Chapter 3: (Non)veridicality and mood selection in complement clauses
Book in preparation: Non-verdicality in grammar and thought

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1 Mood on the verb and mood on the subordinator

The study of grammatical mood has a long tradition in linguistic semantics, formal and informal. In this chapter, we focus on mood *selection*, i.e. the case where a propositional attitude verb embeds a complement that needs to appear in a particular mood. Our goal will be to study the meanings of the embedding verbs in order to explain why they select the mood they do— as well as the contribution of the mood morphemes in embedding. Our framework will be the one developed in the first two chapters. Ultimately, we want to provide a broad and predictive semantic typology based on the idea that mood selection as a grammatical phenomenon— like polarity– is sensitive to the property of (non)veridicality. At the same time, as we see further in chapters 4 and 5 where we discuss further mood *choice*, the lexical meanings of some propositional attitudes, and their interactions with tense, may not be monolithically veridical or nonveridical, and this will play a role in explaining crosslinguistic variation— as well as choice within a single language where choice is possible.

1.1 Two exponents of mood: Mood and C

Mood is a morphological category. Typologically, we find morphological distinctions such as indicative, subjunctive, optative, imperative, conditional mood; of these, only the former two appear in complement clauses— which are the focus of our work. Whether a language grammaticalizes mood distinctions is subject to crosslinguistic varaition. Greek, Italian, and French, for examples do— but English doesn't. English does have a form that is sometimes labelled subjunctive, and we find it in clauses after *require, wish*, or in the conditional protasis:

(1) a. The Dean requires that we be/are on time.
b. I wish you were here.
c. If I were rich I would buy a boat

What is labelled as 'subjunctive', however, is not a designated grammatical form specific to the this category, but a past tense and an infinitive. Uses like the above are quite limited to a handful of (almost formulaic) cases, and not a highly productive pattern in complement

embedding like the mood selection and choice observed in Romance and Greek. It is therefore accurate to say that English lacks mood as a grammatical category.

Romance languages and Greek, on the other hand, employ the grammatical category of mood in a number of productive patterns with embedding verbs and sentential connectives. Regarding the subjunctive versus indicative contrast, traditional grammars typically identify the indicative with *realis* and the subjunctive with *irrealis*, and describe the contrast in terms of selection. Observe the basic mood contrast, with attention to French and Italian:

(2) a. Marc sait que le printemps est/ *soit arrivé.
Marc knows that the spring be-IND-3SG/ be-SBJV.3SG arrived
Marc knows that spring has arrived.

b. Marc veut que le printemps soit/ *est long.
Marc wants that the spring be-SBJV-3SG / be-IND-3SG long
Marc wants spring to be long.

c. Le printemps est/ *soit arrivé.
The spring be-IND-3SG / be-SUBJ-3SG arrived
The spring has arrived.

(3) a. Ê Marco knows that the spring be-IND-3SG/be-SUBJ-3SG arrived.
Marco sa che la primavera è/*sia arrivata.
Marc knows that spring has arrived.

b. Marco vuole che la primavera sia/*è lunga. Marco wants that the spring
Marc wants spring to be long.
be-SUBJ-3SG/be-IND-SUBJ-3SG long.

c. La primavera è/sia arrivata.
Spring be-IND-3SG/be-SUBJ-3SG arrived.
Spring has arrived.

The verb *savoir* 'know' in (1a) is said to select the indicative, but the volitional verb *vouloir* 'want' in (1b) selects the subjunctive. At the same time, the indicative is the default mood of unembedded assertions, as in (1c), hence it is thought of as independent mood whereas the indicative has been thought of as 'dependent'. There are also well known independent cases of the subjunctive mood in main clauses, as we discuss soon in Greek, and these are not assertions. In both main assertions and in the complements of *know* verbs, the indicative sentence denotes a true proposition (or, a fact); hence traditional grammars characterize indicative as the *realis* mood. The complement of a desire verb, on the other hand, merely expresses a desire and the content of a desire is not a fact (hence, *irrealis*). This is a typical pattern in all European languages— and in strict selection, the indicative and subjunctive are in complementary distribution: one mood excludes the other, as seen above.

Though the indicative-subjunctive pattern has been most extensively described in Indo-European languages, it is by no means restricted to these. It appears in many of the world's languages, including native American languages (see a recent article by Matthewson 2010 for Salish, and Wiltschko 2016).[1]

[1]The contrast between subjunctive and indicative also correlates with evidentiality, especially in languages that have only one indirect evidential morpheme (Murray to appear, Smirnova 2013). In this case, the indirect

In French and most Romance languages (descending from Latin) the mood exponent appears on the verb, like tense and aspect. This was also the case in Ancient Greek. In contrast, mood can appear outside the verbal form in the subordinating particle— often characterized as a complementizer, i.e. a *that* element, necessary to embed the sentence. The mood contrast in contemporary Greek is manifested in this form, a pattern observed in other Balkan languages including Romanian (Farkas 1985, Rivero, 1994, Terzi, 1992, Giannakidou 1998, 2009, 2011, 2016, Roussou, 2000, Bulatovic 2008, Todorovic 2012, among others). Mood particles appears to be a property of the Balkan *sprachbund*. We focus here on Modern Greek.

Modern Greek has four mood particles that precede the tensed verb: the indicative *oti/pos*, the subjunctive particle *na*, the emotive particle *pu*, and the optative particle *as*.

(4) O Pavlos kseri oti/pos/*na efije i Roxani.
the Paul knows-3SG that-IND left-3SG the Roxani
Paul knows that Roxanne left.

(5) Thelo na/*oti kerdisi o Janis.
want.1sg SBJV win.NONPAST-3SG the John
I want John to win.

(6) O Pavlos lipate pu/*oti /*na efije i Roxani.
the Paul is-sad-3SG that left-3SG the Roxani
Paul regrets that Roxanne left.

(7) As fiji/ efevge o Janis!
OPT leave.NONPAST-3SG/ left-IMPRF-3SG the John
Let John leave! I wish John had left!

Recall also the future particle (*tha*) that functions as an MUST epistemic modal and which we discussed in chapter 2. Above, we see that the complement is marked formally as subjunctive, indicative, optative, or emotive at the level at which the embedded clause is introduced, i.e. at the subordinator C. *Na* is typically followed by the form NONPAST, which itself is dependent and only appears with *na*, the future particle, and other nonveridical particles. It is the form that we found earlier to give future orientation (see also Giannakidou 2009, Giannakidou and Mari 2017), akin to prospective aspectual forms (Matthewson, 2012).

