there is no world consistent with S's desires in which A paints the square/triangle table*:

$$(28) \quad \begin{aligned} \text{a. } & \exists w' \in W. S \text{'s desires in } w \text{ are satisfied in } w' \wedge \neg [A \text{ paints the SQR/TRG} \\ & \text{table in } w'] \\ & \rightarrow A \text{ is allowed to not paint the other tables.} \\ \text{b. } & \neg \exists w' \in W. S \text{'s desires in } w \text{ are satisfied in } w' \wedge A \text{ paints the SQR/TRG} \\ & \text{table in } w' \\ & \rightarrow A \text{ is not allowed to paint the other tables.} \end{aligned}$$

The data from Greek show that when the *only*-DP overtly moves, we get a wide scope reading. The interpretation of wide-scope *only* in imperatives reveals an existential operator. In the following section, it is shown that assuming a universal operator makes it hard to account for the case in which the *only*-phrase moves overtly.

3.1.4 Scope facts under a universal analysis of *imp*

Under a universal analysis of the imperative operator, we can derive the expected interpretation for the examples in which *only* is in-situ, but we derive the wrong

⁷This analysis of imperatives involving a modal base relativised to the speaker's desires is not uncontroversial. I will elaborate more on the modal flavor of imperatives in Sect. 5.

reading for the examples in which *only*-DP moves overtly. With a universal modal, when *only* is in-situ, two interpretations are derived. The surface scope interpretation is that the addressee is required to not paint the other tables, which fits the dialogue in (10). The inverse scope interpretation in which *only* scopes above the universal modal would be that there is no requirement for the addressee to paint the other tables which fits the dialogue in (9).

- (29) Vapse mono to strogilo trapezi!
 paint only the round table
 → $\square > \text{only}$: *A is required not to paint the other tables.*
 → *only* > \square : *A is not required to paint the other tables.*

However, when the *only*-phrase moves, only the wide scope reading (*only* > \square) is expected to survive. This interpretation is infelicitous as a response to A's utterance in (10) (*Oh, I feel like doing something really useful today. I think I'll paint the tables over there.*), because it conveys that *A is not required to paint the other tables*, whereas the desired interpretation is that *A is required to not paint the other tables*.

If we assume an ambiguous analysis of imperatives, argued by Grosz (2011), we would expect two possible readings for the example with overt focus movement:

- (30) [mono to strogilo trapezi] vapse!
 only the round table paint!
 → *only* > \square : *A is not required to paint the other tables.*
 → *only* > \diamond : *A is not allowed to paint the other tables.*

The absence of the reading in which *only* has wide scope above a universal modal suggests that the imperative operator must bear existential force. Unless there is some mysterious condition under which overt movement blocks the universal reading, it is difficult to explain the interpretation of (30) assuming an ambiguity analysis.

3.1.5 Scope facts under a minimal approach

Assuming that there is no operator in the semantics, it is not possible to explain the facts as a scope ambiguity. Haida and Repp (2012) attempt to explain the ambiguity of the English data, not as a scope ambiguity, but as an ambiguity which arises by the imperative being interpreted as *command* or *permission*. However, the Greek overt movement data show that the ambiguity is scopal in nature.

One solution would be to postulate a speech act operator (as in Han's 1998 analysis and unlike Portner's 2004 proposal). In this case however, it is under question whether *only* could scope as high as a speech act operator (see Krifka 2001; Iatridou and Tatevosov 2016). A different alternative, suggested by a reviewer, would be to postulate a mapping rule between word order and interpretation but in this case, we could not explain why fronting has the same effect with overt existential modals.

In what follows, I present two more environments which reveal the existential character of imperatives: interaction with the scalar particle *akomi ke* 'even' and Free Choice licensing.

3.2 Imperatives and *akomi ke* ‘even’

Additional evidence for the existential character of the imperative comes from the licensing of the Greek scalar additive particle *akomi ke* ‘even.’ Below, I show that the licensing requirements for *akomi ke* are such that in some cases its compatibility with an imperative reveals the presence of an existential operator.

Akomi ke can be analysed, similarly to *even*, as a propositional operator which gives rise to two presuppositions; it presupposes that i) the proposition is less likely than its alternatives (scalar presupposition) and ii) that some proposition from the contextual alternatives is also true (additive presupposition) (see Giannakidou 2007; Barouni 2018). For example, for a sentence like (31) we get two presuppositions as in (32):

- (31) O Louky kalese *akomi ke* ton Papa!
the Louky invited even and the Pope.
‘Louky invited even the Pope.’
- (32) a. Scalar presupposition: The Pope is the least likely to be invited by Louky.
b. Additive presupposition: Someone else other than the Pope has been invited by Louky.

Crucially, *akomi ke* is not licensed with predicates like *vote* in episodic contexts. The additive presupposition cannot be satisfied because world knowledge tells us that we can vote only for one party. As a result the sentence in (33), like its English counterpart, is judged infelicitous by native speakers:

- (33) # Se aftes tis ekloges i Ana psifise *akomi ke* Nea Dimokratia.
in these the elections the Ana voted even and Nea Dimokratia
‘In these elections, Ana voted even for Nea Dimokratia.’

However, in the presence of an existential modal operator, the sentence becomes fine since the additive can take wide scope above the modal. Consider a context in which the speaker generally supports left-wing parties, but in this case there are some local elections of no importance. In this case the sentence in (34) expresses that *it’s OK to vote for the right-wing party Nea Dimokratia*, thus providing permission or consent.

- (34) Se aftes tis ekloges boris na psifisis *akomi ke* Nea Dimokratia.
in these the elections can.2SG SUBJ vote2SG even and Nea Dimokratia
‘In these elections, you can vote even for Nea Dimokratia.’

Assuming that in this context the possibility modal *boris* ‘can’ provides permission and has a bouletic character (see Lauer 2015), the sentence conveys that:

- (35) a. There is a possible world compatible with the speaker’s desires in which the addressee votes for Nea Dimokratia (*assertion*).
b. Nea Dimokratia is the least likely party that there is a possible world compatible with the speaker’s desires in which the addressee votes for it (*scalar presupposition*).

- c. There is another party different from Nea Dimokratia such that there is a possible world compatible with the speaker's desires in which the addressee votes for this party (e.g. a left-wing party) (*additive presupposition*).

Crucially, we can have exactly the same interpretation in the same context with an imperative as shown in (36). This can only be explained if there is an operator above which *akomi ke* 'even' can take scope and also if this operator is a possibility modal operator.

Context: Mary generally supports the left-wing parties and she tries to convince people to vote for a left party. However, this time there are some local elections of no importance. In this context, she can utter the imperative in (36) conveying that it's OK for her even if the addressee votes for the right wing party Nea Dimokratia:

- (36) Se aftes tis ekloges psifise akomi ke Nea Dimokratia.
 in these the elections vote.IMP even and Nea Dimokratia
 'In these elections, vote even for Nea Dimokratia.'
 ~ In these elections, you can vote even for Nea Dimokratia...

These data converge with the evidence from the previous section, that imperatives involve an existential modal.

Notice that under a universal modal hypothesis the licensing of *akomi ke* 'even' is harder to explain. A universal modal operator is not licensed in this context. The modals *hriazete*, *prepi*, *tha prepe* and the bouletic attitude verb *thelo* 'want' do not license *akomi ke* 'even':⁸

- (37) # Se aftes tis ekloges hriazete /prepi /tha-prepe /thelo na
 in these the elections need.3SG /must /should /want.1SG SUBJ
 psifisis akomi ke Nea Dimokratia.
 vote.2SG even and Nea Dimokratia
 a. # In these elections, you have to/must/should vote even for Nea Dimokratia.
 b. # In these elections, I want you to vote even for Nea Dimokratia.

An ambiguity approach can also account for the licensing of *akomi ke* 'even' but as we saw in the previous section an ambiguity hypothesis is not supported by the scope facts with *mono* 'only.'

English differs from Greek in the interaction of *even* with imperatives and the judgements for sentences like (36) vary among different speakers. For some speakers the translation in (36) is completely out and for others it is only marginally accepted.⁹ Although, it is not clear to me what the source of difference is between English and Greek, there is independent evidence from the interaction of the imperative with *even* in English supporting the underlyingly existential character of imperatives.

⁸One reviewer suggests that the sentence in (37) is felicitous if *akomi ke* takes scope over the VP/IP, suggesting that the speaker asks the addressee to perform a series of action including voting for this party. Although, I do not have this reading in this sentence, its availability does not interfere with the thread of the argument presented here. The context in (36) is only consistent with a narrow scope interpretation of *akomi ke* 'even.'

⁹I am grateful to Amanda Swenson and Benjamin Lowell Sluckin for discussing the data with them.

Francis (2019) shows that when *even* associates with the preadjacent proposition (broad focus *even*), the imperative must be interpreted as providing permission, i.e. it can only have a weak possibility modal interpretation. This is illustrated in (38–39). In (38), where the context foregrounds a *command* interpretation, a broad focus *even* yields infelicity, whereas in (39) it is perfectly fine with a *permission*-interpretation.

Context: *Prof. X is invigilating an exam and orders the students to stop writing.*

(38) Put down your pens. [Close your exam papers]_F #even.

Context: *Prof. Y is telling students who have been writing an exam that the test will no longer count toward their grades and they are free to do whatever they like.*

(39) Put down your pens. [Close your exam papers]_F even. (Francis 2019: 4–5)

Francis (2019) builds on a version of the current proposal, analysing imperatives as involving an existential modal which can be strengthened to convey necessity by exhaustifying over the alternatives. When *even* takes wide scope over the entire proposition, it predicts an additive presupposition for the preadjacent and the alternatives. In this case it is presupposed that the addressees are simultaneously required to close and not close their papers. Thus, Francis (2019) derives the infelicity of broad focus *even* with imperatives as one of additive presupposition.

These data cannot be tested in Greek, as Greek *akomi ke* cannot take broad focus based on judgements from six speakers who I have consulted on Greek *akomi ke*.

Despite the differences between the Greek and English additive scalar particles, evidence converges with the conclusion derived in the previous section regarding the interaction of the exhaustive particle *mono* ‘only’ with imperatives. These facts present evidence for the presence of an operator in the semantics (otherwise scope interactions are difficult to explain) which must be existential in nature. Further evidence comes from Free Choice Items (FCIs) with imperatives both in English and Greek.

3.3 FCIs and imperatives

As it is well-discussed, imperatives license Free Choice Items (FCIs) (Schwager 2006; Aloni 2007; Kaufmann 2012; a.o.):

- (40) a. Pick any flower!
b. Read any book!

Given that unmodified FCIs are licensed with existential (41) but not with universal (42) modals, the compatibility of FCIs with imperatives can be taken as a supporting argument in favor of an existential analysis and against a universal analysis of imperatives.

- (41) a. You may pick any flower!
b. You may read any book!
- (42) a. *You must/should pick any flower!
b. *You must/should read any book!

However, such a conclusion is disputed in the literature (Han 2000; Kaufmann 2012), arguing that the data are more complex, supporting the universal approach. I briefly discuss their points showing that the first impression that imperatives behave as involving an existential modal in these contexts, is the right one.

Kaufmann (2012) argues that an imperative involving a FCI is not in fact interpreted as the corresponding sentence with an overt existential modal. In particular, she analyses an example like (40a) as having the interpretation that *the addressee must pick a flower* and that the speaker is indifferent as to which flower the addressee will pick (e.g. *you must pick a flower but I don't care which*).

However, this intuition is contradicted by the following examples where the continuation clearly indicates that the pre-jacent of the imperative is not taken to be a requirement by the speaker:

Context: *A mother and her five-year-old son are visiting the botanical garden 'Jardin des plantes' in Paris. Her son, who aspires to become a gardener, wants to cut some rare lilies to plant in his small garden. His mom, manages to convince him not to but he stays grumpy the entire time. When they arrive at her sister's place which has a small garden, his mom says:*

- (43) a. Here you go! Now pick any flower! Not that I'm happy with this but at least we will not end up imprisoned...
- b. Oriste! Tora kopse opjodipote luludi! Ohi oti mu aresi
 here-you-are now cut.IMP any flower not that me.CL like.3SG
 kati tetio, omos tulahiston edo den tha mas valun filaki.
 something this but at-least here not FUT us.CL put.3SG prison
 'Here you are! Now cut any flower. Not that I like this but at least here they will not imprison us.'

