Abstract
In this paper, I consider the lexical parameters determining mood choice in Greek. The main questions to be addressed are: In what sense is the subjunctive dependent in main and embedded clauses? What is the meaning of the subjunctive itself, and how is this meaning compatible with the lexical property that licenses the subjunctive? In examining these questions we look at the patterns of mood choice in embedded clauses and adjuncts such as prin “before” and xoris ‘without’, as well as what appears to be non-canonical “triggering” of the subjunctive, e.g. in relative clauses, and in the so-called polarity subjunctive after negation and other polarity contexts. I propose that nonveridicality allows us to capture both selection and triggering as lexical sensitivity to nonveridicality. Building on Giannakidou 2009 I further argue that we can explain the dependency of the subjunctive to nonveridicality if we assume that its tense is non-deictic, i.e. it cannot make reference to a contextually specified time, which is what ‘regular’ tenses normally do.

1 What is grammatical mood?

The study of grammatical mood has a venerable tradition. In the study of classical languages, i.e. Ancient Greek and Latin, we talk about a number of moods: indicative, subjunctive, optative, imperative, at least— and these appear in main as well as embedded clauses. The indicative is typically the mood of assertions, and in this sense it is thought of as the “default” mood. Subjunctives can appear in main as well as embedded clauses, but the optative and the
imperative resist embedding.\textsuperscript{1} In Modern Indo-European languages, the central mood opposition when it comes to main \textit{and} embedded clause is the one between subjunctive and subjunctive, and this will be the main focus of the paper.\textsuperscript{2}

The formal marking of mood can be a little piece of morphology on the verb, as illustrated below with French, and Greek examples:

\begin{enumerate}
\item a. Marc \textit{croit} que le printemps \textit{est}/*\textit{soit} arrive. (French)
\begin{quote}
‘Marc believes that spring has-IND arrived.’
\end{quote}

b. Marc \textit{veut} que le printemps \textit{soit}/*\textit{est} long.
\begin{quote}
‘Marc wants that the spring be-SUB long.’
\end{quote}
\item Pes \textit{say.IMP.2sg} to. it
\begin{quote}
‘Say it.’
\end{quote}
\end{enumerate}

A designated mood form is used in French and Greek to formally mark the verb as indicative, subjunctive, or imperative. After a verb like \textit{croir} ‘believe’, the indicative must follow, and after a volitional verb like \textit{vouloir} ‘want’ the subjunctive must follow, we can thus describe the choice as selection. English too has a verb form ‘subjunctive’ following a directive verb like \textit{require}:

\begin{enumerate}
\item a. The Dean \textbf{believes} that we \textit{were}/*\textit{be} on time.
\item b. The Dean \textbf{requires} that we \textit{be}/*\textit{are} on time.
\end{enumerate}

Yet the use of subjunctive \textit{be} is not obligatory, as we see, so it is not so much a case of selection in English, but rather compatibility or triggering. Also, \textit{be} is not an exclusively subjunctive form:

\begin{enumerate}
\item But see Bostjan Dvorák, Ilse Zimmermann 2007 for embedded imperatives in Slovenian. I will not discuss the imperative in this paper.
\item It is important to mention here that the “subjunctive” has been used as a label for uses such as, for instance, the Latin and Modern German paradigm of “subjunctive” of indirect speech (\textit{Konjunktiv I}) after verbs of saying; the languages discussed in the text (modern Romance languages and Greek) do not exhibit this “subjunctive”, and verbs of saying typically select the indicative. There is also the paradigm known as \textit{Konjunktiv II}, which I think is closer to the conditional mood. It should be clear that the analysis I propose in this paper will not transfer without modifications to these cases, and the modifications needed will depend on additional factors, which will be left as exercise for future work.
\end{enumerate}
be is the bare form of the infinitive, and one can make the case that the formal category mood does not really exist as a distinct category in English.

Mood can also be a designated complementizer. This pattern is common in Greek and other languages in the Balkans (Serbian, Bulgarian, etc.), as well as Romanian (see Farkas 1985, Rivero, 1994, Terzi, 1992, Giannakidou 1998, 2009, Roussou, 2000, Bulatovic 2008 for general discussion). I illustrate with Greek, where there are two indicative complementizers: oti and pu:

(4) O Pavlos ipe oti efije i Roxani.
the Paul said.3sg that left.3sg the Roxani
‘Paul said that Roxanne left.’

(5) O Pavlos lipate pu efije i Roxani.
the Paul is-sad.3sg that left.3sg the Roxani
‘Paul regrets that Roxanne left.’

Oti is the ‘regular’ indicative complementizer, and pu is indicative complementizer that introduces the complements of emotive factive verbs like lipame, metaniono ‘regret’, xerome ‘be-glad’ (cf. Christidis, 1981; Varlokosta, 1994; Roussou, 1994, 2000). As regard factives, there is a contrast between Greek and Romance language, where factive verbs tend to select the subjunctive (Farkas 1992, Quer 1998, Villalta 2008). With subjunctive complements the subordinator is na:

(6) Thelo na kerdisi o Janis.
want.INP.1sg SUBJ win.PNP.3sg the John
‘I want John to win.’

Greek subjunctives after verbs of volition and directives correspond to English infinitives, hence the contrast oti/pu (indicative) versus na (subjunctive) maps, at least superficially, to a difference between that and to. Just like infinitivals, na complements can be dependent temporally on the tense of the higher verb, a point to which return. Crucially, the verb in both oti/pu and na complements does not contain specified mood morphology—but with na the perfective non-past is used—designated as PNP in the gloss—which is a dependent form itself:
Holton et al. (1997) characterize PNP as a dependent form. Besides na, the PNP can appear also after tha (future particle), the conditional an, and other nonveridical and future oriented connectives such as prin 'before' (Giannakidou and Zwarts 1999).