The factive verb *ksero* 'know' selects indicative, and the volitional verb selects subjunctive, just like in French. The emotive verb selects *pu*, which the literature considers a variant of indicative. *Pu* follows emotive verbs only (*lipame, metaniono* 'regret', *xerome* 'be-glad' (cf. Christidis, 1981; Varlokosta, 1994). Another variant of indicative is *pos* which appears to be equivalent to *oti* in all respects, i.e. it is selected by the same verb classes that select *oti*. *As* is the optative particle, and appears only in main clauses.

In the long history of the syntactic characterization of the Greek mood particles the main question has been: are the particles Mood exponents or complementizers? In one approach, *na* is taken to be the inflectional realization of Mood (heading MoodP; Philippaki-Warburton 1993, 1998, Philippaki-Warburton and Veloudis 1984, Tsimpli 1990, Giannakidou 1998, 2009). The second approach claims that *na* is a complementizer C (Agouraki 1991, Tsoulas 1993, and Roussou 2000, who uses an extended C-domain in the spirit of Rizzi 1997). In Giannakidou

evidential is used when the speaker has reduced commitment to the truth of the sentence, therefore the indirect evidential form appears to be 'irrealis', parallel to the subjunctive. We will not discuss indirect evidentials in our study, but the framework we establish, in particular the category of epistemic subjunctive of Giannakidou 2016, appears relevant for the indirect evidential.

2009, it is suggested that *na* is a Mood head that moves to C because it is also a subordinator. The particular syntactic details are not crucial, and since they have been considered in detail elsewhere here we assume simply that all Greek mood particles are C elements, either moved from Mood, or generated at the C position.

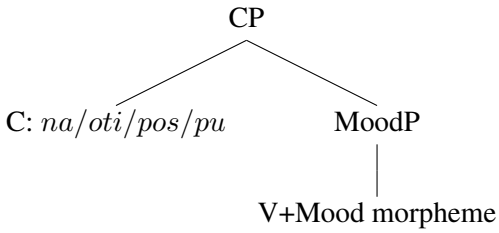
In the C position, if unembedded, the particles get illocutionary force. The main subjunctive and optative below are requests, commands or wishes:

(8) Na/ As fiji o Janis. (Greek)
SUBJ/ OPT leave.PERF.NON-PAST.3SG the John.
John may go./ Let John go.

The *na, as* sentences above have illocutionary force similar to that of the imperative; Giannakidou and Staraki (2017) call them 'hybrid' imperatives. *Oti, pos, pu* do not have such main clause uses, suggesting that the force of the assertion remains unmarked. The fact that the *na, as* have illocutionary force in the main clause suggests that mood, at least as it appears in Greek and languages like it, is not simply convey sentential modality (Portner 2009), clearly not in the main clause. This hypothesis is advanced in Mari (2015,2017) for mood in Italian and proposes a system where verbal mood updates different types of spaces (private and public), in a manner parallel to sentential mood.

What also becomes clear by looking at the morphological exponents of mood in Greek and Romance languages is that mood affects two positions in the embedded clause: the verb (Latin, Romance languages, Ancient Greek), and the subordinator C (Modern Greek, Balkan languages, including Romanian which is a Romance language). The subordinating C has clause typing properties and does not alter the illocutionary type of the complement to non-assertion. However, the embedded C position can be implicated to do some work regarding how to anchor or update the information coming from the embedded clause. Since we have embedding, the C position can be understood as the introducer of local context, and the mood morpheme as giving instructions on how to anchor the embedded proposition to the local context. Assuming the two positions below, then, we will argue that Greek (particle) and Italian (verbal) mood jointly show that mood has implications both at the level of nonveridicality, and at the level of embedding, which we will define as *anchoring instructions* below.

(9)



Given that embedded clauses are embedded, we cannot presume that they are anchored to the common ground or that they affect it directly— unlike unembedded sentences which do. Here we will pursue the idea that the embedded sentence must be anchored to a local "ground", which however is not common, but *private*, specifically belonging to the main clause subject. The private spaces are the models M we introduced in chapter 2, and we will show that can be of various kinds (epistemic, doxastic, as defined for the modals, but also fictional, perceptional, memory, etc). The indicative and subjunctive morphemes have presuppositions that they the subject's private space will be veridical (indicative) or non(veridical), and their function is to anchor the proposition to that space. In Italian, as we see in the next chapter, anchoring can happen also to the common ground (Mari, 2017), and this will produce nonveridicality and license the subjunctive. This will be shown to work also in Greek, but to a much more limited

degree with perception and memory verbs, and to an even more limited extend the verb *vrisko* 'find'.

One can think of the contrast between indicative and the subjunctive particles in Greek as *that* vs. *to* complements in English, bearing also in mind that in Modern Greek all complementation is finite (the language lacks infinitives).[2] Since mood is not marked on the English *that* and *to*, one must ask the question of how to transfer our analysis of Greek and Italian moods to a language that lacks mood distinctions such as English. Baunaz (2015) in some recent work on French argues for three different subordinator *que* explicitely reflecting the mood in C even though French, like Italian, does not mark the mood in this position. French, however, does mark mood. If mood morphemes are, as we will argue, instructions about how to anchor propositions, it is not obvious that a languages like English, which lacks the systematic marking of mood, encodes in its grammar the anchoring that we will describe. One can pose it for uniformity but it is a matter of empirical demonstration to show that English Cs work the same way despite the fact that they lack mood.

1.2 Mood *selection* versus *choice*

There is an additional dimension of variation that plays a crucial role in disentangling the two functions of mood morphemes, namely whether we have selection or choice. We observe two patterns: (a) one that involves selection as above by particular classes of verbs and other elements such as (temporal) connectives (e.g. BEFORE, WITHOUT select the subjunctive), and in future oriented free relative clauses; and (b) cases where the speaker has a choice between indicative and subjunctive. In selection, the subjunctive itself does not appear to add much to the semantics, and it is generally accepted that it reflects syntactic dependency (see e.g. recent discussions in Ambar 2016 and Giannakidou 2016). Given what we said above, however, we can now assume that in selection the mood still contributes update information.