In this example, it is clear that the parent imposes no obligation to the child to pick a flower and yet the FCI imperative is perfectly fine in this context.

The existential character of the imperative becomes even clearer when a FCI combines with an exceptive as in (44). In this example, the speaker would prefer that *the addressee doesn't sing any song* as the continuation suggests. The meaning that we get is that the addressee is allowed to sing any song except a particular one. It cannot mean that he is obliged to sing a song.

- (44) a. Please, sing any song except this one. And even better keep your mouth shut.
- b. Se parakalo, traguda opjodipote tragudi ektos apo afto. Ke
 CL.2SG please sing.IMP any song except from this and
 tha tan akomi kalitera an den tragudages tipota.
 FUT be.PAST.3SG even better if not sing.PAST.2SG anything.
 'Please, sing any song except this one. And it would be even better if you didn't sing anything.'

Notice that any sort of universal modal combined with an exceptive FCI sounds odd:¹⁰

¹⁰A reviewer notes that it is possible to have a FCI in Greek following a necessity modal as long as there is a definite or indefinite article (Giannakidou 2001). Vlachou (2007) argues that in this case FCIs express

- (45) a. #You must/have to sing any song except this one.
 b. #Prepi/hriazete na tragudisis opjodipote tragudi ektos apo afto.
 must/have-to SUBJ sing.2SG any song except from this
 ‘You must/have to sing any song except this one.’

A possibility modal is, of course, compatible and the interpretation is very similar to the one we get with imperatives:

- (46) a. You can sing any song except this one.
 b. Boris na tragudisis opjodipote tragudi ektos apo afto.
 can.2SG SUBJ sing.2SG any song except from this
 ‘You can sing any song except this one.’

Free choice phenomena have received different analyses varying in the proposed force and the position of the FCI (see Chierchia 2013; Dayal 2013; Menendez-Benito 2005, 2010; a.o.). Under a common approach, FCIs have universal force (cf. Menendez-Benito 2010). Under this hypothesis, imperative sentences with FCIs can be analysed as involving a possibility modal operator which is in the scope of a universal quantifier. Giannakidou (2001), who analyses free choice items as indefinites, treats free choice imperatives as in (43) as involving a possibility operator. Assuming that imperatives involve a universal operator, it would be hard to account for FCI licensing. Notice, however, that these data can also be accounted for under an ambiguity analysis of imperatives.

Although we cannot do justice to the topic of Free Choice in imperatives in the scope of the present discussion, the data we saw suggest that the distribution of FCIs remains a good reason to doubt an all-universal analysis of imperatives (see Menendez-Benito 2005 for a similar argument in favor of an existential analysis of generic sentences).

3.4 Interim summary

In this section, I presented evidence from the interaction of imperatives with *mono* ‘only’ and *akomi ke* ‘even’ as well as from the distribution of FCIs in favor of the existential character of imperatives. The question arising is whether we can formulate an analysis which can capture these facts without ignoring the possible stronger meanings of imperatives.

Stronger imperatives come in two varieties: the first type involves plain imperatives which can express request, command or strong advice as we saw in (1). As will be shown in Sect. 6, this type can be derived from a primarily existential meaning. However, there is a second type of strong imperative which cannot be captured if we analyse imperatives as always involving an existential operator. These are cases in which the imperative combines with a modal adverb expressing necessity or graded modality, which are discussed in detail in the next section.

indiscriminacy in the sense of Horn (2000). I am grateful to the reviewer for pointing out this alternative interpretation for FCIs which combine with an indefinite article in Greek. In these cases, I assume that the imperative is strengthened to convey necessity as explained in Sect. 6. Another reviewer commenting on the English example in (45a) reports that it doesn’t sound as odd with *have to*. Perhaps the interpretation allowed also in English is an *indiscriminacy* reading.

4 Imperatives combined with modal adverbs

This section presents two types of imperatives whose force seems to be dependent on a specific adverbial. Imperatives in Greek can combine with an adverbial expressing universal force and derive an unambiguously strong (*command*) interpretation as in (47a) or with an adverbial encoding a comparative preference as in (47b).¹¹ The latter has also a counterpart in English, *better*:

- (47) a. Oposdipote fige.
definitely leave.IMP.2SG
'Definitely leave.'
- b. Kalitera fige.
better leave.IMP.2SG
'You better leave.'

Interestingly, the interpretation of (47a) cannot be derived under an existential analysis whereas (47b) is not consistent with either an existential or a universal analysis. This is important because it suggests that we need to refine our analysis of imperatives in a way that the existential operator is not always present in imperatives. This will lead us to Sect. 5, which develops an analysis for the observed variation without resorting to polysemy.

In what follows, I present the properties of *oposdipote*- and *kalitera*-imperatives.

4.1 *Oposdipote*-imperatives

The adverbial *oposdipote* is generally used to express necessity and it is compatible both with epistemic and deontic/bouletic necessity as shown in (48a) and (48b) respectively.¹²

- (48) a. O Nikos irthe oposdipote.
the Nick came definitely
'Nick has definitely come.'
- b. Prepi/hriazete oposdipote na erthis.
must/have-to definitely SUBJ come.2SG
'You must definitely come.'

¹¹These are true adverbials that, in one way or another, define the quantificational force of the imperative. They should be distinguished from certain particles in other languages, e.g. in German *bloss/IA* discussed by Grosz (2011) and Kaufmann (2012), which are classified as discourse particles, and they cannot convey necessity on their own. I am making no claims regarding these particles in this paper. Notice that *oposdipote* and *kalitera*, like other modal adverbials, can appear in different positions but we assume that underlyingly the proposition is their complement.

¹²The exact meaning of *oposdipote* is hard to define in these environments. The interpretation is something like 'under all circumstances.' It is interesting that morphologically it has the same form as Free Choice Items in Greek (i.e. wh-word + the suffix *dipote*) but it doesn't behave like the other Free Choice Items (see Giannakidou 2001). It is more accurate to describe it as a necessity adverbial. Interestingly, in German, the phrase *auf jeden Fall* seems to have a similar function deriving an unambiguously strong imperative meaning. The sentence *Komm auf jeden Fall!* roughly means 'Definitely come!' In (48a) it expresses epistemic certainty. In (48b) it appears with an overt modal which expresses deontic necessity, and *oposdipote* adds more emphasis (i.e. as modal concord as in Zeijlstra 2007 a.o.)

When *oposdipote* is used with a possibility modal or even a weak necessity modal, the sentence is interpreted as involving two modal operators: a possibility or a weak necessity modal, and then on top of it, a necessity modal which, as shown in the following examples, expresses epistemic necessity. For example, the speaker given what he knows (e.g. *that the work has finished, that nobody else is going to call*) provides permission or reports that the addressee can leave. In this case, however, *oposdipote* must appear either in the beginning or in the end of the clause with an intonational break between *oposdipote* and the prejacent.

- (49) (Oposdipote), boris na figis, (oposdipote).
 definitely can.2SG SUBJ leave.2SG definitely
 ‘Definitely/absolutely, you can leave.’

Similarly, if there is an intonational break between *oposdipote* and the imperative, it results in an epistemic necessity modal on top of the existential, as predicted by the hypothesis that imperatives involve an existential modal. In these cases, *oposdipote* has to either precede or follow the imperative proposition. However, when there is no intonational break or when the adverbial appears inside the clause (50b), the imperative is unambiguously interpreted as a command, i.e. inducing a requirement. This is illustrated by applying the same tests we used in Sect. 3 to argue in favor of the existential character of plain imperatives.

- (50) a. Oposdipote, pigene sto parti.
 definitely go.IMP to-the party.
 ‘Definitely, you can go to the party.’
 b. Pigene oposdipote sto parti.
 go.IMP definitely to-the party.
 ‘Go definitely to the party.’ \leadsto *You must go to the party.*

First, when we have both *oposdipote* and *only* in a sentence, we observe that when the *only*-phrase precedes the verb and *oposdipote* as in (51), we get an interpretation that *for the other books it’s not necessary that A reads them*. The compatibility of the continuation in (51a) as opposed to the continuation in (51b) shows that *only* here takes scope above a necessity modal:

- (51) Mono afto to vivlio diavase oposdipote.
 only this the book read.IMP definitely
 ‘Read only this book definitely.’
 a. Ta ala ine proeretika. *only* > □
 the others are optional
 ‘The others are optional.’
 b. #Ta ala tha se berdepsun ke den tha grapsis kala. □ > *only*
 the others FUT you confuse and not FUT write well.
 ‘The others will confuse you and you will not write well (if you read them).’

When ‘only’ appears below the verb and *oposdipote*, the *b*-continuation becomes immediately felicitous, and the interpretation we get is that *it’s necessary to read only this book and not read the other ones*. In this case, however, when the *only*-phrase is in-situ the wide scope interpretation of *only* is also possible (especially with certain intonation) thus rendering the *a*-continuation of (51) felicitous as well.¹³

- (52) Diavase oposdipote mono afto to vivlio.
 read definitely only this the book
 ‘Definitely read only this book.’
 a. You are required to not read other books.
 b. You are not required to read other books.

The necessity character of *oposdipote*-imperatives is also instantiated by the fact that they do not license FCIs as opposed to plain imperatives. To the extent that (53a) is felicitous, it is only under the reading of the existential FCI expressing indiscriminacy as discussed in detail in Vlachou (2007). This reading is better expressed with the indefinite *ena* as in (53b) (see also fn. 10).

- (53) a. %Tragudise oposdipote opjodipote tragudi.
 sing.IMP definitely any song
 ‘Definitely sing any song.’
 b. Tragudise oposdipote ena opjodipote tragudi.
 sing.IMP definitely one any song
 ‘Definitely sing any song.’

Similarly, a FCI combined with an exceptive phrase is not felicitous with *oposdipote*:

- (54) #Tragudise oposdipote opjodipote tragudi ektos apo afto.
 sing.IMP definitely any song except from this
 ‘Definitely sing any song except this one.’

Under all diagnostics *oposdipote*-imperatives pattern with universal modals. This is further shown by the fact that the scalar additive particle *akomi ke* is inconsistent with an *oposdipote*-imperative as in (55).

¹³Interestingly in Hungarian we observe the same restrictions when an imperative combines with an adverbial encoding strong necessity. In Hungarian imperatives can combine with one of the two adverbials *feltétlenül/mindenképpen* ‘absolutely, by all means’ deriving an unambiguously strong interpretation. Crucially, when the *only*-phrase moves in front of the verb preceding the adverbial as in (i), the interpretation is exactly like in Greek, i.e. that it is only the apple that needs to be eaten.

- (i) Csak az almá-t edd meg feltétlenül/mindenképpen!
 only the apple-ACC eat.SBJV.2SG PRT by.all.means
 ‘It is only the apple that you absolutely have to eat (you are allowed to eat other stuff as well).’

This is the opposite reading from the one derived without the strong adverbial as in (23a), for which movement revealed an existential modal, deriving the interpretation that the addressee is not allowed to eat other stuff. I tried to elicit similar data for Serbian but it was not possible to identify a similar element with *oposdipote*. I am extremely grateful to Éva Dékány and Ivona Ilić for discussing the data. Also to the reviewers who raised the discussion about other languages.

- (55) #Psifise oposdipote akomi ke Nea Dimokratia.
 vote.IMP definitely even ADD Nea Demokratia
 ‘Definitely vote even Nea Demokratia.’

The only way to interpret (55) is to read it as having two sentences but in this case a long pause is necessary after *oposdipote*. As a reviewer points out, in this case the second sentence involving the scalar particle *akomi ke* will involve an elided imperative *psifise* ‘vote.’ Crucially, under the account I present in Sect. 5, we predict that the imperative in the second clause can express possibility because what is elided is of unspecified quantificational force (see fn. 15).