The dependency of the PNP and its relation to the particles that license is discussed in Giannakidou 2009, and I build in that discussion when we consider the temporal interpretation of the subjunctive in section 6. The use of a dependent designated verbal form for the subjunctive particle characterizes many of the Balkan languages (see e.g. Bulatovic 2008 for Serbian), and I think it makes sense to treat the particle and the PNP as a discontinuous subjunctive.

A good example of this discontinuous strategy for subjunctive marking, by employing both a subordinator and verbal morphology, is Romanian:

Maria believes/knows that Ion her-has.IND written

Maria wants that-him answer

Hence it becomes attractive to describe the Greek pattern as similar to the Romanian, with two designated positions of dependency: one on the subordinator, and one on the verb.
2 Questions about mood to be addressed here

The typology presented in the precious section suggests that mood phenomena must best be thought of as a dependency between a higher position (a verb, or something else as we shall see), and one or two positions in the lower clause. The most obvious question then is: What is the nature of this dependency? Is it lexical selection? Is it lexical selection only?

A second important question is how to characterize properly the lexical semantic property that is responsible for mood choice. Many ideas have been circulated in the long study of mood phenomena as answers to this question, utilizing the following concepts:

- Speech acts and illocutionary force (Searle 1969, Searle and Vanderveken 1985)
- Realis (indicative) and irrealis (subjunctive) distinction;
- Model shift (Quer 1998)
- Assertive force (Farkas 1985, 1992, 2003),
- Situation semantics (Portner 1997)
- Subjunctive denotes a defective tense (Picallo 1985), or a null ordering source (Giorgi and Pianesi 1998).
- Gradability semantics (Villalta 2008)

The various approaches have advantages as well as shortcomings, and I could not possibly review these here. Rather, I will focus on the concept of nonveridicality, and hope to show that, if we assume that this is the property that determines lexical selection of the subjunctive in embedded clauses and with adjuncts, we can also explain the triggering of the subjunctive in non-selection patterns, thus enabling a unifying analysis. Nonveridicality also will be crucial is capturing the correlation between the subjunctive and NPI-licensing (Giannakidou 1998, 1999). These present empirical and analytical advantages that other theories will have to match when compared to the nonveridicality approach.

The final question we explore concerns the meaning of the subjunctive itself. Descriptively, the subjunctive is considered to express some kind of “modality” but what kind exactly is never
made specific. In a recent work (Giannakidou 2009) I argued that the core contribution of the subjunctive is temporal, and here I will build on that work.

The discussion continues as follows. In section 3, we review first the core selection patterns in order to establish that the subjunctive is selected by predicates (verbs as well as adjuncts) that are nonveridical. Then, in section 4 we look at non-canonical cases where the subjunctive appears to be triggered as polarity item. In the end, we show that both cases of the subjunctive manifest lexical sensitivity to nonveridicality. In section 5 we discuss the temporal properties of the subjunctive and use them to explain the limitation of the subjunctive to nonveridical contexts.

3 Mood choice and nonveridicality

In this section we review first the basic selection patterns in embedded clauses in Greek. These facts are well known (Giannakidou 1995, 1998, 1999, 2009), so I will only summarize them here. In 3.2 we define formally the notion of veridicality and nonveridicality, and show how it is relevant for mood choice in embedded clauses. In section 3.3. I discuss mood selection in adjunct clauses and show it to be consistent with nonveridicality.

3.1 Basic selection patterns in Greek and Romance

In my earlier work, I proposed an account of mood choice in Greek, based on the notion of (non)veridicality (for an extension of the notion to Russian mood choice see Likewise in Russian (Borschev et al. 2007). This account posits a divide within the class of intensional verbs depending on whether a truth inference is available, i.e. whether at least one epistemic agent (the speaker or the subject of the main verb) is committed to the truth of the complement sentence. If a propositional attitude verb expresses such a commitment, it will be veridical and select the indicative; if not, it will be nonveridical and select the subjunctive. Summarizing, the verbs that select indicative (oti and pu) complements are listed below:
(11) **Indicative verbs**

*assertives:* leo ‘say’, dhiavazo ‘read’, isxirizome ‘to claim’

*fiction verbs:* onirevome ‘to dream’, fandazome ‘imagine’

*epistemics:* pistevo ‘believe’, nomizo ‘think’

*factive verbs:* xerome ‘be glad’, gnorizo ‘know’, metaniono ‘regret’

*epistemic ifactives:* anakalipto ‘discover’, thimame ‘remember’

Fiction and epistemic verbs express commitment to the truth of their complement by the main clause subject. These verbs select the indicative in most European languages that allow mood choice (with the exception of Italian epistemic verbs in certain contexts, see Portner, 1997, and Giorgi and Pianesi, 1998; and factives which tend to select the subjunctive in Romance). Some illustrations from Greek are given below:

(12)  

a O Pavlos **pistevi** oti I Maria efìje.

the Paul believe.3sg that Mary left

Paul believes that Mary left.

b **Kseri** oti ayorasa ena aftokinito.

know.3sg that bought.1sg a car

He knows that I bought a car.

c I Maria **onireftike** oti ayorasa ena aftokinito.

Maria dreamt.3sg that bought.1sg a car

Maria dreamt that I bought a car.

d I Maria **isxiristike** oti ayorasa ena aftokinito.

The Maria know.3sg that bought.1sg a car

Maria claimed that I bought a car.

e I Maria **xerete** {*oti/pu} ayorasa ena aftokinito.

Maria is-gläd.3sg that bought.1sg a car

Maria is glad that I bought a car.

Notice that the choice of indicative after epistemic, dream fiction, verbs, etc. contradicts that traditional view that these are *irrealis* contexts—certainly, they are treated by the grammar as
realis since the mood of unembedded assertion is used in them. I will have some more to say about factives in the next section.