In the cases of choice, mood produces also a semantic effect, which Giannakidou calls *evaluative* and which we will discuss in chapter 4. There are many well documented cases of mood choice, summarized below under the label *Optional subjunctive*:

(10) Optional subjunctive: subjunctive adds to the meaning
- *Polarity* subjunctive, triggered by negation of an otherwise indicative selecting verb (Quer 1998, 2001, 2009 for overview, Giannakidou 1995)
- In relative clauses to convey uncertainty of existence (see Farkas 1985, Quer 1998, Giannakidou 1998, 2013a for recent discussion)
- In free relatives, adding the dimension of free choice (Quer 1998, 2001, Marques 2010, Giannakidou and Cheng 2006)
- With modal adverbs of possibility (Giannakidou 2009, 2016)
- Epistemic subjunctive in questions, equivalent to an epistemic modal (Giannakidou 2016)
- Flexible mood choice with verbs that appear to be compatible with more than one mood (Giannakidou and Mari, 2015;2016a,b; Mari 2015,2016,2017b).

Examples to be given under each bullet.

In our study here, we will examine in detail the last case, also known as mood shift. Here is an example. As we see, the verb allows both moods in Greek and Italian:

[2]Giannakidou 2016 further argues that the emotive C *pu* contains expressive meaning, a fact again consistent with its status as subordinator, but we will propose an alternative analysis here.

(11) a. Elpizo na kerdisi/kerdise o Janis.
hope.1SG that.SUBJ win.NONPAST/PAST.3SG the John
I hope for John to win/to have won.
b. Spero che Gianni abbia vinto/vinca.
Hope.1SG.PRES that John have.3SG.SUBJ won/win.3SG.SUBJ.
I hope that John has won.

(12) a. Elpizo oti kerdise o Janis.
hope.1SG that.IND won.3SG the John
I hope that John won.
b. Elpizo oti tha kerdisi o Janis.
hope.1SG that.IND FUT win.nonpast.3SG the John
I hope that John will win.
c. Spero che il Milan vincerà/ha vinto.
Hope.1SG.PRES that the Milan win.3SG.FUT.IND/has won.
I hope that Milan AC will win/has won.

Equivalents of 'hope' are also flexible in other languages (see e.g. a recent discussion of French 'hope' in Portner and Rubinstein 2012). Such cases of apparent flexible mood within a language, especially when there seems to be no preference as is the case with HOPE, have been challenging for almost all analyses of mood. To deal with them, most accounts would have to say in some way or other that the verb meaning changes depending on the mood chosen, something that can indeed be justified given that the apparent mood choice can result in different lexical choice in English— as is the case below with the Greek verbs *leo*, and *arnoume* (examples from Giannakidou 2016, and Giannakidou and Staraki 2013):

(13) a. O Janis lei oti efijan noris.
The John says that-IND left.3pl early
John says that they left early.
b. O Janis lei na figoun noris.
The John says that-SUBJ leave.3pl early
John *wants* them to leave early.

(14) a. O Janis arnithike oti efijan noris.
The John denied that-IND left.3pl early
John *denied* that they left early.
b. O Janis arnithike na fiji noris.
The John says that-SUBJ leave.3sg early
John *refused* to leave early.

Lei says with the *oti* complement has the expected reporting meaning, but with the *na* complement it acquires a volitional, directive meaning, and we translate it as *wants*. Likewise, with *na*, *arnithike* means *refuse* but with *oti* it means *deny*. Here is another example with an emotive verb:

(15) a. O Janis xarike pu episkeftike ti jaja tu.
The John was-happy.PERF.3sg that.IND visited.PRF.3sg his grandmother
John was happy that he visited his grandmother.
b. O Janis xerete na episkeptete ti jaja tu.
The John is-happy.IMPERF.3sg SUBJ visit.IMPERF3sg his grandmother
John is happy to visit his grandmother (but he only rarely gets the chance).

Of the two sentences, only the *pu* version is factive: there is a fact that John visited his grandmother (hence that John visited his grandmother is true), and that fact made John happy. Notice the perfective in both the higher and the lower verb. The *na* version, on the other hand, contains imperfective on both forms, and this renders the sentence non-factive, as can be seen in the continuation that he only rarely gets the chance. Similar mood shifts are observed in many Romance languages, see Quer 2001, 2009 for recent overviews). The *na* complement can also produce change in meaning with the verb *ksero* 'know', becoming equivalent to a how-to complement in English (see Varlokosta 1994, Giannakidou 2011):

(16) O Janis kseri na kolibai.
The John knows.3sg SUBJ swim.imperf.3sg
John knows how to swim.

Flexible mood patterns have remained understudied within the earlier versions of the nonveridicality theory, and pose a major challenge for all accounts of mood selection. Our goal here is to meet the challenges, by enriching the nonveridicality theory with the tools it needs to become a comprehensive analysis of both selection and choice. Crucially, and in contrast to most accounts thus far, the theory we will develop distinguishes between (non)veridicality in the assertion vs. presupposition, and will allow the subjunctive/indicative morphemes to be sensitive to (non)veridicality in either level (Giannakidou and Mari, 2015,2016a,b; Mari, 2015,2016). We need to allow flexibility in the verb meaning, and this can be done if we look more closely to the presupposition vs. the assertion, and allow for mixed cases, i.e. veridicality on one level and nonveridicality on the other. Such a view offers a more nuanced perspective on the verbs meanings, and will allow us to capture the variation in mood choice within *and* across languages without positing lexical ambiguity for the embedding verbs.

In sum, our goal is to account for two major questions:

1. What is the role of mood in selection *and* choice?

2. How does layered (non)veridicality account for the stable cases of mood selection as well as the more variable patterns of mood?

We start our examination by examining, in this chapter, the stable patterns of selection in order to establish the basic analysis of mood as an indicator of (non)veridicality, and as encoding anchoring instruction about the embedded proposition. We will use Greek as the typical case for core selection; Italian mood appears more flexible than in Greek, and we offer more discussion of variation In Italian, as well as Greek, in the next chapter. In section 5, we will discuss further choice with other verbs classes– including memory and perception verbs as well as emotive factive verbs, awareness verbs, and interaction with negation. Our goal is to have a comprehensive theory of mood and a thorough discussion of the most prominent verb classes by the end of chapter 5.

2 Indicative in Greek: veridicality and private anchoring

Mood choice has been a central issue in semantics, both formal and descriptive, but we will not attempt a general overview here (for some recent insightful discussions see Farkas, 1982, 2003; Villalta, 2008; Quer 2009, also Portner and Rubinstein 2012; Smirnova, 2013; see also Giannakidou 1994,1998, 1999, 2009, 2011, 2016 specifically for Greek; Marques 2004, 2010

for Brazilian and European Portuguese; Mari 2015 for Italian; Quer 1998, 2001, for Catalan and Spanish; Sarigul 2015 for Turkish, Baunaz 2015 for French).