Having shown that imperatives which combine with *oposdipote* obligatorily get a necessity interpretation, we can now turn to the interpretation of imperatives which combine with *kalitera* ‘better.’

4.2 *Kalitera*/(better)-imperatives

When *kalitera* ‘better’ combines with an imperative as it does in (56), it compares two alternatives and states that one is better than the other. In particular, we get the interpretation that *the speaker believes that it’s better for the addressee to leave than stay*.

- (56) *Kalitera fige*.
 better leave.IMP.2SG
 ‘You better leave.’

In more complex sentences we can see that the alternatives depend on focus alternatives. For example, in (57a) the indirect object is focused deriving alternatives of the form *better give x the book* whereas in (57b) the direct object is focused deriving alternatives of the form *better give John x*:

- (57) a. *Kalitera dose ston GIANI to vivlio*.
 better give to-the JOHN the book
 b. *Kalitera dose ston Giani to VIVLIO*.
 better give to-the John the BOOK
 ‘You better give John the book.’

The alternative can also be overtly represented with a comparative *than*-phrase.

- (58) a. *Kalitera dose ston GIANI to vivlio para ston Petro*.
 better give to-the GIANI the book than to Peter
 ‘You better give the book to John than Peter.’
 b. *Kalitera dose ston Giani to VIVLIO para to portreto*.
 better give to-the John the BOOK than the portrait
 ‘You better give John the book than the portrait.’

In Greek the overt alternative can often involve an imperative verb, suggesting that the complement to the *than*-phrase is also an imperative clause. This will be important when the internal structure of *kalitera*-imperatives is discussed in Sect. 5.4.

- (59) Kalitera mine para fige.
 better stay.IMP.2SG than leave.IMP.2SG
 ‘Better stay than leave.’

Kalitera-imperatives are different from plain imperatives as they cannot be used in *permission/invitation* contexts or in *command/requests* in which a plain imperative gets a strong interpretation. Moreover, the tests that we presented for the existential character of imperatives do not work for *kalitera*-imperatives. FCIs are not licensed and it is not possible for *mono* ‘only’ to scope above *kalitera*. *Mono* ‘only’ must be in the scope of *kalitera* ‘better’ as shown in (60). In both sentences *kalitera* is interpreted above *only*, yielding the interpretation that *it is better to eat the apple and not eat something else*.

- (60) a. Kalitera fae mono to milo.
 better eat.IMP only the apple
 ‘You better eat only the apple.’
 b. Mono to milo fae kalitera.
 only the apple eat.IMP better
 ‘You better eat only the apple.’

Similarly, the scalar element *akomi ke* ‘even’ cannot scope above *kalitera* ‘better’ and generate a sensible interpretation, as illustrated in (61):

- (61) *Kalitera psifise akomi ke Nea Dimokratia.
 better vote.IMP even and New democracy

Kalitera ‘better’ is only licensed with imperatives and root subjunctives. It cannot combine with possibility (62a), necessity (62b) or weak necessity modals (62c). This is true for Greek and for English. Some English speakers marginally accept *better* with weak necessity modals but they still consider them degraded, using a different construction instead.¹⁴

- (62) a. *Kalitera boris na figis.
 better can.2SG SUBJ leave
 ‘You can better leave.’
 b. *Kalitera prepri/hriazete na figis.
 better must/have-to SUBJ leave.2SG
 ‘You must better leave.’

¹⁴Notice however that in some languages the equivalent of *better* is compatible with a weak necessity modal or even a possibility modal. Meertens and Lauer (2018) present in detail how the German and Dutch counterpart of *kalitera* differ from each other as well as from the English *better*. In Serbian the equivalent of *better*, *bolje*, can be used with an imperative and similarly to Greek it cannot be used with an overt possibility or a (weak) necessity modal (p.c. Ivona Ilić). In Hungarian the equivalent of *better*, *jobb*, cannot be used with the imperative/subjunctive form. Instead, there is an alternative element, *inkább* translated as ‘rather’ which seems to function like *better* and is compatible with the imperative, e.g. *Inkább egyél almát, mint csokit.* ‘Rather eat the apple than the chocolate.’ (p.c. Éva Dékány). As Meertens and Lauer (2018) point out there are crosslinguistic differences in the function of *better*-items, thus one needs to examine carefully each case in order to derive safe conclusions about the meaning of *better*-imperatives.

- c. *Kalitera tha prepe na figis.
 better FUT must.PAST.2SG SUBJ leave.2SG
 ‘You should better leave.’

It is clear that we are dealing with three different creatures:

- i. Plain imperatives → *Existential force*
- ii. *Oposdipote*-imperatives → *Universal force*
- iii. *Kalitera*-imperatives → *Comparative modality*

This variability in meaning can be explained either assuming that imperatives are truly polysemous or under a unified analysis in which variation arises due to the presence of *oposdipote* and *kalitera* respectively.¹⁵ In this paper, I endorse the latter option arguing that the imperative construction has a basic unified meaning which is enriched depending on the environment it appears in.

5 Imperatives are minimal but modalized

In this section, I develop an analysis in which the imperative form per se does not involve a modal operator. Instead, I suggest that the imperative form, at least in Greek and other languages with imperative morphology, corresponds to imperative verbal mood with a special [+IMP]-feature (see Rivero and Terzi 1995 a.o.).¹⁶ While [+IMP]-mood carries certain presuppositions which enforce a modal interpretation, it does not contribute a special quantificational force. In this way, the complex facts we presented in the previous sections will be accounted for. On the one hand, the scope facts revealed an underlying possibility operator in imperatives while, on the other hand, in

¹⁵As hinted earlier, the ellipsis data go against a polysemy analysis. Assuming that the elided material must be semantically equivalent with its antecedent, the following example is difficult to be explained under a polysemy analysis. Imagine a context in which three athletes in a sporting event are informed that they will compete earlier than expected. As their schedule changes, they are uncertain about whether they should eat something before and if so what. Therefore, they ask their coach who tells them:

- (i) Esi, Anna, afu den pinas, min fas i fae ena milo gia paradigma. Esi Petro
 you Anna since not hungry.2SG not eat.2SG or eat.IMP an apple for example you Peter
 kalitera mia plusia salata. Ke esi Niko oposdipote ligo moshari. Hriazese sidiro.
 better a rich salad and you Niko definitely little beef need.2SG iron
 ‘You, Anna, since you are not hungry, don’t eat or eat an apple for example. You, Peter, better
 <eat> a rich salad and you, Nick, definitely <eat> some beef. You need iron.’

While the first imperative is clearly interpreted as a weak imperative by virtue of the preceding sentence (*don’t eat*) and the *for example*-expression, in the second clause the elided imperative gets a stronger interpretation associated with *kalitera* ‘better’ and the last one is interpreted as a strong necessity in the presence of *oposdipote*. Assuming that the imperative form always has a fixed quantificational force as an integral part of its meaning would make it hard to account for the interpretation of elliptical constructions as in (i).

¹⁶As pointed out to me by Magdalena Kaufmann, this analysis shares some assumptions with Roberts’s (2015) proposal, which also combines features from both the minimal and the modal approach. Although implemented in a totally different way, similar to what is argued in the present paper, the prioritizing component is a presupposition. However, Roberts’s (2015) analysis does not end up with an existential force. Charlow (2014) also presents a proposal which can be characterized as combining features from the minimal and the modal approach that he calls *Modal NonCognitivism*.

the presence of an overt quantificational operator imperatives acquire the force of this operator.

In what follows, I show that the underlying possibility meaning of an imperative like ‘Open the window’ in (26) repeated in (63), can be derived in two different steps.

$$(63) \quad \llbracket \textit{Open the window} \rrbracket^c = \exists w' \in W. S_c \textit{'s desires in } w_c \textit{ are satisfied in } w' \wedge A_c \textit{ opens the window in } w'$$

First, it is necessary to consider the internal make-up of an imperative clause. Suppose that the imperative form only involves a *mood*-Phrase with an imperative feature as in (64):

$$(64) \quad [MoodP \textit{ Mood}_{IMP} [TP \textit{ T} [VP \dots]]]$$

The meaning derived at the level of *MoodP* is the propositional content *plus* whatever the semantic contribution of *Mood_{IMP}* is. Our next task is to define the role of *imperative mood* (*Mood_{IMP}*) which is critical for the derivation of the imperative meaning. For this, I introduce some necessary background on verbal mood.

5.1 Background on verbal mood

Verbal mood is usually discussed in relation to the distribution of *indicative* vs. *subjunctive* in embedded contexts. In most cases, *imperative verbal mood* is either not discussed at all, or it is taken to be the verbal mood of the *imperative sentence mood*. It is not possible within the scope of this paper to review all previous theories of verbal mood (Farkas 1992b, 2003; Portner 1997, 2011, 2018b; Schlenker 2005; Quer 2009; Portner and Rubinstein 2012; Giannakidou 2015; Silk 2018). There are good reasons to think that imperative mood shares many features with subjunctive (as opposed to indicative); however in this paper I will not get into their relation (see e.g. Huntley 1984; Portner 1997, 2015; Oikonomou 2016; Stegovec 2016). Instead, I focus solely on the imperative.

There are various ways in which the contribution of verbal mood has been described. A fruitful way put forth in various works with different perspectives (Portner 1997; Schlenker 2005; Matthewson 2010; Silk 2018) is to think of verbal mood as involving a feature which triggers a presuppositional restriction. The analysis of imperative mood developed here largely builds on Schlenker’s view of mood *as introducing a presupposition on world-denoting variables* (Schlenker 2005: 1).

5.1.1 Schlenker’s (2005) analysis of mood

Schlenker (2005) builds on the idea that mood can be analyzed on a par with tense and pronouns (see Stone 1997; Iatridou 2000; von Stechow 2002 for earlier parallelisms of this sort) *as presuppositions on the value of certain terms or variables*. Within this framework, he analyses indicative mood as carrying a marked feature triggering a presupposition that a proposition marked with indicative *denotes a world that lies in the Context Set of the speech act*. The notion of Context Set is introduced from Stalnaker (1975) and it refers to the set of the worlds which are compatible with what the speaker presupposes. Schlenker (2005) also argues that the subjunctive in

French is the default, and therefore does not trigger a presupposition. As I said, we are not going to discuss the *indicative-subjunctive* debate in this paper (see Portner and Rubinstein 2012 for an overview and some problems with Schlenker’s (2005) analysis of indicative mood). What is rather interesting for our purposes is Schlenker’s rather short and rough account of the contribution of imperative mood.

According to Schlenker (2005) *imperative mood* introduces a presupposition on the value of a term w indicating that the term w denotes a world which is compatible with *what the speaker requires* at the time and in the world of utterance (Schlenker 2005: 12).

In addition, he assumes that there is a covert operator in imperatives roughly meaning *I (=speaker) require that p*. Under this view, the meaning of an imperative clause with the contribution of the presupposition is that *each world compatible with what the speaker requires at the time and in the world of utterance is compatible with... what the speaker requires at the time and in the world of utterance*. As Schlenker (2005) points out this is vacuously true but the presupposition is satisfied.¹⁷

For the rest of this section, I invite you to consider what would happen if there is no covert operator in the first place as part of the imperative clause, and instead we only have a presupposition triggered by the imperative mood, similar to the one suggested by Schlenker (2005).