Verbs selecting na-complements, on the other hand, are usually volitional and directive, in the sense that they direct future actions, or modal, or negative; see the list below:

(13) Subjunctive verbs

*volitionals:* thelo ‘want’, elpizo ‘hope’, skopevo ‘plan’

*directives:* dhiatazo ‘order’, simvulevo ‘advise’, protino ‘suggest’

*modals:* (invariant) prepi ‘must’, bori ‘may’

*permissives:* epitrepo ‘allow’; apagorevo ‘forbid’ (negative permissive)

*negative:* apofevgho ‘avoid’, arnume ‘refuse’

These verbs do not express commitment to the truth of their proposition: It can be the case that I want to be an astronaut, but in wanting this I don’t have to be. Here are some examples:

(14) a I Maria theli na aγorasi ena aftokinito.
    Maria wants subj.that buy.3sg a car
    Maria dreamt that I bought a car.

b I Maria protine na aγorasoume ena aftokinito.
    Maria suggested.3sg subj.that buy.1pl a car
    Maria suggested that we buy a car.

c I Maria epimeni na aγorasoume ena aftokinito.
    Maria insists subj.that buy.1pl a car
    Maria insists that we buy a car.

d Prepi na aγorasoume ena aftokinito.
    must.3sg subj.that buy.1pl a car
    Maria insists that we buy a car.

e Bori na aγorasoume ena aftokinito.
    must.3sg subj.that buy.1pl a car
    Maria insists that we buy a car.
Certain verbs, e.g. *elpizo* ‘hope’, can take subjunctive as well as indicative complements—such shifts are common crosslinguistically among verb classes, and are usually accompanied by a change in the verb meaning (Giannakidou, 1995; Quer, 1998), a fact supporting the idea that the higher verb somehow "licenses" the subjunctive.

3.2 Nonveridicality, assertions, and truth

In philosophy, the term *veridicality* is related to truth and sometimes existence (as in Montague 1969). Giannakidou (1994 and sequel) and Zwarts (1995) define the notion in terms of truth, and this is the framework I assume here. Veridicality is a property of sentence embedding functions: such a function $F$ is veridical if $Fp$ entails or presupposes the truth of $p$. If inference to the truth of $p$ under $F$ is not possible, $F$ is nonveridical. In other words, veridical operators express certainty and an individual’s commitment to the truth of a proposition, but nonveridical expressions express uncertainty and lack of commitment. Within the class of the nonveridical expressions, negation is identified as *anti-veridical* in that $\neg p$ entails that $p$ is false.

(15) (Non)veridicality for propositional operators (Giannakidou 2006)

i. A propositional operator $F$ is veridical iff $Fp$ entails or presupposes that $p$ is true in some individual’s epistemic model $M_E(x)$; otherwise $F$ is nonveridical.

ii. A nonveridical operator $F$ is *anti*veridical iff $Fp$ entails that $\neg p$ in some individual’s epistemic model: $Fp \rightarrow \neg p$ in some $M_E(x)$.

This definition uses *epistemic models of individuals*. The use of multiple models in assessing truth is noted also in Tancredi 2007, who proposes that multiple models introduce also multiple (possibly overlapping) domains. Epistemic models are doxastic functions, i.e. sets of worlds compatible with what an individual believes in a world $w$ (see Heim 1992 and earlier references):

(16) Epistemic model of an individual (Giannakidou 1998)

An epistemic model of an individual $x$, $M_E(x)$, is a set of worlds $w'$ accessible from a world $w$, compatible with $x$’s beliefs in $w$. 

9
Truth is thus relativized wrt to an epistemic model: a proposition $p$ is always true of false wrt some individual. For $p$ to be true, it must be that $M_E(x) \subseteq p$:

(17) Truth in a model

A proposition $p$ is true in an epistemic model $M_E(x)$ iff:

$$\forall w [ w \in M_E(x) \rightarrow w \in \lambda w'. p (w')]$$

An unembedded assertion will be evaluated with respect to the speaker’s model, naturally:

(18) a     John won the race.

b     $[[John won the race]] = 1$ iff

$$\forall w [ w \in M_E(speaker) \rightarrow w \in \lambda w'. John wins the race in w']$$

Hence an unembedded positive assertion in the simple past is veridical. In unembedded assertions, indicative expresses default speaker commitment.

Nonveridicality, on the other hand, characterizes the meaning of functions that do not require commitment of an individual to the truth of a proposition: negation, disjunction, imperatives, questions, are all nonveridical. E.g. from the truth of *Please find a snake!*, or *Did you find a snake?*, or *John didn’t find a snake*, we cannot infer a snake was found. These are precisely the contexts that license negative polarity items (NPIs) and the subjunctive.

When it comes to sentence embedding, Giannakidou 1998, 1999 argues that epistemic and factive attitudes are veridical. For $x$ believes that $p$ to be true, it must be the case that $x$, the main clause subject, is committed to the truth of the embedded proposition $p$. Though the speaker might disagree, a prerequisite for $p$ to be true is that Jacob's epistemic model (i.e. the set of worlds compatible with what Jacob believes) be a subset of the worlds where $p$ is true: $M_E(Jacob) \subseteq p$. The speaker may believe or even know that what Jacob believes is false, but this is irrelevant for Jacob’s beliefs.

(19) $[[Jacob believes that Ariadne loves Paul]] = 1$ iff

$$\forall w [ w \in M_E(Jacob) \rightarrow w \in \lambda w'. Ariadne loves Paul in w']$$
(See also Tancredi 2007 for a very similar formulation). Since all worlds in the model $M_E(Jacob)$ are $p$-worlds, believe is veridical: $[[\text{pistevo } (x \ p)]_c = 1 \rightarrow [[p]_{MB(x)} = 1$; likewise, other epistemic verbs such as think, and imagine, and fiction verbs (dream). Factivs are strongly veridical: the worlds in the speaker’s model too are $p$-words, consistent with the observation that factive complements are presupposed to be true (see Giannakidou 1998, 1999 for more discussion).