One of the recurring characterizations of the subjunctive mood is that it is *dependent*, as opposed to the indicative which is said to be independent, and is the mood par excellence of unembedded assertions. As Giannakidou (2009: 1883) notes:

(17) " A corollary of this distinction renders the subjunctive usable only in complement clauses of verbs that share a particular semantic characteristic, and which select the subjunctive. In its strong form, the dependency thesis is not mere selection by a higher predicate, but claims that the subjunctive is *triggered* by certain semantic properties of the embedding context, pretty much the way polarity items (PIs) are triggered by their licensers; the subjunctive can thus be viewed as a PI of some kind (Giannakidou, 1994, 1995 among others)."

In earlier work, Giannakidou identified mood choice as a polarity phenomenon because they are both sensitive to (non)veridicality. However, just because two phenomena are sensitive to the same factor this doesn't mean that they are the same phenomenon. Here we will capitalize more on the semantic and discourse sensitivity of the mood morphemes. The indicative is understood as default of assertion, and the subjunctive is the otherwise condition associated with embedding and non-assertion (see also earlier literature McCawley 1991, Farkas 1992, 2003). The main clause subjunctives we saw in Greek certainly support the association of subjunctive with non-assertion. The formal study of the parameters regulating mood selection has also featured philosophical discussion on speech acts and illocutionary force (Searle 1969; Searle and Vanderveken, 1985, among others). The interaction between mood and illocutionary force is visible in main clauses.

The most central aim has been to provide a coherent and relatively uniform characterization of the group of verbs that select the subjunctive and those which select the indicative. In Greek, the following verbs select indicative:

(18) Indicative verbs in Greek

a. assertives: leo (say), dhiavazo (read), isxirizome (claim), dilono (declare, assert)
b. fiction verbs: onirevome (dream), fandazome (imagine)
c. doxastic (non-factive): pistevo (believe), nomizo (think), theoro (consider), vrisko (find)
d. epistemic and emotive factive verbs: ksero, gnorizo (know), metaniono (regret), xairomai (be glad)
e. memory verbs: thimame (remember)
f. perception verbs: vlepo (see), akouo (hear)

Italian has a very different patters, and in essence allows mood choice with all these verbs, with the exception of *sapere* ('know'). We consider Italian closely in the next chapter. Here we use Greek, which offers a more clear-cut set of choices to illustrate our new view on mood and its contribution.

2.1 Doxastic verbs pattern with knowledge: private spaces

The general pattern in European languages seems to be that belief and other doxastic verbs– as well as fiction and imagination verbs pattern on a par with *know* verbs and unembedded assertions in selecting the indicative:

(19) Efije i Ariadne.
left. 3SG the Ariadne
Ariadne left.

(20) O Nicholas kseri oti/pos/*na efije i Ariadne.
the Nicholas knows.3SG that.IND/*SUBJ left. 3SG the Ariadne
Nicholas knows that Ariadne left.

(21) O Nicholas pistevi oti/*na efije i Ariadne.
the Nicholas believe.3SG that.IND left.3SG the Ariadne.
Nicholas believes that Ariadne left.

In the unembedded case there is no overt realization of *oti*, but we take it that there is a covert ASSERT operator (Krifka 1995) that renders the sentence an assertion. As we said in our foundational discussion in chapters 1 and 2, veridicality is a precondition on assertion, given Grice's maxim of quality. When a speaker asserts p she is in a veridical state fully supporting p.

Giannakidou 2016 phrases in the clearest way the role of indicative as an indicator of veridicality. The subjunctive, on the other hand, is an indicator of a nonveridical epistemic space:

(22) Indicative as an indicator of veridicality (Giannakidou 2016: (38))
The indicative is the indicator of a veridical epistemic states, and is selected by expressions that are at least subjectively veridical.

(23) Subjunctive as an indicator of nonveridicality (Giannakidou 2016: (46))
(i) The subjunctive is an indicator of a nonveridical epistemic state or modal base, and is selected by expressions that are at least subjectively nonveridical.
(ii) Subjunctive sentences indicate epistemic weakening.

Epistemic weakening is mentioned already in Giannakidou 2013, as a proerty of the subjucntive in relative clauses; following Giannakidou 2014, and discussions also in Giannakidou and Mari 2014, we defined as the creation of a nonveridical epistemic space:

(24) Epistemic weakening
Epistemic weakening is the creation of a nonveridical epistemic space.

We will take these as basic premises of our theory, and will talk more about epistemic weakening and nonveridical states in section 3. Recall that given an epistemic modal space M, (non)veridicality subjectively is defined as follows:

(25) Def. 3. *Subjective veridicality*
A function F that takes a proposition p as its argument is subjectively veridical with respect to an individual anchor i and an epistemic state M(i) iff:
$\forall w[w \in \mathbf{M}(i) \rightarrow w \in \{w' \mid p(w')\}]$.

(26) *Epistemic state of an individual anchor* i (Giannakidou 1999: (45))
An epistemic state M(i) is a set of worlds associated with an individual i representing worlds compatible with what i knows or believes.

M(i) is the private space of i's thoughts, belief and knowledge, and it plays a key role in truth assessment, as we discussed earlier. Subjective veridicality is *anchored* to an individual's M(i). In unembedded assertions, i is the speaker, hence M(speaker) is the default. In embedding, M(speaker) is still relevant, as is the Stalnakerian common ground C, i.e. the set of mutually

known propositions or commitments. But, crucially, M(subject) is also, and as it turns out crucially, relevant.

Recall first our discussion of knowledge:

(27) O Nicholas kseri oti/*na efije i Ariadne.
the Nicholas knows.3SG that.IND left.3SG the Ariadne.
Nicholas knows that Ariadne left.

Given our model structure, the truth condition for knowledge is the following:

(28) $[\![$Nicholas kseri oti $p]\!]$ is true in w with respect to M$(Nicholas)$ iff:
$\forall w'[w' \in$M$(Nicholas) \rightarrow w' \in \{w'' \mid p(w'')\}]$

As we said in our discussion contrasting MUST and knowledge, knowledge verbs are strong: they support p in the entire M(subject)— unlike MUST, where M(speaker) is partitioned. In addition, verbs of knowledge (a) have a factive presupposition that p is true prior to the assertion, which means that p is actually part of the common ground (something to which we return). For these reasons, Giannakidou 1998, 1999 called knowledge verbs *strongly* veridical.