5.2 Imperative mood as triggering a presupposition

In many works, special imperative morphology has been associated with *imperative verbal mood* which carries a special [+IMP] mood feature. Following Schlenker’s (2005) insight, I argue that imperative mood triggers a presupposition restricting the reference of the world term w . In particular, *imperative mood* restricts the reference of the world term to worlds consistent with what the speaker desires at the utterance context c , which is defined by a quadruple containing a speaker S_c , an addressee A_c , a time t_c and a world w_c :

$$(65) \quad \llbracket mood_{IMP} \rrbracket^c = \lambda p \in D_{(st)}. \lambda w': S_c \text{ 's desires in } w_c \text{ at } t_c \text{ with respect to the } A_c \text{ 's actions are satisfied in } w'. p(w') = 1$$

$Mood_{IMP}$ is then a propositional operator which contributes only a presupposition. The meaning we derive now at the level of $mood_{IMP}P$ is a partial function from worlds to truth values:

$$(66) \quad \llbracket mood_{IMP} p \rrbracket^c = \lambda w': S_c \text{ 's desires in } w_c \text{ at } t_c \text{ with respect to the } A_c \text{ 's actions are satisfied in } w'. \llbracket p \rrbracket(w').$$

Now at the level of $mood_{IMP}$ there are different possibilities for the interpretation of the world term. One of these possibilities is for the world variable to be restricted

¹⁷For Schlenker’s (2005) point of view, who argues that the subjunctive is the default, the important thing in the denotation of imperative is that in the contexts in which the presupposition of the imperative feature is satisfied, it will win over the default subjunctive which is semantically vacuous (*maximize Presupposition*). Given that in Greek the situation is entirely different in that 2nd person subjunctive and imperative forms appear in the same contexts, the markedness considerations are not relevant. The interesting part of Schlenker’s (2005) approach is that mood can carry a feature which triggers a presuppositional restriction.

by the world of the utterance context c , which is usually the actual world. This would mean that it is presupposed that the speaker's desires are satisfied in the actual world and the prejacent holds in the actual world. However, we want to exclude this reading because as we know imperatives cannot express statements about the actual world. To illustrate, consider the contrast in (67):

- (67) a. #Stay! I know you will.
b. I want you to stay and I know you will stay.

On the contrary, the speaker needs to encounter both the prejacent and its negation to be viable possibilities. This is formalized in Kaufmann (2012) as the *Epistemic Uncertainty Condition*:

- (68) An utterance of an imperative p in context c is felicitous only if the speaker takes both p and $\neg p$ to be possible.

Although there are different ways to incorporate this intuition into the contribution of imperative mood, following Kaufmann's original intuition, I model this as an additional presupposition triggered by $mood_{IMP}$. Given the Epistemic Uncertainty Condition, we add to the denotation in (66) that the set of worlds consistent with the Speaker's beliefs in w_c (Bel'_{S_c}) contains w_1 and w_2 such that p is false in w_1 and true in w_2 .

- (69) $\llbracket mood_{IMP} p \rrbracket^c = \lambda w'$:
 S_c 's desires in w_c at t_c with respect to the A_c 's actions are satisfied in $w' \wedge \exists w_1, w_2 \in Bel'_{S_c}(w_c)[\neg p(w_1) \wedge p(w_2)]$. $\llbracket p \rrbracket(w')$.

Given the second presupposition in (69), we can exclude the possibility that the world variable is restricted by the world of the utterance context c , since this would amount to an assertion of p which is contradicted by the presupposition (the speaker takes both p and not p to be possible).¹⁸ Given that the world variable cannot be valued in context c , and in the absence of a quantificational operator to bind it, existential closure applies to bind the world variable similarly to the existential closure in other cases (e.g. event variable, individual variable in passives).¹⁹

In this case, the meaning we get for an imperative like *stay* is that *there is a world w' in which the addressee stays in w'* . The presuppositions will ensure that the relevant worlds are restricted to those consistent with the speaker's desires regarding the

¹⁸The idea that the world variable in directive forms cannot refer to the actual world is definitely not new in the literature (Farkas 1992a). For example, Huntley (1984) characterizes imperatives as moodless, therefore lacking a world variable altogether (see Mastop 2011 for a constructive criticism of this idea). In another context, Reis (2003) suggests that the modal character of German root infinitives can be derived from their lack of anchoring with respect to time and the factual world (due to lack of tense/mood specification) which in turn leads to modal anchoring in order to fulfill the communicative force of the utterance (see Reis 2003: 183–184 for details). Gärtner (2014) builds on this idea and suggests an analysis of German root infinitives as involving existential closure of the world variable because it cannot be deictic to the actual world. Although Gärtner (2014) abandons this proposal for independent reasons, the idea I present here is quite similar, guaranteeing that the world variable is disjoined from the actual world via the uncertainty condition.

¹⁹I am grateful to Sabine Iatridou for raising the possibility of having existential closure in imperatives at a very early stage of this work.

addressee’s actions and, in addition, via the uncertainty presupposition, it is ensured that the speaker considers both alternatives (A *stay*, \neg *stay*) possible.

$$(70) \quad \llbracket mood_{IMP} [A_c \textit{ stay}] \rrbracket^c = \exists w': \\ \frac{S_c \textit{ 's desires at } t_c \textit{ in } w_c \textit{ with respect to the } A_c \textit{ 's actions are satisfied in } w' \wedge \\ \exists w_1, w_2 \in Bel_{S_c}^t(w_c) [\neg p(w_1) \wedge p(w_2)]}{A_c \textit{ stays in } w'}$$

The formulation in (69) allows us to detach the information regarding the force of imperatives from the meaning of imperative mood, thus providing us with the flexibility we need to account for the cases when the imperative combines with adverbials encoding specific force like *kalitera* ‘better’ and *oposdipote* ‘definitely.’ Before moving on to see how we can derive the interpretations for these cases, let me go through some questions raised by the current proposal. Some of these questions constitute long-standing puzzles in the literature of imperatives, like the issue of the flavor of imperatives (i.e. bouletic, teleological, deontic) or the way to derive performativity in imperatives, especially under a modal approach. Before addressing these more general issues, I would like to elaborate on an issue specific to the present analysis, namely the way the presupposition of imperative mood projects (Heim 1983, 1992; Schlenker 2011).

Empirically, in order to derive the desired interpretation that there is *some* world which satisfies the speaker’s desires, and not the impossible reading, that all possible worlds are consistent with the speaker’s desires, either we need to have local accommodation or alternatively we can assume that the presupposition enforces an implicit domain restriction to those worlds which are consistent with the speaker’s desires. In the case of existential closure either approach would work. However for the cases of *oposdipote*- and *kalitera*-imperatives, local accommodation is not straightforward.²⁰ Thus, I take it that in all environments the weak inference we derive is not due to local accommodation but rather due to an implicit domain restriction enforced by the presupposition. Since contextual domain restriction in quantifiers is highly frequent especially when the domain broadly refers to a large set of individuals (e.g. *child* below), a presupposition can join the domain restriction of the quantifier. To illustrate, in a sentence like *Every child who walks his/her dog...*, we do not get a presupposition that *every child has a dog* rather we restrict the domain of quantification into children who have dogs. Similarly in the case of imperative mood, I will assume from now on that the presupposition results in contextual domain restriction, such that we now quantify over worlds that are consistent with the speaker’s desires.²¹

Now we can turn to the actual content of the presupposition. In the present paper, imperatives have a bouletic/prioritizing character such that the prejacet is at least, consistent with the speaker’s desires/priorities (for the *bouletic* character of imperatives see also Bierwisch 1980; Wilson and Sperber 1988; Condoravdi and Lauer 2012;

²⁰Under the Discourse Representation Theory (DRT, Geurts 1999; Beaver 2001), we expect local or intermediate accommodation in all cases. See also Sudo et al. (2012); Chemla (2009) for differences depending on the type of quantifier and also variation among speakers.

²¹I would like to thank two anonymous reviewers as well as Philippe Schlenker for extensive discussion on this matter.

Stegovec 2019). On the one hand, this captures the empirical observation that imperatives require that the speaker is not against the actualization of the event described by the preadjacent (*speaker endorsement* in Kaufmann 2012). On the other hand, there are uses of imperatives which pose a challenge for an analysis of imperatives as expressing the speaker's desires or priorities. For example, the case of disinterested advice (Kaufmann 2016) as in (71), in which the speaker (S) has no interest or preference for the addressee (A) to take the train:

- (71) A: How can I get to Nuremberg from Berlin?
S: Take the train.

Condoravdi and Lauer (2012) explain cases like (71) by general pragmatic principles. According to a general cooperative principle, the speaker adopts the addressee's goals/preferences as long as they do not contradict his/her own (thus satisfying *speaker endorsement*). I follow Condoravdi and Lauer's (2012) analysis in this respect, arguing that in cases of disinterested advice in which the addressee's priorities contradict the priorities of the speaker, advising fails as in the case of the dialogue in (72). This example also starts out as disinterested advice but ends up in different opinions between B and A, such that B doesn't seem willing to adopt A's view, despite not having a particular interest or preference in the given situation.

- (72) A. How do I cut the expenses of my company?
B. Fire all the employees who take high salaries.
A. But you know I'd rather go bankrupt instead of doing this.
B. I know but this is my opinion. In any case, I don't care. You can do whatever you want.

A second puzzle is how to derive performativity in imperatives. This is especially challenging for modal approaches to imperatives which are truth-conditional like the one developed here. As it has long been noticed we cannot judge an imperative as true or false. We can challenge an imperative as in (73a) but not directly target its truth or falsity with an expression like *This is not true/You are lying, etc.* (73b).

- (73) Invite Meli!
a. Wait a minute! I thought you don't want me to invite Meli.
b. #This is not true. / #You are lying. You don't want me to invite Meli.

In order to account for the performativity effect, I follow Kaufmann (2012, 2016) who argues that performativity of modal verbs such as *must* and the imperative should be treated in tandem and derived from the context they appear in. In particular a performative interpretation arises when i) a priority modal provides an answer to a Question under Discussion (QUD) that expresses a *decision problem*²² and ii) the speaker

²²According to Kaufmann (2012, 2016), a *decision problem* for an agent α is a set of non-overlapping propositions where each cell represents a future course of events that is choosable for α . Under Kaufmann's (2016) analysis, when there is a *decision problem* the context is practical. A *practical context* is an octuple of the form $\langle S, A, w, t, CS, \Pi, f, g \rangle$, where S = speaker, A = Addressee, w = world, t = utterance time, CS = Context Set and f is the modal base and g the ordering source. Π represents the QUD.

(i) A context c is practical for an agent α (written a-PRACTICAL(c)), iff

has epistemic authority over the issue. For example, an imperative such as *Eat the apple* can be understood as an answer to a decision problem in different ways, depending on the context, e.g. it could be that the addressee wants to eat something but he does not know what or he is not sure whether he is allowed to eat an apple. In this case, it is expected that the addressee will follow the advice provided for the decision problem, therefore resulting in the addressee taking action. What is crucial for the difference between typical deontic modals and imperatives is that imperatives presuppose (i) and (ii), therefore guaranteeing that they are always performative. Adapting Kaufmann (2012)'s analysis into the present analysis, we can integrate the requirement for a *practical context* as a presupposition, such that $mood_{IMP}$ is defined only if it occurs in a practical context.²³ Now that we have tackled the basic issues with the meaning of imperatives we turn to the analysis of imperatives which combine with an overt adverbial.

5.3 Oposdipote-imperatives

As we saw in Sect. 5.1, imperatives combining with *oposdipote* 'definitely' yield an unambiguously necessity reading. Given that *oposdipote* on its own is analysed as an adverbial conveying necessity, it is natural, under the present analysis, to analyse it as a quantificational operator which, upon merging with the imperative, binds the world variable and yields a universal reading.

In particular, *oposdipote* combines with a partial function from worlds to truth values and universally quantifies over the world variable. The domain condition in (74) guarantees that the worlds of evaluation will be the worlds of evaluation in p . This means that whatever restriction is introduced in the embedded proposition is projected in the entire proposition. Thus, when *oposdipote* combines with an imperative, $mood_{IMP}P$ as in (75), it universally quantifies over the world variable, and it ends up with the same domain restriction that imperative mood enforces by presupposing that the worlds of evaluation are consistent with the speaker's desires and the Epistemic Uncertainty Condition. The meaning we derive by combining *oposdipote* with the imperative proposition as in (76b) is *that in all worlds in which the speaker's desires*

-
- a. Πc is a decision problem for α , written Π_{α}^{Δ} , and
 - b. g_c represents a set of rules, preferences, or goals.
 - c. The salient modality in c is decisive, that is, CS entails that f_c, g_c characterize the modality relevant to resolve Π_{α}^{Δ} .

Condoravdi and Lauer's (2012) notion of *effective preferences* shares a similar intuition, that the speaker needs to prioritize over future possible actions. However the implementation is different since it is part of the definition of the imperative operator.