The volitional and directive class, on the other hand, does not require an individual’s commitment to the truth of the embedded proposition, and express a weaker relation between the speaker and the embedded proposition. Consider thelo ‘want’. The truth condition for thelo simply requires that the intersection between $M_E(x)$ and $p$ be nonempty:

\[
[[\text{Jacob wants that Ariadne leave}]] = 1 \text{ if } \exists w [w \in M_E(Jacob) \land w \in \lambda w'. \text{Ariadne leave in } w']
\]

$X$ wants $p$ is true in case there is a world in $M_E(x)$ that is also a $p$-world. We can thus envision $M_E(x)$ as partitioned into two sets, $W_1$ and $W_2$. $W_1$ is the part that intersects with $p$. $W_2$, is the part containing non-$p$ worlds: therefore $W_2 \cap p = \emptyset$. There is a dimension of meaning additional to the truth condition above, namely that the worlds in $W_1$ are more desired alternatives than the worlds in $W_2$ (for recent analysis that capitalizes on this property see Villalta 2008; I will have some comments on this next when we consider adjuncts and NPI licensing). However, for the truth conditions, from want $(x, p)$ we cannot infer that $p$ is true in $M_E(x)$. Giannakidou 1998 extends this analysis to modal verbs.

Nonveridicality thus makes the right generalization about mood choice in complement clauses: the subjunctive will appear after nonveridical verbs. As we see next, this generalization carries over to mood selection in adjunct clauses too.

### 3.2 Mood selection in adjunct clauses

Non-veridical connectives such as xoris ‘without’—which is antiveridical—and prin ‘before’ appear only in the subjunctive (Giannakidou 1994, Giannakidou and Zwarts 1999):

\[
a \text{Ekane ti metafrasi xoris na xrisimopiisi leksiko.}
\]
He did the translation without using a dictionary.

b) *Ekane ti metafrasi xoris xrisimopiise leksiko.

Before SUBJ sleep.PNP.3sg washed.PP3sg his teeth

Before he slept, he washed his teeth.

b) *Prin kimithike, epline ta dontia tu.

After slept3sg washed.PP3sg his teeth

Both sentences here make reference to the past, but as we see the past tense is not allowed. Instead, *na must be used with the ensuing PNP.

The means ‘without’ and ‘before’ have been characterized as nonveridical (Giannakidou 1997, 1998, Zwarts 1995, Giannakidou and Zwarts 1999), and *before also selects the subjunctive in French and other Romance languages.

The selection pattern with adjuncts thus follows the sensitivity to nonveridicality we observed with verbs, and I think it is fair to note that an account relying on gradability (Villalta 2008) will have trouble extending to these cases since they involve no attitude, thus no gradability.

With veridical particles, on the other hand, such as *afu “after” the subjunctive is out:

(23) a) *Afu (na) kimithi, figame.

After SUBJ sleep.PNP.3sg left.3sg

b) Afu kimithike, figame.

After slept.3sg left.3sg

After he slept we left.

---

3 We also see that *na can be dropped with prin, but not xoris—a fact that makes us think that prin belongs to the class of particles that have the property needed to legitimize the otherwise illicit PNP (namely introducing a relative n, as in Giannakdiou 2009, see also discussion in section 5).

4 In French, expletive negation can also appear in the avant que ‘before’ clause. This property of expletive negation renders it polarity like, and is observed in other languages. Recently, Yoon (2008) presents data from Korean and Japanese illustrating that expletive negation is triggered also after the nonveridical volitional verbs we discuss earlier, e.g. want, hope, etc, thus supporting further the connection between expletive negation, polarity triggering, and nonveridicality.
We thus confirm that the selection of the subjunctive after nonveridical expressions is a general property of the grammar of Greek. We now see that we get a bonus: we can explain why polarity items (NPIs as well as FCIs) appear in the subjunctive clauses only. We see this with the adjunct first, and then proceed with complement clauses in the next section.

(24)  

| a | I Maria efije | prin | na milisi me {kanenan/opjondhipote}. |
|    | Mary left     |      | before she talked to anybody.       |
| b | * I Maria efije | afu | milise me {kanenan/opjondhipote}.   |
|    | *Mary left    |      | after she talked to anybody.        |

We see here that ‘prin’ ‘before’ but not *afu ‘after’ allow the NPI kanenan or the FCI opjondhipote (Giannakidou 1998, 2001); notice the exact parallel with *any, despite the absence of the mood distinction. Likewise, *xoris and without:

(25)  I Maria ekane ti metafrasi xoris kamia voithia. 
Mary did the translation without any help.

These facts evidence that nonveridicality is relevant not just to mood selection, but also polarity item licensing, and allow us to embed subjunctive selection in this context. Let’s see next the glowing parallel in embedded clauses.

3.4 Polarity licensing correlates with mood choice in embedded clauses

In Giannakidou 1994, 1995, 1998, 1999 I noted that NPIs and FCIs appear in the complements of the nonveridical attitudes but not in indicative complements. Notice the contrasts below:

(26)  I Ariadne epemine na afisoume {opjondhipote/kanenan} na perasi mesa. 
the Ariadne insisted.3sg subj.1pl FCI-person/ NPI-person subj come.3sg in 
‘Ariadne insisted that we allow anyone in.’

With kanenan: ‘Ariadne insisted that we allow some person or other to come in.’

(27)  I Ariadne θa ιθελε na milisi me {opjondhipote/kanenan} fititi.
the Ariadne would like.3sg subj talk.1sg with FC- /NPI- student
‘Ariadne would like to talk to any student.’

(28) a  * O Pavlos pistevi oti akuse \{kanenan/opjondhipote\} òorivo.
the Paul believe.3sg that heard.3sg NPI / FCI noise
* Paul believes that he heard any noise.

b  * Kseri oti ayòrasa \{kanena/opjodhipote\} aftokinito.
know.3sg that bought.1sg NPI / FCI car
* He knows that I bought any car.