Belief, according to Hintikka, has a veridical truth condition similar to knowledge— only it lacks the factive presupposition, and it does not imply that p is in C or that it is actually true:

(29) O Nicholas pistevi oti/*na efije i Ariadne.
the Nicholas believe.3SG that.IND left.3SG the Ariadne.
Nicholas believes that Ariadne left.

Given our model structure, and following the classical treatments of belief, the truth condition for belief is the following:

(30) $[\![$Nicholas pistevi oti $p]\!]$ is true in w with respect to M$(Nicholas)$ iff:
$\forall w'[w' \in$M$(Nicholas) \rightarrow w' \in \{w''|p(w'')\}]$

For the evaluation of p in 'i believes that p', and because we have third person belief, there are two potential anchors i: the speaker and the main clause subject. Their epistemic spaces need not coincide: the speaker need not believe that p is true, but for the sentence to be true the believer cannot have any $\neg p$ worlds in her belief space. The speaker may believe or even know that what the believer believes is false, but subjective veridicality is satisfied with respect to the M(subject).

Given the sameness of the truth condition with knowledge and belief, it appears to be no surprise that believe and knowledge verbs both select *oti*: in both cases, the main clause subject is in an epistemic state that fully supports p, regardless of whether p is actually true (in the case of belief). Because M(Nicholas) is a doxastic space, M(Nicholas) does not make reference to the actual world w, and it does not guarantee that w is p world (unlike with knowledge). For *oti* to be used, the other Ms, the actual world, and the common ground are irrelevant (Giannakidou 1998, 1999, 2009). *Oti* therefore is an indication that we are dealing with classical belief, which appears to be as strong as knowledge when it comes to mood selection— and never selects the indicative. Here are some more examples with belief verbs to make this clear:

(31) O Nicholas nomizi oti/*na efije i Ariadne.
the Nicholas thinks.3SG that.IND left.3SG the Ariadne.
Nicholas thinks that Ariadne left.

(32) O Nicholas theori oti/*na i Ariadne ine eksipni.
the Nicholas believe.3SG that.IND left.3SG the Ariadne.
Nicholas believes that Ariadne left.

(33) O Nicholas vriskei oti/*na i Ariadne ine eksipni.
the Nicholas believe.3SG that.IND left.3SG the Ariadne.
Nicholas believes that Ariadne left.

Nomizo 'think', theoro 'consider' and vrisko 'find' are all doxastic and all take *oti* and *pos* complements. (We take up the discussion of these verbs later in chapter 5). So it seems to be a robust generalization that, in Greek, epistemic and doxastic attitude verbs pattern on a par in selecting indicative and ignoring the speaker's model or what is or is not known in the common ground of C. What is actually the case seems to be compl etely irrelevant for doxastic verbs in Greek and does not affect mood selection. This holds for basically all other Romance languages, with the exception of Italian (Mari 2017), where we find a more variable pattern— to be discussed in the next chapter. The grammar, via mood, appears to overall distinguish between *strictly private* beliefs— which Mari 2017b calls 'solipsistic', which are 'strong' and select indicative (according to Mari, solispistic 'credere' deals with *credences* —, and more conjectural beliefs– which engage with C or other Ms and are therefore weaker. Mari 2017b calls these spaces *inquisitive* because, as we will see in the next chapter, they involve the common ground, and questions under discussions. Greek appears to lack inquisitive belief; doxastic verbs as a class behave classically.

The belief that Greek doxastic verbs express, thus, can be understood as strong belief, i.e. belief that is defined solely on the private space M(subject), and is immune to what is actually the case or what information is encoded in the common ground C. The *oti* selection reflects a dependency that expresses strong belief: the OTI morpheme will take the proposition denoted by the mebedded sentence, and will anchor it to M(subject) alone. The rest of the common ground, or the speeakers M(speaker) don't matter. For this reason, Giannakidou 2009, 2016 characterizes *oti* as a context *shifter*: the *oti* clause behaves as a main clause and counts as adding a proposition to the local epistemic space which is the main clause subject's.

2.2 Mood contributes anchoring rules

Because *oti* adds the proposition, M(subject) is veridical wrt it. Hence, *oti* being an indicator of veridicality means that it *anchors* p to M(subject) and anchoring with oti means adding p to M(subject). We will call this *Private Assert!*:

(34) C-OTI anchoring rule (AI): *Private Assert!*
i. Anchor C-OTI p to the veridical M(subject).
ii. Ignore C and M(speaker).
iii. Add p to the M(subject).

The anchoring rules we posit for mood is reminiscent of the *Now Anchoring* rules we posited for the future morphemes in Giannakidou and Mari (2017); as in that case, anchoring needs a syntactic host, and this is the particle *oti* position. Above, we postulate Private Assert! as having two components: (a) *oti* anchors p to the main subject's private space (context shift), and (b) adds p in the space which means adding p to M(subject). The concept of private assertion implies a structuring of the discourse as containing also multiple private spaces M, as opposed to the common ground. Recall the general conception of a context c containing M that we adopted:

(35) DF1: Model of an individual (Giannakidou 1999: (44))
Let c= <cg(c), W(c), M, s, h, w0, f> be a context.
An model M(i) ∈ M is a set of worlds associated with an individual i; i is the individual anchor.

The mood selection properties of strong doxastic verbs tell us that Ms can expand by adding propositions, just like uembedded assertions add to the context set W(c). Strong belief verbs, because they focus attention to just the private spaces, are prime candidates to take oti-complements. *Oti* is thus unnecessary in main clauses, where addition just happens in the common ground, and this explains easil, without any additional assumptions, the absence of oti in main clauses.

We proceed now to show the parallels with other verbs classes that take C-OTI complements. As the discussion develops, we will add the following rules:

(36) C-PU anchoring rule: *Presuppositional anchoring*
(i) Anchor C-pu p to veridical M(subject).
(ii) p is already in M(subject) or the common ground.

This captures the distribution of *pu* with the emotive factive verbs where the proposition is presupposed to be true in M(speaker) or in the common ground, and no assertive instruction is given. So, what is common in the two indicative C-PU and C-OTI is that they anchor p to the private veridical M(subject). Greek, crucially, makes a distinction between assertive and presuppositional anchoring, and this illustrates that the indicative mood is not isomorphic to assertion.