²³Given that the present paper focuses on the variable force of imperatives I will not go into details about the role of imperative mood in performativity. However, I would like to point out that the performativity puzzle seems to be more general than just the performativity in imperatives. In Greek all matrix sentences with non-indicative mood (i.e. subjunctive and imperative) are performative suggesting that there is a close connection between verbal mood and sentence mood. Investigating the two in tandem might be a fruitful path to understanding the performative character of imperatives (see Portner 2018b, 2016). It is possible for example that non-indicative mood always involves an *expressive* operator in the sense of Grosz (2012) such that the whole proposition cannot be characterized as true or false. Any hypothesis however should involve a detailed study of matrix non-indicative clauses which goes well beyond the scope of this paper.

with respect to the addressee's actions are satisfied, the prejacent is true as shown in (76c).

$$(74) \quad \llbracket \text{oposdipote} \rrbracket^c = \lambda p_{\langle st \rangle}. \forall w': w' \in \text{dom}(p). p(w') = 1$$

(75) Oposdipote fige!
definitely leave.IMP
'Definitely leave!'

- (76) a. [*oposdipote* [_{moodP} mood_{IMP} [_{TP} A leaves]]]
 b. $\llbracket \text{mood}_{\text{IMP}} [\text{A leave}] \rrbracket^c = \lambda w'$:
 $\frac{S_c \text{'s desires at } t_c \text{ in } w_c \text{ with respect to the } A_c \text{'s actions are satisfied}}{\text{in } w' \wedge \exists w_1, w_2 \in \text{Bel}'_{S_c}(w_c) [\neg A_c \text{ leaves in } w_1 \wedge A_c \text{ leaves in } w_2]}. A_c \text{ leaves in } w'.$
 c. $\llbracket \text{oposdipote} [\text{mood}_{\text{IMP}} [\text{A leave}]] \rrbracket^c = \forall w'$:
 $\frac{S_c \text{'s desires at } t_c \text{ in } w_c \text{ with respect to the } A_c \text{'s actions are satisfied}}{\text{in } w' \wedge \exists w_1, w_2 \in \text{Bel}'_{S_c}(w_c) [\neg A_c \text{ leaves in } w_1 \wedge A_c \text{ leaves in } w_2]}. A_c \text{ leaves in } w'.$

Under this analysis, *oposdipote* is treated as a quantificational adverbial quantifying over worlds. The domain restriction ensures that the worlds are restricted to those consistent with the speaker's desires as required by the semantic contribution of imperative mood.

5.4 *Kalitera*-imperatives

The adverbial *kalitera* 'better' involves a comparison between two alternatives, suggesting that one is better than the other. Formalizing this intuition, *kalitera* can be analysed as a comparative operator which takes two propositions, *p* and *q*, as its arguments and establishes a comparative relation between the two.²⁴ Notably, *kalitera* 'better' seems to have a modal flavor on its own, since it always gives rise to prioritizing modal interpretations. Therefore, I propose that a doxastic modal base *f* and a bouletic ordering source *g* is part of its meaning (cf. von Stechow 1999 for *want*). Otherwise, it would be expected that *kalitera* 'better' could be consistent with an epistemic interpretation (like *oposdipote*) which is never the case.

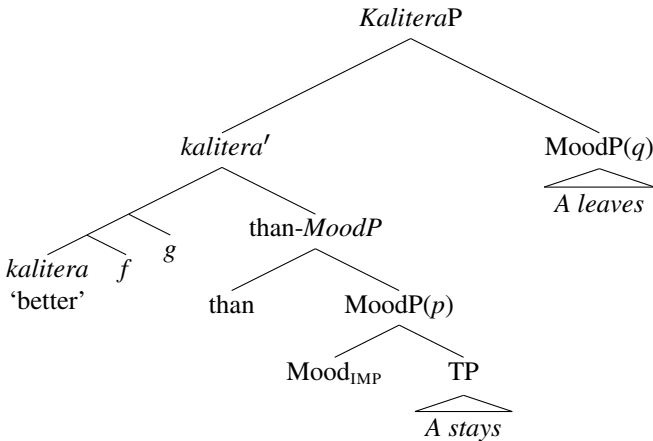
Syntactically, *kalitera*-imperatives involve two clauses. The *than*-clause is the internal argument of *kalitera* and it can be realized overtly as shown in (77), repeated

²⁴*Kalitera* can be analysed in different ways. One possibility would be to assume that it is derived compositionally from the degree adjective *kalos* 'good' combined with the comparative morpheme *-ter* '-er' which would take as its restrictor the *than*-proposition *p*, stating a relation between *p* and the main clause *q*. However, since an ordinary *kala* 'well' adverbial is not licensed cross-linguistically in such constructions, I follow a different path, treating *kalitera* as a non-compositional chunk. The meaning of *kalitera* follows the notion of comparative possibility in Kratzer (1981, 2012). Recent works on graded modality (Portner and Rubinstein 2016; Lassiter 2017; Herburger and Rubinstein 2018) highlight alternative ways to derive gradability in the modal domain. However, for this paper, I try to remain as close as possible to the Kratzerian view of modality focusing more on the ways quantificational force is defined in imperatives.

from (59), or covertly.²⁵ As shown in (78) *kalitera* combines with two *mood*_{IMP}*Ps*, which is evident from the fact that a morphological imperative can appear in the *than*-clause.

- (77) *Kalitera fige para mine.*
 better leave.IMP than stay.IMP
 ‘Better leave than stay.’

- (78) *kalitera*-imperatives



More formally, *kalitera* ‘better’ is analysed as a modal operator with a modal base *f* which restricts the accessible worlds to those consistent with the speaker’s doxastic state in the context world (*w_c*) and an ordering source *g* which imposes a ranking among these worlds, selecting the ones that are consistent with the speaker’s desires in *w_c* (i.e. *Best_{f,g,w_c}*). The operator compares two clausal alternatives *p* and *q* stating that there is a world *v* consistent with the speaker’s desires in which *q* is true and for all worlds *u* consistent with the speaker’s beliefs, in which *p* is true and *q* is false then *v* is ranked higher with respect to speaker’s desires compared to world *u*.

$$(79) \llbracket \text{kalitera} \rrbracket^c = \lambda f_{\langle st,t \rangle} \cdot \lambda g_{\langle st,t \rangle} \cdot \lambda p_{\langle st \rangle} \cdot \lambda q_{\langle st \rangle} \cdot \exists v.v \in \text{Best}_{f,g,w_c} [q(v)=1 \ \& \ \forall u. u \in \cap f_{w_c} [(p(u)=1 \ \& \ q(u)=0) \rightarrow u <_{g(w_c)} v]]$$

$$(80) \text{ a. } \llbracket \text{than-imp-A stays} \rrbracket^c = \lambda w':$$

$$\frac{S_c \text{ 'desires at } t_c \text{ in } w_c \text{ with respect to the } A_c \text{ 's actions are satisfied}}{\text{in } w' \wedge \exists w_1, w_2 \in \text{Bel}'_{S_c}(w_c) [\neg A_c \text{ stays in } w_1 \wedge A_c \text{ stays in } w_2].}$$

$$A_c \text{ stays in } w'.$$

²⁵The *than*-clause doesn’t have to be realized overtly. In a sentence like *Kalitera fige* ‘Better leave’ without an overt *than*-clause the comparison is again understood to be between leaving and staying. In the sentence in (82) the compared alternative is *dance with x*. One reviewer asks whether the embedding of an imperative form under the comparative *para* ‘than’ could be a metalinguistic effect, i.e. *Better STAY than LEAVE*. There is no prosodic marking that would indicate a metalinguistic use. In addition, speakers also accept longer sentences such as *Kalitera stiltu e-mail para parton telefono* ‘Better send him an email than call him on the phone,’ thus suggesting that we are not dealing with a case of metalinguistic use.

- b. $\llbracket \text{imp-}A \text{ leaves} \rrbracket^c = \lambda w':$

$$\frac{S_c \text{'s desires at } t_c \text{ in } w_c \text{ with respect to the } A_c \text{'s actions are satisfied}}{\text{in } w' \wedge \exists w_1, w_2 \in \text{Bel}'_{S_c}(w_c) [\neg A_c \text{ leaves in } w_1 \wedge A_c \text{ leaves in } w_2]}.}$$

$$A_c \text{ leaves in } w'.$$

Combining *kalitera* with the two imperative propositions *A-stays* and *A-leaves* (*para* ‘than’ is semantically vacuous), the meaning of which is given in (80), we derive the interpretation that there is at least one *Best*-world v in which the addressee leaves and for all worlds u in which the addressee stays (and doesn’t leave), v is ranked higher than u with respect to the speaker’s desires.

- (81) $\llbracket (77) \rrbracket^c = \exists v. v \in \text{Best}_{\text{Dox}, \text{Boul}, w_c} [A_c \text{ leaves in } v \ \& \ \forall u. u \in \cap \text{Dox}_{w_c} [A_c \text{ stays in } u \ \& \ \neg A_c \text{ leaves in } u] \rightarrow u <_{\text{Boul}(w_c)} v]$

Crucially, the presupposition restriction introduced by imperative mood which results in domain restriction for the relevant worlds of evaluation overlaps with the domain restriction asserted by the modal operator *kalitera*. Thus, the presupposition introduced by imperative mood is satisfied but it does not further contribute anything to the interpretation of *kalitera*-imperatives.

The meaning in (79) captures a variety of possibilities. It correctly predicts that cases in which both alternatives are true might be equally good (82a), better (82b) or worse (82c) compared with the worlds in which only the prejacent is true.

- (82) *Kalitera horepse me ton Petro para me ton Jani.*
 Better dance.IMP with the Peter than with the John.
 ‘You better dance with Peter than John.’
 a. But if you want, you can dance with both of them.
 b. Of course, if you can dance with both even better!
 c. But make sure you don’t dance with both of them.

Furthermore, the meaning in (79) captures the intuition that by uttering (82) the speaker does not say that he necessarily wants the addressee to dance with Peter. This is shown with the continuation in (83):

- (83) *Kalitera horepse me ton Petro ala akomi kalitera an den horepsis*
 Better dance.IMP with the Peter but even better if not dance.2SG
katholu.
 at-all
 ‘Better dance with Peter but it’s even better if you don’t dance at all.’

Therefore, although *kalitera*-imperatives convey the speaker’s preference between two alternatives they do not convey a strong preference since the meaning in (79) is consistent with the prejacent of *kalitera* being false in the *Best*-worlds. *Kalitera*-imperatives conclude the types of environments which suggest that imperatives cannot invariably convey necessity or possibility. By removing the quantificational force from the imperative form, we are able to capture the different interpretations which arise when the imperative merges with different adverbs, such as *kalitera* ‘better’ and *opodipote* ‘definitely’ in Greek. Now, we turn to stronger meanings of imperatives which emerge without the presence of an overt operator.

6 Strengthened readings of imperatives

Turning to plain imperatives again, the present analysis predicts that, in the absence of an overt operator, a possibility meaning is derived via existential closure. Under this view, we have to account for the stronger readings (i.e. *command/request*) which are very common especially in *out-of-the-blue* contexts. It is especially these *out-of-the-blue* environments which derive by default a *command/request* interpretation that has led grammarians throughout the years to associate imperatives with a strong ‘imperative’ meaning.

I show that this correlation between a *command/request* reading and an *out-of-the-blue* context, is explained once we consider what the focus alternatives are in these contexts. I present the mechanics for the derivation of the stronger interpretation, showing that it is derived as an implicature based on two conditions: i) the lack of a stronger counterpart and ii) exhaustification over certain focus alternatives.

6.1 Condition I: Lack of a stronger scalar counterpart

It has long been observed that a sentence with an overt possibility modal as in (84) resists a stronger universal inference. This is due to the derived scalar implicature considering the fact that the speaker did not use the stronger scalar counterpart of *can*, the universal modal *must*.

(84) You can open the door. \rightsquigarrow You must open the door.