This contrast holds in other languages that have similar polarity items and the subjunctive, e.g. Spanish and Catalan (the data below are from Quer 1998, 1999):

(29) a  La Paola vol evitar que desaparegui qualsevol llengua minoritària. (Catalan)

b  Paola quiere evitar que desaparezca cualquier lengua minoritaria. (Spanish)
Paola want.3sg avoid disappear.subj.3sg FC language minoriatia
Paola wants to prevent any minority language from disappearing.

(30) a  * La Paola creu que desapareix qualsevol llengua minoritària. (Catalan)

b  *Paola cree que desaparece cualquier lengua minoritaria. (Spanish)
Paola believe.3sg that disappear.ind.3sg FC language minority
*Paola believes that any minority language is disappearing.

Notice also that the correlation holds regardless of the formal marking of mood. In English too any appears in the complement of directive nonveridical verbs—*would like, ask, be willing*—and is excluded from the complements of veridical epistemic and dream/fiction verbs:

(31) a  John would like to invite any student.

b  John asked us to invite any student.

c  John is willing to invite any student.

d  I insist that you allow anyone in.
Recall in addition that NPIs and FCIs appear in before but not after clauses. These facts are problematic for the downward entailment (DE) approach to polarity, including von Fintel’s (1999) Strawson DE (see recent discussion of this in particular, and comprehensive criticism of Strawson DE in Giannakidou 2006). But nonverdicality captures the correlation between the embedding predicate and connective and the possibility of PI-licensing; and importantly, it has the advantage of unifying polarity licensing and mood choice, by rendering them both manifestations of the same kind of lexical sensitivity. In analyses of the subjunctive based on intensionality alone, non-assertiveness (Farkas), or gradability (Villalta) the observed unifying empirical pattern remains just a coincidence.

Non-canonical uses of the subjunctive, as we see next, can also be captured as sensitivity to nonveridicality.

4 “Non-canonical” uses of the subjunctive

Often the subjunctive seems to be “triggered” by a nonveridical element in the higher structure. We see this with relative clauses, certain double selection patterns, and negation.

4.1 Subjunctive triggered by negation

The subjunctive can be triggered in the lower clause if the higher verb, which otherwise selects the indicative, is negated. This holds for a number of languages: Greek (Giannakidou 1995), Romance (Quer 1998, 2009), and Balkan languages (Siegel 2009):

(32)  a  * John believes that we invited any student.
      b  * John dreamt that we invited any student.

(33)  Pienso que está dormida        Spanish
      think.1sg that 3.s.be.IND asleep.Fem
      ‘I think she is asleep.’

(34)  No pienso que esté dormida.
      not think.1sg that 3.s.be.SUB asleep.Fem
‘I don’t think she is asleep.’

(35)  a  Pistevo  oti  irthe o Janis.  Greek  
    believe.1sg  that-ind  came.3sg the John  
    I believe that John came.

  b  Dhen  pistevo  oti  irthe o Janis.  
    believe.1sg  that-ind  came.3sg the John  
    I don’t believe that John came.

  c  Dhen  pistevo  na  irthe o Janis.  
    believe.1sg  that-SUBJ  came.3sg the John  
    I don’t expect that John came. (I would hope he didn’t).

Here the subjunctive is licensed by negation, like an NPI; and notice that there is a choice between the subjunctive and the indicative. Importantly, the use of the subjunctive comes a meaning shift in the main predicate: dhen pistevo na in the example loses its epistemic meaning and means rather something akin to “I hope not”.

This meaning shift is present systematically whenever we have a choice in mood, even in the absence of negation. Consider the following:

(36)  a  O Janis lei  oti  efijan noris.  
    The John says  that-IND  left.3pl early  
    John says that they left early.

  a  O Janis lei  na  figoun noris.  
    The John says  that-SUBJ  leave.3pl early  
    John {wants/is planning} them to leave early.

Here lei na loses its assertive meaning, and acquires a volitional, directive meaning. Another interesting case is the factive verb:
Of the two sentences, only the a version is factive and veridical: there is a fact that John visited his grandmother (hence that John visited his grandmother is true), and that fact made John happy. (We can think of facts as events, this is not crucial to the point here). Notice the perfective in both the higher and the lower verb. The b version, on the other hand, contains imperfective on both forms, and this renders the sentence habitual, as can be seen in the translation by the addition of *that summer*. The habitual was shown to be nonveridical in Giannakidou 1995, 1998 in the sense that it expresses only a weak existential conditional rather than a universal one: in \([Q \ A \ B]\) is true if not all A are B \(^5\). Rather, depending on the Q-adverb we will have intersection between A and B, or the two sets will be disjoint (e.g. with *never*).

So the important thing to note is that the lexical dependency with to a higher nonveridical element is observed even in these non-canonical cases.

### 4.2 Mood choice in relative clauses

Farkas 1985 proposed the following generalization for the triggering of the subjunctive in relative clauses:

\[(38) \quad \text{Farkas’s generalization} \quad \text{(Farkas 1985)}\]

Subjunctive relative clauses (SRs) are grammatical iff they modify NPs which are interpreted inside the scope of intensional operators.

\(^5\) Unless there is an explicit adverb *always*; in which case A is included in B. When this happens, NPIs are out in Greek (Giannakidou 1995).
In Giannakidou 1998 (chapter 3), I showed that this generalization can best be understood as being about existence. Consider the following example:

(39) Theloume na proslavoume mia gramatea [pu na gnorizi kala japonezika.]
    want.1pl subj hire.1pl a secretary that subj know.3sg good Japanese
    We want to hire a secretary that has good knowledge of Japanese. (But it is hard to find one, and we are not sure if we will be successful).