For subjunctive, we will propose *Non-veridical anchoring*:

(37) C-NA triggers AI: *Non-veridical anchoring*
i. Anchor C-na p to a nonveridical M: (M(subject), M(speaker,) or C.
ii. Allow interaction with C or M(speaker).

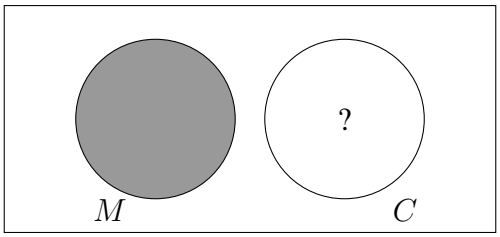
The first clause predicts subjunctive *na* whenever in M we have both p and non-p worlds; or when in interacting with C or other Ms it turns out that non-p is an option. Nonveridicality thus may arise in the private or in the public space.

Finally, we have inquisitive anchoring with embedded questions. Inquisitive anchoring is a special case of nonveridical anchoring, which we find in Italian with *inquisitive* belief (Mari, 2017).

(38) C-AN triggers AI: *Inquisitive anchoring*
Update C with $?p$

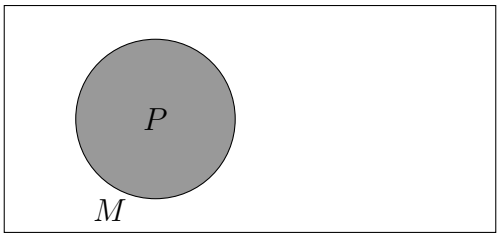
This is the anchoring with Greek *an* whether. Overall, anchoring captures that the mood particles depend on the higher verbs whose subjects provide M and whose lexical meaning will determine, as we see, whether M is veridical or nonveridical. Mood selection is thus not devoid of meaning, as Giannakidou 2016 argued, but encodes anchoring dependency. Here we can show in pictures what anchoring is (see also Mari, 2015,2017 for more discussion about possible spaces and their interactions, as well as chapter 4; here we focus on M).

(39) OTI-anchoring: C=M(subject). Update M(subject) with p. (this will be indicative (IND) anchoring in Italian)

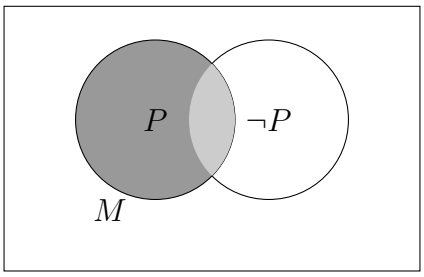


We see here that what it is being anchored is the private state of the epistemic agent.

(40) PU-Anchoring: C=M(subject).



(41) NA-anchoring: C= M; M is partioned into p and non-p worlds. (this will be subjunctive anchoring in Italian)



Only oti anchoring has the affect of updating M(subject) with p. Importantly, the carriers of veridicality and nonveridicality are components of the verb meanings, and the mood particles contribute the anchoring conditions we specify. This is a different approach from Giannakidou 2016, where it is argued that mood selection is purely featural agreement, e.g. a kind of (non)veridical concord, on a par with other kind of concord in grammar such as modal or negative concord. Our anchoring approach is also very different from earlier polarity approaches that treat mood choice in complement clauses as polarity licensing (see for an intreview Quer 2009). In those approaches, the sensitivity of mood morphemes reveals definedness conditions— which, when not met, produce fatal interpretative clash and failure, i.e. if we tried to use *na* after a verb of belief or dream, or *oti* after a verb of desire. A basic opposition in polarity is between positive polarity items (PPIs) and negative polarity items (NPIs). NPIs are sensitive to novneridicality (negation and downward entailment included) and need to be in the scope of nonveridical operators; PPIs, on the other hand, are attracted by veridicality, and want to avoid nonveridical contexts.

If, as we do now, mood selection is (non)veridical anchoring, we have an explicit contribution of mood morphemes without making them identical to polarity items.

Our account shares some similarities and differences with Farkas (2003). Farkas also uses updates of private stated. However, according to her, 'believe' itself is responsible for the update of p in what she calls the world-view of the epistemic agent. As for us, mood is responsible for anchoring p to the belief space. As for Farkas, mood is triggered by polarity properties and remains a polarity item.

Quer 2001 proposes instead to consider mood in a dialogical perspective, where subjunctive means, in essence, disagreement and lack of endorsement. We will return to the role of mood and the effects on the common ground when we discuss Italian in details.

2.3 Dream and fiction verbs

Fiction verbs such as *dream* and imagine also take OTI clauses. In this case, we understand M to be the set of worlds compatible with the subject's dream which we note M_{dream}:

(42) *Dream state of an individual anchor i* (Giannakidou 1999: (45))
An dream state M_{dream} (i) is a set of worlds associated with an individual i representing worlds compatible with what i dreams or imagines.

(43) a. O Nicholas onireftike oti/*na efije i Ariadne.
the Nicholas dreamt.3SG that.IND/that.SUBJ left.3SG the Ariadne.
b. Nicholas ha sognato che Ariadne è andata via.
Nicholas has dreamt that Ariadne be.3SG.PRES.IND gone away.
Nicholas dreamt that Ariadne left.

(44) O Nicholas fandastike oti/*na efije i Ariadne.
the Nicholas imagined.3SG that.IND/that.SUBJ left.3SG the Ariadne.
Nicholas imagined that Ariadne left.

(45) $[\![$Nicholas dreamt that $p]\!]^{w,M_{dream}(Nicholas)}$ is 1 iff:
$\forall w'[w' \in \mathrm{M}_{dream}(Nicholas) \rightarrow w' \in \lambda w''\{w'' \mid p(w'')\}]$

When someone dreams or imagines something, the relevant private space is the set of dream or imagination worlds. M_{dream} is, according to Giorgi and Pianesi 1996, a prototypical private space. What one dreams entails nothing about the real world. This is something expressed also in Farkas 1985, 1992: fictional reality replaces the actual one. A dream state, as can be seen, fully supports p, it is therefore veridical. It is interesting to note that indirect evidential marking also disappears in dreams and story-telling (e.g. in Turkish, Ozge Sarigul, pc.). This shows that the grammar treats fictional contexts as veridical and assertive, and it is no surprise that they select indicative. *Oti* anchors p to M_{dream} (subject), as expected, and adds the embedded proposition to it.