The exact mechanism for the derivation of the implicature depends on the theory one follows. For now, it is not important whether one favors a pragmatic (neo-Gricean) (Sauerland 2004; van Rooij and Schulz 2004; Spector 2007; Chemla 2008) or a grammatical (Chierchia 2006, 2013; Fox 2007; Chierchia et al. 2009, 2012) view for the derivation of scalar implicatures. For ease of exposition I stick to the grammatical approach as outlined in Chierchia et al. (2009).

Under this approach, there is an Exhaustivity operator (EXH) that negates the alternatives and is responsible for the generation of the implicature. The EXH-operator states that the proposition S is true and that the only members of ALT that are true are those entailed by S (Chierchia et al. 2009, 4). The formal definition is given in (85):

(85) $[\text{EXH}_{ALT}(S)]^w = 1$ iff $[S]^w = 1$ and $\forall \phi \in ALT (\phi(w) = 1 \rightarrow ([S] \subseteq \phi))$

The alternatives, in the case of the example in (84), will be the propositions derived by substituting *can* with its Horn scale-mate *must* (Horn 1972). By applying EXH to the alternatives, we derive the implicature that *it’s not the case that you must open the door*.

Now the question is why imperatives, since they are also analysed as expressing possibility, do not give rise to a similar implicature. The notion of scalar implicature relies on the existence of lexical scalar alternatives. Since the possibility reading in imperatives is derived via existential closure, there is no actual lexical modal to substitute. The absence of scalar alternatives in this case is what prevents the derivation of an implicature along the lines in (84). This in turn licenses the emergence of a stronger interpretation. The idea that in the absence of scalar alternatives, stronger

meanings can be derived, therefore giving rise to variable quantificational force is not new. In the domain of modality, Deal (2011) suggests that modal suffixes in Nez Perce are existential in character but they are not part of the Horn Scale, i.e. they do not have a stronger counterpart (cf. Rullmann et al. 2008). According to Deal (2011), the absence of an implicature is a key-point in explaining why these suffixes can be used in contexts where a universal modal could appear. This idea has been employed in explaining other instances of quantifiers with apparently ambiguous force (Bar-Lev and Margulis 2013; Meyer 2013, 2016; Bowler 2014; Bassi and Bar-Lev 2016a).

6.2 The importance of focus alternatives

So far, we have seen that the lack of a stronger scalar counterpart licenses a stronger interpretation. Now the question is to define the conditions which favor a weak and a strong interpretation respectively. I argue that the critical factor is the placement of focus which leads to the derivation of certain strengthening implicatures based on the relevant focus alternatives. A pure acquiescence interpretation survives when there are no relevant focus alternatives to consider, i.e. when there is the so-called *verum focus* realized with a Nuclear Pitch Accent (NPA) on the verb followed by deaccenting as illustrated in (86).²⁶ This can be understood as permission in a context in which it is clear that the addressee is feeling warm, or just as an invitation to the addressee.

- (86) ANIKSE to parathiro.
 open.IMP the window
 ‘Open the window.’

The meaning we derive for this sentence is that *there is a world w' consistent with the Speaker's desires in c and the Addressee opens the window in w' .*

What we call *verum focus*, i.e. the pattern in which the verb or an auxiliary receives the NPA, has been analysed in different ways. Under one view, *verum focus* is analysed as a focus accent which always yields only two alternatives, the assertion and its negated counterpart (an analysis attributed to Höhle 1992 by Gutzmann et al. 2017). More recently Gutzmann et al. (2017) analyse *verum focus* as a special prosodic-marking associated with a particular not-at-issue meaning, characterized as a felicity condition. According to Gutzmann et al. (2017) *verum focus* on a proposition p , is felicitous if the Question Under Discussion, is whether p or *not p* :

- (87) $\llbracket \text{VERUM} \rrbracket^{u,c}(p) = \checkmark$, if p , $\neg p = \text{QUD}(c)$

²⁶As a reviewer points out, NPA on the verb can be interpreted in different ways. When there is no particular context, the default option is to interpret it as a case of *verum focus*. However, it can also be interpreted as narrow focus on the lexical verb, i.e. in a context in which the addressee didn't hear well and he attempts to fully close the window, the speaker can repeat ANIKSE to parathiro 'OPEN the window' as opposed to the alternative *Close the window*. Another option is to interpret the NPA on a particular functional component of the verb, i.e. aspectual distinctions. However, all of these interpretations require a particular context that is either corrective or makes the alternatives very salient. For more detailed discussion see Oikonomou (2016: 78–79).

Under either approach to verum focus, we can see why *permission*-imperatives are verum-focus. Under the first hypothesis, verum focus should be analysed as F-marking on the covert imperative operator and therefore, the only alternative ($\neg\exists[mood_{IMP} p]$) would contradict the meaning of the imperative, thus excluding a stronger reading. Under Gutzmann et al.'s (2017) analysis, verum focus is not F-marking, therefore there are no alternatives to exhaustify over. The felicity condition they posit fits exactly the intuitions expressed in the literature regarding the environments in which a permission reading arises (i.e. when there is a countervailing prohibition of p or when it is not known *whether p is allowed or not*).

For the derivation of a stronger interpretation a different focus pattern is required. In particular, a necessity interpretation arises when the alternatives involve the negation of the prejacent alone. This happens when the prejacent p is broadly focused, realized with a NPA on the last stressed syllable as illustrated in (88). Following Rooth (1992), the alternatives of p can be any proposition of type $\langle st \rangle$ derived by substituting the focused phrase. As we noticed above, a strong imperative with *oposdipote* 'definitely' cannot be an alternative. Since there is no lexical item bringing in existential force but rather just an operation of existential closure, we cannot apply lexical substitution, therefore the possibility of a stronger *must*-alternative is excluded. Thus, when an imperative is broadly focused, the negation of the prejacent p is taken to be a contextual salient alternative. This not only allows us to derive the right meaning for strong imperatives but it also captures the intuition that in out-of-the-blue contexts an imperative expresses a preference between p and $\neg p$ (cf. Starr 2011).²⁷ Thus, when an imperative $[\exists mood_{IMP} p]$ is uttered in an *out-of-the-blue* context the only relevant alternative is the one that involves the negation of the prejacent p $[\exists mood_{IMP} \neg p]$, thus deriving the alternatives in (90) for an imperative sentence like 'Open the window':²⁸

(88) Anikse to PARATHIRO.
 open.IMP the window.
 'Open the window.'

(89) $[[\text{(88)}]]^c = \exists w': S_c$'s desires in w_c with respect to the A_c 's actions are satisfied in w' . A_c opens wnd in w' .

(90) $[[\text{(88)}]]^{c,F} =$
 $\left\{ \begin{array}{l} \exists w' \in W: S_c$'s desires in w_c satisfied in $w' \wedge A_c$ opens wnd in w' \\ \exists w' \in W_c: S's desires in w_c satisfied in $w' \wedge \neg[A_c$ opens wnd in w'] \end{array} \right\}

The focus alternatives are then evaluated by the EXH-operator, introduced above, and all non-weaker alternatives are negated, thus deriving the implicature in (91):

²⁷Fox and Katzir (2011) suggest a theory for the computation of alternatives which does not allow alternatives which are structurally more complex than their prejacent. Clearly, the negation of a proposition p is structurally more complex than p . Fox and Katzir's analysis provides a way out of this problem. In the definition for the calculation of alternatives, Fox and Katzir allow more complex alternatives as long as they are imposed by the context as relevant alternatives.

²⁸A different issue concerns the nature of alternatives. Namely, a reviewer raises the possibility that the entire proposition with the existential operator is negated. This, however, would be a case of verum focus realized with a Nuclear Pitch Accent on the verb and yielding a possibility reading since the only alternative contradicts the assertion. These are the permission cases I discussed above.

(91) $\neg \exists w' \in W: S_c$'s desires in w_c are satisfied in $w' \wedge \neg[A_c$ opens wnd in w']

By exhaustifying the alternatives the interpretation is that *there is no world that is compatible with the speaker's desires in which the addressee does not open the window*. This is equivalent to saying that *the addressee must open the window*, thus capturing the strong-reading of the imperatives when they are intended as *commands, requests, strong advice, etc.*²⁹

The reader can see now how the strengthening mechanism presented in this paper mirrors the weakening mechanism proposed by Kaufmann in Schwager (2005, 2006). For Kaufmann, the imperative operator is a universal modal composed from an existential modal and an exhaustifier. In certain contexts (e.g. *for-example-advice*) the exhaustive operator is removed resulting in a possibility meaning. Under the present analysis, plain imperatives involve just a possibility modal. Exhaustification applies in certain environments upon the emergence of alternatives. There is nothing special to be said about this exhaustification mechanism because it is a mechanism that is independently available for the derivation of implicatures in general.³⁰

Under the present analysis prosodic marking plays a key role in the interpretation of imperatives. When the preadjacent is broadly focused realized with a NPA on the last word, a necessity interpretation arises, while when there is *verum focus*, realized with a NPA on the verb a permission interpretation prevails. In Appendix B, a comprehension pilot study with 23 participants shows that speakers are sensitive to the prosodic marking. The task involved listening to an imperative sentence which had either the NPA on the verb or on the last word and deciding whether the imperative conveyed possibility or requirement. We found a significant difference based on the prosody. When the NPA was on the verb, participants classified it as permission 71% of the times and only 29% of the times as requirement. By contrast, when the NPA was on the last stressed syllable participants classified it as requirement 68% of the times and only 32% of the times as permission.³¹

Other prosodic patterns, such as narrow focus on a constituent can have either a permissive or a directive interpretation depending on the context. For example, the imperative in (92) with narrow focus on *vanilla* provides permission to the child to eat vanilla ice-cream but it also conveys a prohibition against eating other ice-

²⁹ A reviewer asks how the differences between *command* and *request* can be derived. My suggestion is that a *command* differs from a *request* not in its force, but rather in the authority relations between the interlocutors, the politeness level, etc. It is also possible that in the same dialogue, something starts as a *command* and is repeated as a *request* or vice versa. i.e. originally you order your roommate to open the window, but as he denies you start requesting more politely. Or a doctor in a hospital room may originally make a polite request to open the window, but if her request is not fulfilled she can give an order. Similarly, the same utterance can start as a strong advice, i.e. *wash your hands before eating* and turn to a *command* if the addressee does not follow the advice.

³⁰ A reviewer asks if we expect a cost of implicature since this has been noticed for other types of implicatures such as *some* -> *not all* implicature. However, there are also implicatures for which it has been noticed that there is no cost in their computation. Singh (2019) argues that the cost in implicature computation is related with *the semantic complexity of the chosen meaning and how much relevant uncertainty it leaves behind in the context*. If these are indeed the relevant metrics we would not expect the strengthened interpretation of imperatives to yield any processing cost patterning with the strengthening of disjunction to a conjunctive meaning. Experimental research can further inform us about this question.

³¹ I am extremely grateful to Onur Oşzoy for plotting and discussing the results from the study with me.

cream flavors (e.g. chocolate ice-cream). This is derived by negating all non-asserted alternatives in (94), yielding the implicature in (95).

- (92) Endaksi... Fae VANILJA pagoto... An ke den kani na tros
 O.k... Eat VANILLA ice-cream... If and, not allowed SUBJ eat.2SG
 pagoto tetja ora...
 ice-cream such time
 ‘O.k... Eat VANILLA ice-cream... Even though, you shouldn’t eat ice-cream so late...’.

- (93) $[(92)]^c = \exists w': S_c$ ’s desires in w_c with respect to the A_c ’s actions are satisfied in w' . A_c eats vanilla ice-cream in w' .

- (94) $[(92)]^{c,F} =$

$$\left\{ \begin{array}{l} \exists w' \in W: S_c$$
’s desires in w_c satisfied in $w' \wedge A_c$ eats van-ice in w'
 $\exists w' \in W_c: S$ ’s desires in w_c satisfied in $w' \wedge A_c$ eats choco-ice in w'
 $\exists w' \in W_c: S$ ’s desires in w_c satisfied in $w' \wedge A_c$ eats hazel-ice in w' \end{array} \right\}

- (95) $\neg \exists w' \in W: S_c$ ’s desires in w_c are satisfied in $w' \wedge A_c$ eats cho/hazel-ice in w'

In (96), where it is already established that a window must be opened, the imperative clause conveys that *A can open the front window but not the back window*.