(40) \[ \exists w'[w' \in M_E(us) \land \exists x \text{ secretary}(x, w') \land \text{speaks good Japanese}(x, w') \land \text{hire}(we, x, w')] \]

The use of the subjunctive in the relative clause, as we see, forces the NP to be interpreted inside the scope of thelo ‘want’—that is, within the epistemic alternatives of the subject—and the NP cannot be interpreted specifically or referentially. The truth condition is consistent with a situation where we do not actually find a secretary with knowledge about Japanese. Without the subjunctive, the NP is forced to be interpreted outside the scope of thelo “want”, referentially or specifically:

(41) Theloume na proslavoume mia gramatea [pu gnorizi kala japonezika.]
    want.1pl subj hire.1pl a secretary that know.3sg good Japanese
    We want to hire a secretary that has good knowledge of Japanese. (#But it is hard to find one, and we are not sure if we will be successful).
    OK: Her name is Jane Smith.

(42) \[ \exists x \text{ secretary}(x, w) \land \text{speaks good Japanese}(x, w) \land \exists w'[w' \in M_E(us) \land \text{hire}(we, x, w')] \]

As a result, we cannot have definites being modified by subjunctive relatives, and the subjunctive will obligatorily be used with verbs of creation:

(43) I Roxani theli na pandrefti {enan/*ton} andra pu na exi
    the R. want.3sg subj marry.3sg a/*the man that subj have.3sg
    pola lefta.
much money
‘Roxanne wants to marry a man who has a lot of money.’

(44) Prepi na grapso mia ergasia [pu na ine pano apo 15 selidhes.]

must.3sg subj write.1sg an essay that subj is more than 15 pages
‘I have to write an essay which has to be longer than 15 pages.’

(45) */#Prepi na grapso mia ergasia [pu ine pano apo 15 selidhes.]

Importantly, negation also triggers subjunctive in the relative clause, which is again reminiscent of NPI behavior:

(46) Dhen idha enan andra [pu na forai kokino kapelo.]

not saw.1sg a man that subj wear.3sg red hat
‘I didn’t see a man wearing a red hat.’

(47) ¬∃x [man(x) ∧ wear-red-hat (x) ∧ saw (I,x)]

(48) Dhen idha enan andra [pu forai kokino kapelo.]

not saw.1sg a man that wear.3sg red hat
‘I didn’t see a man wearing a red hat.’

(49) ∃x [man(x) ∧ wear-read-hat (x)] ∧ ¬ saw(I, x)

The NP with the subjunctive relative again takes narrow scope wrt negation, but without na the NP takes wide scope. Given that negation is not an intensional operator, it is important to emphasize here that the subjunctive triggering in relative clause, at least in Greek (and see Partee 2008 for similar data in Russian) must be better understood as sensitivity to nonveridicality, rather to intensionality, as was claimed initially by Farkas. The gradability approach (Villalta 2008) will also have trouble explaining the subjunctive in this set of facts, as again these do not involve gradability. I will not go into more details here (see Giannakidou 1998: chapter 2 for more extensive data and discussion).
5 The meaning of subjunctive: the subjunctive as a non-deictic time

Since we have established that the subjunctive depends, in all contexts, on a nonveridical element to license it, we can now ask the question: why is the subjunctive sensitive to nonveridicality? As with other cases of polarity, this question essentially asks what the meaning of the subjunctive is, and how exactly it is responsible for the limitation to nonveridical contexts.

A common idea has been that the subjunctive is modal (Roussou 2000) or futurate, i.e. with subjunctive comes somehow future orientation. This may be true in most cases, but it is not always the case, as we saw e.g. earlier with xoris ‘without’, where the xoris clause can be simultaneous to the main clause:

(50) I Ariadne milise xoris na xrisimopiisi mikrofono. (without)
    the Ariadne talked.3sg without subj use.PNP.3sg microphone
    ‘Ariadne talked without using a microphone.’

I will follow my earlier work (Giannakidou 2009) and argue that the contribution of the subjunctive is temporal, but that the subjunctive itself has nothing to do with the future. As a starting point here, recall that there are two positions that are relevant for subjunctive structures: the particle position in C (na), and the verbal position (perfective nonpast).

(51) Na kerdisi o Janis.
    na win.PNP.3sg the John
    ‘Let John win.’ (request or permission)

I will also assume the following phrase structure for Greek (Giannakidou 2009):
The Now-T and Mood projection, where \( na \) is generated, will be important, as well as the C position. Though \( na \) appears to be a subordinator, I will assume here that it is generated as a Mood head following Giannakidou 2009 (and earlier work by Philippaki-Warburton). Before we address the role of \( na \), however, we need to understand the contribution of the PNP so that we can explain why \( na \) is needed.

5.1 Tense and aspect in Greek

The Greek verb is obligatorily inflected for tense and aspect. The four possibilities for the verb \( \text{grafo} \) ‘I write’ are given in (53) (cf. Mackridge, 1985; Holton et al., 1997):
The basic temporal opposition is between a morphological past, which is usually marked by the prefix e- attaching to the verbal stem and specific inflection, and the nonpast which is signalled by the absence of the prefix e- (hence the label nonpast), and which has its own inflection. The nonpast is not equivalent to a present, as will become evident soon.

Following standard assumptions (and I am relying here on Kamp and Reyle, 1993; Klein, 1994; von Stechow, 2002; Giannakidou, 2003, 2009), I will take it that perfective aspect (Aktionsart will be ignored; see Giannakidou 2003, 2009) is a lower function that applies to the verb meaning first; then tense is applied. In order to achieve simpler types and syntactic structures, I am also assuming that the subject is in VP at least at LF, an assumption fully consistent with the fact that the Greek subject is generated in this position. Greek exhibits verb movement to T in declarative clauses, but for the purposes of semantics, V is interpreted inside the VP, just like in English. The T head gives temporal information, specifically temporal orientation (a time prior to the utterance time for the past morpheme; for the nonpast we see below.) Following Abusch (2004) and others, I will also assume that the tenseless VP is a time abstract of type $i,wt$ (for $i$ the type of a time interval, and $wt$ the type of propositions ).