2.4 Verbs of assertion

For assertive verbs like leo (say), isxirizome (claim), following Giannakidou 1998, 1999, 2009, we view the model as conceptualizing the reported conversation (RC), illustrated below with the index RC. Under realistic assumptions, MRC(i) includes worlds different from the dream modeal or the epistemic model:

(46) Model of reported conversation for an individual (Giannakidou 1999: (47))
Let c= <cg(c), W(c), M, s, h, w0, f> be a context.

A model MRC(i) member of M is a set of worlds associated with an individual i representing worlds compatible with what x takes the reported conversation to be in the context.

(47) O Nicholas ipe oti/*na efije i Ariadne.
the Nicholas said.3SG that.IND/that.SUBJ left.3SG the Ariadne.
Nicholas said that Ariadne left.

(48) O Nicholas anakinose oti/*na efije i Ariadne.
the Nicholas anounced.3SG that.IND/that.SUBJ left.3SG the Ariadne.
Nicholas imagined that Ariadne left.

The assertive verb creates an embedded context that is assertive; and since it is not quotative, addition will be done to MRC, not to C. As said in Giannakidou 1998, 1999, "the models we employ here, though distinct, are all epistemic in a more general sense: what one dreams represents the state of belief while dreaming, what one takes the reported conversation to be represents one?s belief state regarding the reported conversation. So by saying that truth assessment is done with respect to an individual's model, we are saying that we are always relying on an individual's doxastic state broadly speaking."

2.5 Emotive factive verbs: non-assertive, presuppositional indicative

Let me start with our earlier observation that factive verbs (*ksero* know) are veridical; emotive factive verbs are also veridical. However, they select a special complementizer pu:

(49) O Pavlos lipate pu/*oti /*na efije i Roxani.
the Paul is-sad-3SG that left-3SG the Roxani
Paul regrets that Roxanne left.

Two questions arise with emotives, and we will only answer the first one here which is: why not *oti*? The second question has to do with the fact that emotive crosslinguistically– but not epistemic factives (know), may select the subjunctive. Regarding emotive verbs, there are three patterns:

(i) Languages that require subjunctive (Spanish, Italian, maybe French);
(ii) Languages that allow both subjunctive and indicative ((Brazilian) Portuguese, Catalan, Turkish);
(iii) Languages where emotives select indicative (Greek, Hungarian, Romanian, Bulgarian); the emotive complement may be distinguished in some other way as in Greek.

Given this variation, it becomes clear that, crosslingustically, the emotive class is flexible. From the nonveridicality perspective, emotives should simply not allow the subjunctive since they are factive and therefore veridical, hence the languages in (iii) are well-behaved. But we still need to explain the option of subjunctive in types (i-ii), and why there is a special marking with the emotive verb in Greek. We will take up the question of crosslinguistic variation in chapter 5.

An important observation about emotive verbs is that they are *presuppositional*. This goes back to the classical analysis of factives in Kiparski and Kiparski 1970. As with know, the idea is that emotives presuppose their complement to be true. Huddleston and Pullum 2002, however, give examples like below:

(50) Falsely believing that he had inflicted a fatal wound, Oedipus regretted killing the

stranger on the road to Thebes (Klein 1975, quoted in Gazdar 1979, p. 122).

Here, it is not entailed (i.e. it is not true in the actual world) that Oedipus inflicted a fatal wound. Egré 2008 offers similar examples:

(51) John wrongly believes that Mary got married, and he regrets that she is no longer unmarried. (Egré 2008: (30), citing earlier work by Egré and Schlenker).

These examples show that one can have an emotive attitude not only towards an actual fact, but also towards something that one *believes* to be a fact, but may not actually be a fact. In the normal case, we are happy or sad about something that we know happened; but one may believe that something happened (a believed fact) and then feel happy or sad about it. Hence, emotive verbs need not be veridical in the objective sense (as *ksero* know is) but subjectively, since they rely on the emotive subject?s belief of p. This renders the emotive subjectively veridical, just like belief and fiction verbs, and these verbs, as we saw, select the OTI indicative. Why, then, the special marking?

Giannakidou 2016 puts forth a expressive analysis of pu, but here we will propose something simpler: we will say that the PU update is presuppostional. PU anchors the embedded p to the veridical M(subject), but only if p is a fact or a perceived fact, i.e. if p is part of M(subject) or C already:

(52) C-PU anchoring rule: *Presuppositional anchoring*
(i) Anchor C-pu p to veridical M(subject).
(ii) p is already in M(subject) or the common ground.

The fact that Greek lexicalizes an assertive and a non-assertive distinction in the indicative suggests quite clearly that the indicative mood is not fully isomorphic to assertability, contrary to what most current accounts claim (e.g. Farkas 2003). The indicative in Greek (*oti, pos, pu* overall indicates *private anchoring*, i.e. anchoring to a private space. Belief, doxastic, memory, and imagination verbs are all construed strongly as veridical spaces anchored to the main clause subject. All other aspects of discourse– engagement with C, the speaker's M(speaker) are irrelevant for the Greek indicative.

Crucially, the verb *ksero* 'know' may also selects pu:

(53) O Pavlos kseri pu/oti /*na efije i Roxani.
the Paul knows.3SG that left-3SG the Roxani
Paul knows that Roxanne left.

The *pu* selection appears to be subject to restrictions. Specifically, it can't be used in the following context where the speaker doesn't know p:

(54) Question: How much did that book cost?
Answer: Ksero *pu/oti kostise 25 dollaria.
know.1SG that cost-3SG 25 dollars.
I know that it cost 25 dollars.

In this context, the person asking the question does not know how much the book costs. Hence that the book cost 25 dollars is not known in the common ground, i.e. it is not a fact. In this case, *pu* cannot be used. If the *pu* update requires, as we are arguing, that p be already in the M(subject) or C, the restriction above is expected. *Pu* becomes relevant again when we consider memory verbs which also select *pu*, and are subject to similar restrictions.

2.6 Perception: dual pattern

Verbs of perceptions such as vlepo (see), akouo (hear) take *oti* complements:

(55) O Nicholas idhe oti/*pu/*na efije i Ariadne.
the Nicholas saw.3SG that.IND/that.SUBJ left.3SG the Ariadne.
Nicholas saw that Ariadne left.