- (96) Anikse to BROSTINO parathiro.
 Open the FRONT window.

Crucially, in addition to focus marking, there are additional prosodic cues which the speakers use in order to disambiguate an imperative, presenting a field for future exploration. Our understanding of the role of intonation in the interpretation of imperatives is still very preliminary. Recent experimental work by Jeong and Condoravdi (2018a,b) shows that there are different prosodic cues which affect the interpretation imperatives. For instance in Jeong and Condoravdi (2018b), they show that the so called *calling contour*, which has been transcribed as H* !H-L% in English, indicates that the speaker has a reason to publicly signal that she does not have further action-relevant control over the realization of the content of the imperative (Jeong and Condoravdi 2018b: 216).

The proposed analysis highlights the role of the focus in the interpretation of imperatives. This does not exclude the possibility that other elements play major role too. As Jeong and Condoravdi (2018a,b) point out it seems that imperatives do not have a distinct prosodic pattern, we simply employ general prosodic cues which are available in language in order to differentiate between different types of imperatives.

7 Concluding remarks and further questions

The present paper examines imperatives in different environments showing that we cannot account for their interpretation assuming an all-universal or an all-existential analysis or even an ambiguity analysis. Scope facts with *mono* ‘only’ and *akomi ke* ‘even’ suggest an existential analysis whereas the stronger meanings that we get when

imperatives combine with *kalitera* ‘better’ or *oposdipote* ‘definitely’ in Greek suggest otherwise. Given this apparently “conflicting” evidence, I analyse imperatives as mood-Phrases with an imperative mood feature (IMP), without a modal operator. The modal interpretation arises in the course of the derivation due to the presupposition contributed by imperative mood, restricting the reference of the world term to worlds consistent with the speaker’s desires.

In the absence of an overt operator, existential closure applies deriving a possibility meaning for imperatives. Under this view, we can explain how the stronger readings are derived in plain imperatives. Since, there is no lexical modal at first place, there is no scalar implicature of the *can-must* type, that will prevent the derivation of a stronger meaning. A stronger interpretation is derived as an implicature by exhausting over focus alternatives. In the case of broadly focused imperatives uttered in *out-of-the-blue* contexts, the only contextually salient alternative is the negation of the prejacent. In this way, by negating a possibility embedding negation ($\neg \diamond \neg$), we end up with a necessity interpretation.

On the other hand, stronger readings of imperatives in the presence of the adverbials *kalitera/better* and *oposdipote* ‘definitely’ cannot be derived as implicatures, since they are independent of the prosodic pattern of the clause and they are unambiguous irrespective of the environment they appear in. The ‘minimal-modalized’ analysis allows us to treat *oposdipote* as a universal operator which quantifies over the world variable and *better/kalitera* as a comparative operator.

Overall, the analysis developed in this paper combines elements from a modal and a minimal approach, in that it treats the imperative as modalless but eventually it ends up with a modal interpretation. In addition, it differentiates between the strong readings of plain imperatives, treating them as implicatures, versus strong readings which emerge in the presence of certain adverbials which are responsible for the stronger meaning. It still remains an open question how non-canonical uses of imperatives (e.g. Imperative and Declarative constructions (IaDs) conveying a conditional interpretation and imperative forms which in Greek, Turkish and other languages convey difficulty; Demirok and Oikonomou 2018) can be analysed. Although the imperative does not involve a modal operator, the present analysis still associates the *imperative mood* with *prioritizing semantics* via the presupposition contributed by IMP. Thus, in order to explain the aforementioned patterns we would need to postulate that the presupposition is not triggered in these environments (but see Keshet and Medeiros 2019). For now this sounds stipulative and further work is necessary in order to provide an explanation for these patterns.

In addition, it remains an open question whether all constructions that are cross-linguistically characterized as imperatives have uniform behavior. First, as von Stechow and Iatridou (2017) notice not all imperative constructions have the same range of acquiescence readings. In addition, it is possible that two forms with directive function differ in their properties even within the same language, as it is the case for imperatives and matrix subjunctives in Greek. That said, the present account provides an analysis for the variable force of imperative constructions in Greek and it is extendable to English as illustrated by Francis (2019). I also showed that the scope facts in Serbian and Hungarian support a similar analysis. However, further cross-linguistic evidence is necessary to make any further conclusions regarding the generality of the current proposal.

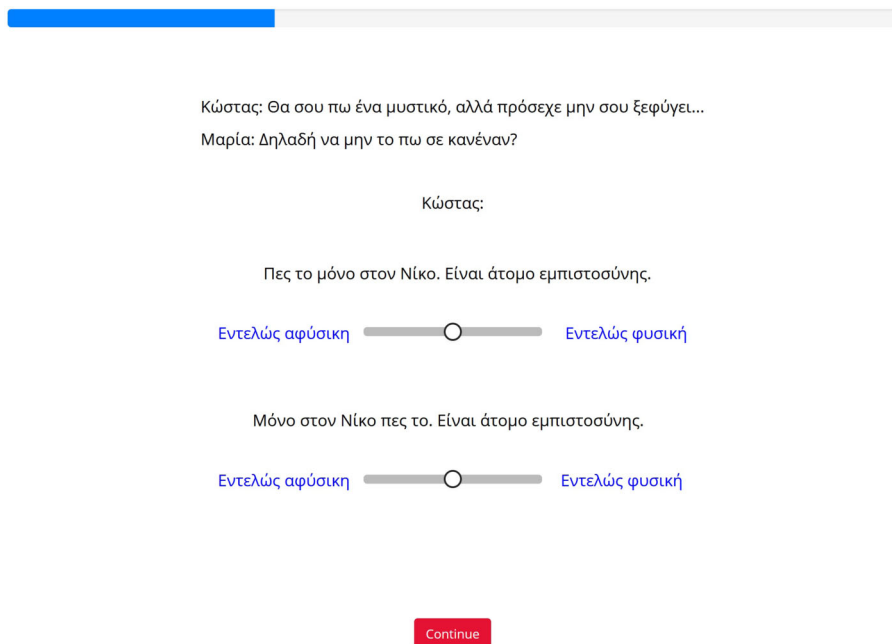


Fig. 1 Example trial

Finally, the idea that in the absence of an overt operator, existential closure applies is possibly extendable to other cases of covert modality. For instance, dispositional middles have been shown to have an existential meaning which could be derived in a similar way (see Menendez-Benito 2005). Another instance of covert modality is the conditionals. Herburger (2015) and Bassi and Bar-Lev (2016b) provide arguments in favor of an existential analysis. If this is true, we can formulate a hypothesis that in the absence of an overt modal operator, existential closure applies in modal environments deriving a possibility interpretation which can be strengthened to express necessity. Several patterns of covert modality crosslinguistically have variable force depending on the environment they appear in, making it worth-investigating a hypothesis.

Appendix A: A pilot study comparing fronted and in-situ *only* in Greek imperatives

In this Appendix, I present the results of a small scale study, which aims at addressing a reviewer’s question about the effect of focus fronting of the *only*-phrase in imperatives. The study consists of 10 trials (1 item was excluded because of a mistake, and one item was constructed with *oposdipote* for which we found no difference between fronted and non-fronted *only* in a permissive context, as we expected) in which the participants read a context followed by two imperative clauses: one with fronted *only* and the other with in situ *only*. The order of the two sentences were mixed throughout the study. Figure 1 provides an example of a trial. The participants had to rate sepa-

rately each clause in the given context in a scale from 0 (=entirely unnatural) to 100 (=entirely natural).

The context either facilitated a prohibitive interpretation (4 trials) or a permissive interpretation (6 trials). In 3 out of the 6 trials with permissive interpretation, the imperative sentences included an *at-least* element (*tulahiston* or *esto*) which enforces a permissive reading and which was suggested by one reviewer to result in greater acceptability of the imperatives with fronted *only* in permissive contexts. The study was implemented on Gorilla (Anwyl-Irvine et al. 2018). 27 native Greek speakers were recruited.

Due to the small size of the study and the differences between the items, I find it more useful to represent the mean rating per sentence. The contexts are classified into Prohibition (A.1), Permission (A.2) and Enforced permission (A.2), which included the *at-least* elements enforcing a permissive interpretation. I present the Greek sentences and, in italics, the translation in English. I also show the moved *only*-phrase in the English translation to make the difference clear between the two examples.

The expectation based on the observations in Sect. 3.1.1, is that in Prohibition contexts both variants will be equally natural, whereas in Permission contexts the fronted *only* should be unnatural. The effect should be stronger when there is an *at-least* element like *tulahiston* ‘at least’ enforcing a permissive interpretation. Below, the participants answers are in the expected direction. In addition, we notice that overall sentences with fronted *only* receive lower ratings.

A.1 Prohibition

- (97) Kostas: Perase i ora! Na ksipniso ta pedja!
Kostas: Time passed! I should wake up the kids.
- a. *Only* > *imp* = **95.59%**
 Maria: Mono ton Antoni ksipna. O Nikos duleve mehri arga htes.
Maria: Only Antonis wake up. Nick worked until late yesterday.
 - b. *imp* > *only* = **84.62%**
 Maria: Ksipna mono to Antoni. O Nikos duleve mehri arga htes.
Maria: Wake up only Antonis. Nick worked until late yesterday.
- (98) O Orestis eksigi se enan simfititi tu: “Aftos o kathigitis ine poli periergos! Den theli na diavazume tipota alo ektos apo tis simiosis tu.”
Orestis explains to a peer: “This professor is very strange. He doesn’t want us to read anything else except for his notes.”
- a. *Only* > *imp* = **79.18%**
 Orestis: Mono tis simiosis diavase.
Orestis: Only the notes read.
 - b. *imp* > *only* = **94.55%**
 Orestis: Diavase mono tis simiosis.
Orestis: Read only the notes.
- (99) Gianis: Simera eho oreksi gia dulia! Tha vapso ta trapezia.
Gianis: Today I’m in the mood for work! I’ll paint the tables.

- a. *Only* > *imp* = **74.03%**
 Eleni: Mono to strogilo trapezi vapse. Ta ala thelun katharisma prota.
Eleni: Only the round table paint. The others need cleaning first.
- b. *imp* > *only* = **97.18%**
 Eleni: Vapse mono to strogilo trapezi. Ta ala thelun katharisma prota.
Eleni: Paint only the round table. The others need cleaning first.
- (100) Kostas: Tha su po ena mistiko ala prosehe mi su ksefigi.
 Maria: Diladi na min to po se kanena?
Kostas: I'll tell you a secret but be careful to not spill the beans.
Maria: So, I shouldn't tell anybody?
- a. *Only* > *imp* = **80.70%**
 Kostas: Mono ston Niko pes to. Ine atomo embistosinis.
Kostas: Only Nick tell. He's a trusted person.
- b. *imp* > *only* = **88.74%**
 Kostas: Pes to mono ston Niko. Ine atomo embistosinis.
Kostas: Tell only Nick. He's a trusted person.

A.2 Permission

- (101) I Lina eksigi se enan simfititi tis: "Aftos o kathigitis vazii poles erotisis apo ta vivlia ke ine diskoles... Ala afu variese... ti na po...
Lina explains to a peer: "This professor chooses many questions from the books and they are difficult... But since you are bored... What can I say..."
- a. *Only* > *imp* = **68.07%**
 Orestis: Mono tis simiosis diavase.
Orestis: Only the notes read.
- b. *imp* > *only* = **93.18%**
 Orestis: Diavase mono tis simiosis.
Orestis: Read only the notes.
- (102) Sakis: Ta trapezia hriazontai vapsimo...
 Kostas: Re si ime poli kurasmemos, den tin palevo...
Sakis: The tables need painting...
Kostas: Well, I'm very tired, I don't think I can make it...
- a. *Only* > *imp* = **63.96%**
 Sakis: Mono to strogilo trapezi vapse.
Sakis: Only the round table paint.
- b. *imp* > *only* = **88.48%**
 Sakis: Vapse mono to strogilo trapezi.
Sakis: Paint only the round table.
- (103) Liza: Na kalesis ke tus sinadelfus su sti dulia...
 Fotis: Den thelo kanenan...Mu spane ta nevra...
Liza: You should invite your colleagues from work too...
Fotis: I don't want anybody... They break my nerves...