For Klein (1994), grammatical aspect concerns the relationship between event time and topic time, where "topic time" refers to Reichenbach's reference time. According to Comrie (1976:16), further, "perfectivity indicates the view of a situation as a single whole, without distinction of the various separate phases". Greek perfective follows these descriptions and exhibits the typical eventive meaning associated with the perfective: it creates statements that involve existential quantification over events. I will thus treat perfective aspect, quite standardly,
as the modifier function below: it takes the VP meaning P as its input and gives back a predicate of times such that an event characterized by P is included in those times:

\[ [\text{PFT}] = \lambda P \lambda t \exists e [ P(e) \land e \subseteq t ] \]

The condition ‘e \subseteq t’ (Kamp and Reyle 1993) expresses that e takes place, or is included, at t. A typical sentence with past perfective is interpreted episodically:

\[ (56) \text{a. I Ariadni kissed ton Pavlo.} \]
\[ \text{Ariadne kiss.PP.3sg the Paul} \]
\[ ‘\text{Ariadne kissed Paul.’} \]
\[ \text{b. } \exists e [ \text{kiss (Ariadne, Paul, e) } \land t < n \land e \subseteq t ] \]

Imperfective aspect in Greek, on the other hand, is used for habitual and generic statements, as well as to denote progressive and ongoing events, as is common crosslinguistically. I will not discuss the imperfective here at all.

Regarding tense, I will assume the pronominal theory of tense (originating in Partee's, 1973, 1984 seminal work; see also Heim, 1994; Abusch, 1998, 2004, and others). Tenses contribute temporal variables, and they also give temporal orientation. E.g. a past tense denotes anteriority: it refers to a time prior to the utterance time, designated here as n:

\[ (57) [\text{PAST }]_{^g}^{^c} \text{ is defined only if } g(t) < n, \text{ in which case } [\text{PAST }]_{^g}^{^c} = g(t) \]

I am following Heim in representing the orientation as a presupposition, but in the formulas I will be using we also find it as part of the sentence. As pronominal elements, times can also be bound, for instance by existential quantifiers as in Bauerle (1979), von Stechow (1992), and Kratzer (1998). The past tense, as suggested above, expresses anteriority with respect to \( n \), and it is this that makes the past function as a "real", independent tense. A perfective past sentence in Greek, then is derived as follows:
(58) **Kerdise** o Janis.
    won.PP.3sg the John
    ‘John won.’

(59) \[ \text{TP: } \exists e \ [ \text{win} (j, e) \land e \subseteq \text{PAST} ] \]

\[ \text{T}^0: \text{kerdise} \]
\[ \text{AspectP: } \lambda t \exists e \ [ \text{win} (j, e) \land e \subseteq t ] \]
\[ \text{PAST} \]
\[ \text{Asp}^0: \text{PFT=} \]
\[ \lambda P \lambda t \exists e \ [ P (e) \land e \subseteq t ] \]
\[ \text{VP: } \lambda t \text{win} (t, j) \]
\[ \text{t, o Janis} \]

Aspect operates on the verb meaning first. The output of aspect serves as the input to Tense, which fills the interval argument (following Abusch, 2004:37), in this case with the PAST. So, a typical sentence with past perfective is interpreted episodically, and the past tense specifies independently a relation to the utterance time: anteriority.

Let us see now what the contribution of nonpast is, and what goes wrong when we combine it with perfective aspect.

**5.2 What goes wrong with perfective nonpast?**

I argued in Giannakidou 2009 that the Greek PNP cannot make reference to the utterance time, as is usually assumed to happen with apparent present tenses. In other words, Greek nonpast does not function as a present tense. Instead, the PNP denotes an interval whose left boundary is a non-deictic variable \( t \). This variable cannot be interpreted as a free variable picking up the utterance time contextually, it will thus depend on another element in the sentence for reference. In containing such a variable, the Greek PNP is not special, but follows the pattern I identified for non-deictic variables (Giannakidou, 1998, to appear):

(60) **Non-deictic variables** (Giannakidou 2008: (109))

An variable \( x \) is non-deictic iff \( x \) cannot be interpreted as a free variable.

---

6 Perhaps with the exemption of auxiliary verbs where there is no aspectual distinction.
It is the presence of this referentially deficient temporal variable that renders PNP a dependent form. I will propose the following semantics for nonpast.

(61) \[ [[\text{nonpast}]] = \lambda P \lambda t P((t, \infty)) \]

This semantics is inspired by Abusch's (2004) analysis of *will* as a substitution operator. According to Abusch, "in the substitution operator, \( t \) is a bound variable that corresponds to the tense argument of *will* [which is \( n \), coming from the higher PRES; clarification mine]. For a top-level occurrence of *will*, the effect is to substitute \((n, \infty)\) for \( n\)" (Abusch, 2004:39). However, with the Greek nonpast we will not be able to do this substitution because, unlike *will*, which is decomposed into the substitution operator plus PRES supplying \( n \) (Abusch 2004: 48)), the Greek nonpast contains no higher temporal information, that is, no PRES, it will thus require some other element to supply \( n \); without it, \( t \) remains free at the top. But \( t \) is, as Abusch puts it, a *bound* variable, and as such it cannot be left free. In this case, the structure becomes ill-formed:

(62) \[ \text{*TP: } \exists e [\text{win} (j, e) \land e \subseteq (t, \infty)] \]

\[ \text{T}^0: \text{nonpast: } \text{kerdisi} \]
\[ \lambda P \lambda t P((t, \infty)) \]
\[ \text{AspectP: } \lambda t \exists e [\text{win} (j, e) \land e \subseteq t] \]
\[ \text{Asp}^0 : \text{PFT=} \]
\[ \lambda P \lambda t \exists e [P(e) \land e \subseteq t] \]
\[ \text{VP: } \lambda t \text{win} (t, j) \]
\[ \lambda t \text{win} (t, j) \]
\[ \text{t, } o \text{ Janis} \]

The interval \((t, \infty)\) lacks temporal orientation, because \( t \) lacks reference to a time: it can only be interpreted as bound variable, and here there is nothing above nonpast to bind it. A kind of default rule that would give the utterance time as its value would not work either, because it doesn’t supply a real binder. The PNP form must therefore rely on another element in the sentence to give a value to \( t \). This is why the PNP must be “licensed”.