- a. *Only* > *imp* = **69.33%**
 Liza: Mono ton Petro kalese.
Liza: Only the Peter invite.
- b. *imp* > *only* = **91.22%**
 Liza: Kalese mono ton Petro.
Liza: Mono ton Petro kalese.

A.3 Enforced permission with *at-least* element

- (104) Litsa: Prepi na plinume ta balkonia ke na katharisume to spiti, prin erthun i episkepsis...
 Maria: Den eho poli oreksi gia dulies...
Litsa: We have to wash the balconies and clean the house, before our visitors come...
Maria: I'm not in the mood for housework...
- a. *Only* > *imp* = **46.07%**
 Litsa: E, mono to balkoni pline tulahiston.
Litsa: E, the balcony wash at least.
- b. *imp* > *only* = **88.92%**
 Litsa: E, pline mono to balkoni tulahiston.
Litsa: E, wash only the balcony at least.
- (105) Kostas: Zesti kani...
 Maria: Den thelo na anikso ta parathira, ehi fasaria...
 Kostas: Ne ala den anteho...
Kostas: It's hot...
Maria: I don't want to open the windows, there is noise...
Kostas: Yes, but I can't bear the heat..
- a. *Only* > *imp* = **44.03%**
 Kostas: Mono to parathiro tis kuzinas anikse tulahiston...
kostas: Only the window of the kitchen open at-least.
- b. *imp* > *only* = **87.48%**
 Kostas: Anikse mono to parathiro tis kuzinas tulahiston.
Kostas: Open only the window of the kitchen at-least.
- (106) Kostas: Eho ena provlima ala den thelo na to po se kanenan...
 Maria: Ki omos... prepi na to mirastis...na paris diaforetikes gnomes...
Kostas: I have a problem but I don't want to tell anybody...
Maria: But you have to share it with others... You should take different opinions...
- a. *Only* > *imp* = **48.70%**
 Maria: Mono ston Niko pes to esto.
Maria: Only to-the Nick say it at-least.
- b. *imp* > *only* = **79.07%**
 Maria: Pes to mono ston Niko esto.
Maria: Say it only to-the Nick at-least.

A.4 Discussion

Overall, there is a preference for the in-situ *only* over the fronted *only*. This can be explained since the fronted order is more marked. However we notice that in prohibition contexts the rating of the fronted *only*-sentences is much closer to the in-situ (Mean rating: fronted: 82.37%, in-situ: 91.27%) than in the case of permissive contexts which do not involve an *at-least* element (Mean rating: fronted: 67.12%, in-situ: 90.66%). To some extent the relevantly high rating of fronted *only* in permissive contexts can be attributed to the fact that once the speaker adopts the addressee's priorities, the context can be seen as prohibitive, as we discussed in Sect. 3.1.1. This hypothesis is corroborated by the fact that once an adverbial enforcing permission is added the fronted sentences receive even lower rating in all cases less than 50% (Mean rating: fronted: 46.26%, in-situ: 85.15%).

Looking through the individuals responses, 4 out of 27 speakers rated all sentences with 100%. We also find a considerable number of speakers who rate most variants with a fronted *only* in the permissive context below 40%. From this study, I cannot tell what causes this variation among speakers. One idea, pointed out by a reviewer, is that some speakers always accept both scope configurations. It would be interesting to test if these speakers are also more permissive in their scope assignment with overt modals too. Certainly, this study indicates the need for further research in order to investigate scope interaction with *only* and the potentially variable behavior of the speakers. Despite this variation however, this small-case study confirms the original intuition that fronting *only* yields a prohibitive interpretation for the majority of the speakers, which is clearly not consistent with an *at-least* element indicating permission.

Appendix B: A pilot perception study investigating the role of prosody in Greek imperatives

This Appendix is added to address a reviewer's question on the role of prosody. I present a perception study which investigates the correlation between the prosodic pattern of imperatives and their interpretation in Greek.

B.5 Design and materials

The participants were asked to hear an imperative clause and decide whether it expresses that something is *allowed* (*epitrepete*) or *must* (*prepi*) be done. The participants were particularly instructed to decide depending on *how the sentence sounds*.

The imperative sentences were recorded by a native Greek speaker who was instructed to utter as naturally as she could the imperative sentences in a possibility and a requirement context. The sentences were annotated following the Greek ToBi system (Arvaniti and Baltazani 2000, 2005; Baltazani 2002) in Praat software to ensure that they had the predicted pattern, i.e. a Nuclear Pitch Accent (NPA) on the verb in the permissive contexts and Broad Focus in the requirement context. The permission contexts produced the expected pattern with a NPA on the verb, followed by deaccenting as illustrated for (107) in Fig. 2. The requirement context gave rise to two

Fig. 2 Permission: NPA on the verb

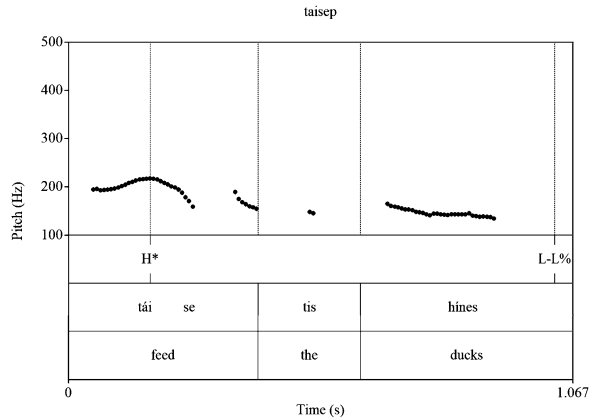
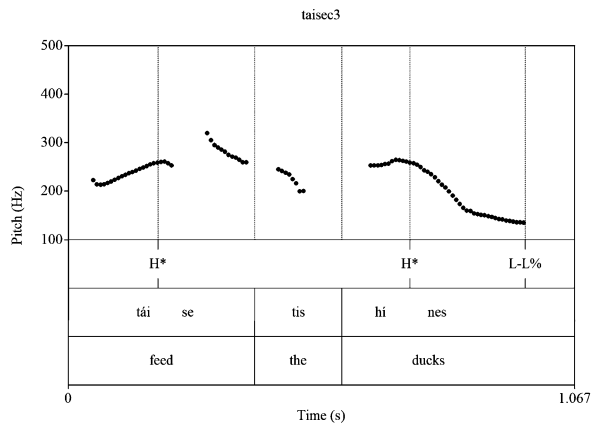


Fig. 3 Command: NPA on the right edge, L-L%



distinct patterns which were both included in the study. In both patterns the NPA was on the last stressed syllable. However, in one case there was a low boundary tone (L-L%) in the end as illustrated in Fig. 3, while in the other case, which sounded like a strong command, there was a low NPA L* followed by a L-H% boundary tone in the end as shown in Fig. 4. The full list of the imperative sentences is given in the end of the appendix.

- (107) Táise tis hínes.
Feed.IMP the geese

Feed the geese.

These three patterns were tested as three different conditions.

- (108) Conditions
- i. NPA on the verb (permission)
 - ii. NPA on the right edge (command/advice)
 - iii. L-H% boundary tone (Strong command)

Fig. 4 Command: NPA on the right edge, L-H%

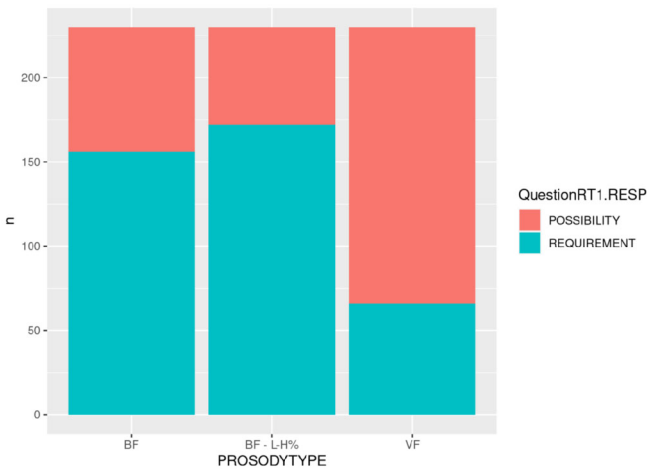
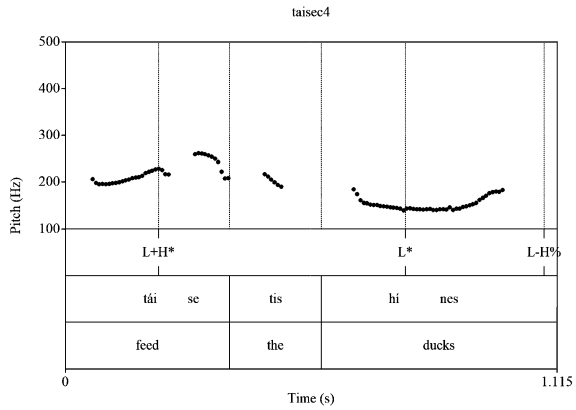


Fig. 5 Response (%possibility vs. %requirement) is shown on the y axis. The three conditions, based on the prosody type, are on the x-axis

There were 10 items per condition, thus 30 items in total. Sometimes the same imperative appeared in all three conditions and sometimes the same imperative appeared only in two conditions. We also had 34 filler items with overt modal expressions which would either involve a possibility or a necessity modal expression. In the beginning there were four practice trials for familiarization with the experimental set up. The experiment was designed using the 2nd version of E-Prime professional software (Schneider et al. 2002). 23 participants (who confirmed that at the time of the study they had spent less than five years abroad) participated in the experiment, and were recruited in the area of Berlin and Athens.

B.6 Perception study: Results

In Fig. 5, we present the results from 23 speakers. Table 1 presents the mean response per prosody type. We see that NPA on the verb (labelled VF) leads to 71% of possi-

Table 1 Mean response per prosody-type

	VF	BF-LH%	BF
POSSIBILITY	71%	25%	32%
REQUIREMENT	29%	75%	68%

bility answers and 29% of requirement. On the contrary, with the other two prosodic patterns in which NPA falls in the last stressed syllable (i.e. Broad focus with a rising boundary tone (BF-LH%) and Broad Focus with a falling boundary tone (BF)) the majority of the answers classify the imperative as requirement as opposed to possibility. The difference between NPA on the verb and NPA on the right edge is significant.

B.7 Discussion

The results of the study lend support to the hypothesis that prosody, and more specifically focus, plays a key role in the interpretation of imperatives. Looking at individual responses we do not observe large participant variation. However, there is some item variation. In some cases when the content of the sentence strongly favors permission or command reading the speakers go for the contextual salient interpretation (e.g. *marinate the salmon* is mostly interpreted as a command). Further research is needed to figure out how further prosodic cues, beyond focus, can affect interpretation.

B.8 Items

(109)	Imperative	Prosodic pattern:	VF	BF	BF-LH%
a.	Agorase ena kapelo. Buy a hat.		✓	✗	✓
b.	Pekse me to playstation. Play with playstation.		✓	✗	✓
c.	Taise tes. Feed them.		✓	✓	✓
d.	Pare to podilato. Take the bicycle.		✓	✓	✗
e.	Haidepse to skilaki. Pet the dog.		✓	✓	✗
f.	Anikse to. Open it		✓	✓	✓
g.	Marinare to solomo. Marinate the salmon.		✓	✓	✗
h.	Telefonise tu. Call him.		✓	✓	✓
i.	Katharise to. Clean it.		✓	✓	✓
j.	Forese to. Wear it.		✗	✓	✓
k.	S'afto to parti kalese ton Iliia. In this party, invite Ilias.		✓	✗	✓
l.	Ipgrapse to. Sign it.		✗	✓	✓
m.	Voithise ton. Help him.		✗	✓	✓

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