Given the dependent nature of nonpast and its inability to introduce \( n \) that I suggested, with perfective aspect, it becomes necessary to introduce \( n \) in the clause. This is what that happens at Now-TP by *tha*; but if *tha* is not projected, \( n \) will be given by the next inflectional head: Mood.
Na kerdisi o Janis.
subj win.PNP.3sg the John
Let John win! (i.e. I wish that John wins).

[[na]] = n

Na thus introduces n in the subjunctive clause. Given that in indicative clauses n is given by tha, an additional overt exponent in Mood becomes redundant, and this is why there is no overt indicative particle in Greek. In C further resides the directive force, designated below as "!" which assigns to the sentence the illocutionary force of a request or a command:

\[
\text{CP: } ! \exists e \ [ \text{win}(j,e) \land e \subseteq (n, \infty) ]
\]

\[
\text{C\textsuperscript{0}: } \emptyset \quad \text{MoodP: } \exists e \ [ \text{win}(j,e) \land e \subseteq (n, \infty) ]
\]

\[
\lambda p \ ! p \ \text{Mood}\textsuperscript{0: } \text{na: } n \quad \text{TP: } \lambda t \ \exists e \ [ \text{win}(j,e) \land e \subseteq (t, \infty) ]
\]

kerdisi o Janis "John wins"

Here n is introduced by the Mood head which hosts na. At C\textsuperscript{0} we have the operator that gives the illocutionary force of a request or a command: \( \lambda p \ ! p \). (This function is also performed by the imperative morpheme in main clauses). It is important to note here that the analysis separates the semantic contribution of the particle from the pragmatic force, which is not a contribution of na. Occurrences of na with other illocutionary forces, e.g. interrogative, support further the observation that directive force is not an inherent contribution of na:

Pjos na kerdise (araje)?
who subj win.PP.3sg question particle
‘Who (do you think) won?’

Here we have a wh-question, and C hosts the interrogative function which turns a proposition into a question. Na questions of this kind have been described as dubitative (Rouchota 1994), a
flavor due to the particle *araje* (used only in questions), and captured in the translation here by using an epistemic attitude.

In other words, particle subjunctives, and related particles in Balkan languages (I would suppose), have the present-like function of introducing $n$, and are always embedded, even in main clauses. Finally, in sentence embedding $na$ gives the internal now of the attitude, bound by $\lambda$:

**Past (mixed reading)**

\[
\begin{align*}
TP: & \text{ [want} (j, t_2, \lambda n \exists e \ [ \text{win} (j, e) \land e \subseteq (n, \infty) ] )
\end{align*}
\]

\[
\begin{align*}
T: & \text{ wanted 'ithela'}
\end{align*}
\]

\[
\begin{align*}
CP: & \lambda n \exists e \ [ \text{win} (e) \land e \subseteq (n, \infty) ]
\end{align*}
\]

\[
\begin{align*}
C^0: & \lambda
\end{align*}
\]

\[
\begin{align*}
\text{MoodP: } & \exists e \ [ \text{win} (j, e) \land e \subseteq (n, \infty) ]
\end{align*}
\]

\[
\begin{align*}
\text{Mood}^0: & n
\end{align*}
\]

\[
\begin{align*}
TP: & \exists e \ [ \text{win} (j, e) \land e \subseteq (t, \infty) ]
\end{align*}
\]

\[
\begin{align*}
na: & \nonpast: \text{kerdisi}
\end{align*}
\]

\[
\begin{align*}
\text{AspectP: } & \lambda t \exists e \ [ \text{win} (j, e) \land e \subseteq t ]
\end{align*}
\]

\[
\begin{align*}
\lambda t_P (t, \infty)
\end{align*}
\]

(68) The time $t_2$ of my wanting is located in the past, but the time $t$ of John's winning is located in the interval that starts from $t_2$ and extends to $\infty$.

So here we do not have reference to the utterance time either by the PNP or the $na$, thus capturing again the dependency of $na$ and the PNP, as well as the anaphoric property of the dependent tense.

### 6 Conclusions

The main conclusions to be drawn are the following. First, subjunctive selection, as well as triggering, manifest lexical sensitivity to nonveridicality. The cases of canonical (selected) as well as non-canonical (triggered) subjunctives, at least in Greek, seem to follow this pattern—and evidence from Russian adduced in Borchev et al. suggests the same for Russian. The sensitivity of subjunctive to nonveridicality also helps us make sense of the fact that NPIs and
FCIs are licensed in subjunctive clauses only (if the language allows the mood distinction) or under nonveridical elements only—verbs, as well as adjuncts such as before and without. In order to be successful, a semantic account of mood selection must be able to connect these three facts—selection by verbs and adjuncts, non-canonical triggering by negation and in relative clauses, polarity item licensing—and, as far as I can tell, the other accounts currently on the market cannot.

Another way of summarizing our findings is to say that the sensitivity to nonveridicality is a phenomenon grammaticized in at least three ways (mood selection, mood triggering, and NPI licensing). If a language does not have mood distinctions, e.g. English, we are bound to see on the latter; in a language like Greek, we can see all three. In answering the question of why the subjunctive is dependent on nonveridicality, I suggested that the particle na is a relative now; and the PNP contains a non-deictic temporal variable that cannot be interpreted by default referring to the utterance time. The scope of a nonveridical element is a fine context, as here both n and the time of the PNP will not be forced to get default (contextual) values. In main clauses, both the n and the PNP time remain embedded under the imperative or the question operator.

References


Rivero, Maria Luisa and Arhonto Terzi. 1995. “Imperative, V-movement and logical mood”.  