(56) O Nicholas akouse oti/*pu/*na efije i Ariadne.
the Nicholas heard.3SG that.IND/that.SUBJ left.3SG the Ariadne.
Nicholas heard that Ariadne left.

Pu is of course also excluded since the perception complement is not presupposed. The complement here is in past tense, and so is the main verb. In (XX) Nicholas saw the event of Ariadne leaving, and heard that Ariadne left. In both cases, it can be understood that the embedded propositions are to be added to the M(i) that corresponds to what Nicholas saw and heard. With perception verbs thus we have a memory $\mathrm{M}_{perception}$ (i). M_{memory} (i) contains what i remembers. One would view $\mathrm{M}_{perception}$ (i) as independent from the default epistemic M(i), or we can think of it as a subspace of it, consistent with i's visual and audial memories. We can also view the two as distinct Ms. The truth condition is in any case the expected veridical:

(57) $[\![$Nicholas idhe/akouse oti efije i Ariadne$]\!]^{w,M_{memory}(Nicholas)}$ is 1 iff:
$\forall w'[w' \in \mathbf{M}_{perception}(Nicholas) \rightarrow w' \in \lambda w''\{w'' \mid p(w'')\}]$

At the same time, it is privately asserted in $M_{perception}$ that p, which means that p is added to $\mathrm{M}_{perception}$ (Nicholas).

Interestingly, these verbs also allow na complement with non-past to make reference to ongoing events directly perceived by the subject:

(58) O Nicholas vlepi oti/na fevgi i Ariadne.
the Nicholas see.3SG that.IND/that.SUBJ leave.NONPAST.3SG the Ariadne.
Nicholas is looking right now at Ariadne leaving.

(59) O Nicholas akoui oti/na fevgi i Ariadne.
the Nicholas hear.3SG that.IND/that.SUBJ leaveNONPAST.3SG the Ariadne.
Nicholas is hearing right now Ariadne leaving.

The triggering of *na* implies engagement with C or M(speaker), and can be used in case the speaker in fact knows that Nicholas has the wrong perception.

(60) O Nicholas vlepi tin Ariadni *oti/na fevgi, alla
the Nicholas see.3SG the Ariadne that.IND/that.SUBJ leave.NONPAST.3SG the
stin pragmatikotita pi geni mono ston kipo
Ariadne.
Nicholas is looking right now at Ariadne leaving, but she is only going to the garden.

(61) O Nicholas akoui tin Ariadne *oti/na fevgi, alla
the Nicholas hear.3SG the Ariadne that.IND/that.SUBJ leaveNONPAST.3SG the
afti mono metakinise ta epipla
Ariadne.
Nicholas is hearing right now Ariadne leaving, but she is only moving the furniture.

We see that in this case, the *oti* version is out, consistent with our characterization of *oti* as veridical and adding to M(subject). We will come back to this pattern in the discussion of *na* in

section 3.

2.7 Memory verbs: triple selection

(62) O Nicholas thimithike oti/*na i Ariadne efije xthes.
the Nicholas remembered.3SG that.IND/that.SUBJ the Ariadne left.3sg. yesterday.
Nicholas remembered that Ariadne left yesterday

With memory verbs we have a memory $\mathrm{M}_{memory}\ (i)$. $\mathrm{M}_{memory}\ (i)$ contains what i remembers. One would view $\mathrm{M}_{memory}\ (i)$ as independent from the default M(i), or we can think of it as a subspace of it, consistent with i's memories. The truth condition is the expected veridical:

(63) $[\![$Nicholas thimithike oti efije i Ariadne$]\!]^{w,M_{memory}(Nicholas)}$ is 1 iff:
$\forall w'[w' \in \mathrm{M}_{memory}(Nicholas) \rightarrow w' \in \lambda w''\{w'' \mid p(w'')\}]$

At the same time, it is privately asserted that p, which means that p is added to M_{memory} $(Nicholas)$.

Interestingly, they also license subjunctive with present tense and embedded nonpast, like the perception verbs we saw earlier:

(64) O Nicholas thimate oti/*na ekleise ton porta.
the Nicholas remembered.3SG that.IND/that.SUBJ closed.3sg. the door.
Nicholas remembered that he closed the door.

(65) O Nicholas thimate na kleini ton porta, alla den ine
the Nicholas remembered.3SG that.IND/that.SUBJ closed.3sg. the door.
sigouros.

Nicholas remembered closing the door, but he is not entirely sure.

The na-version requires a context where Nicholas is not fully sure about his memory, and allows some doubt. He is thus in a nonveridical state.

Finally, memory verbs can take *pu* complement. In this case, just like ksero 'know', they can't be used in the following context where the speaker doesn't know p:

(66) Question: How much did that book cost?
Answer: Thimame *pu/oti kostise 25 dollaria.
remember.1SG that cost-3SG 25 dollars.
I remember that it cost 25 dollars.

In this context, the person asking the question does not know how much the book costs. Hence that the book cost 25 dollars is not known in the common ground. In this case, *pu* cannot be used. This supports our idea that pu requires that p is part of M(subject) or the common ground. If the pu update requires, as we are arguing, that p be already in the M(subject) or C, the restriction above is expected. Out of the blue, the speaker can actually say:

(67) Thimame pu/oti to vilvio kostise 25 dollaria.
remember.1SG that the book cost-3SG 25 dollars.
I remember that the book cost 25 dollars.

In this case, the memory corresponds to common knowledge. We will talk more about these cases in chapter 5.

2.8 Conclusion

Having concluded the discussion of the indicative classes, here are our conclusions. Greek employs two indicative particles— oti, pos and pu. This fact is not redundant but revealing of an assertive and a non-assertive variant of IND.

(68) C-OTI triggers rule: *Private Assert!*
i. Anchor C-OTI p to veridical M(subject).
ii. Ignore C and M(speaker).
iii. Add p to the M(subject).

Oti anchors p to the main subject's private space (context shift), and (b) privately asserts p in the space which means adding p to M(subject). We have designated, following Giannakidou's earluer work, that the basic epistemic M(i) can come in different variants to encode what one sees, hears, or remembers, as well as what is being said. In all cases, C-OTI denotes a veridical sentence wrt M(subject), and performs *private assertion*, by adding p to M. The concept of private assertion implies a structuring of the discourse as containing also multiple private spheres, as opposed to the common grounds. The mood selection properties of strong doxastic verbs tell us that such structure is necessary.

The emotive factive verbs, on the other hand, presuppose that veridicality of p either in C, or in M(subject). Since veridicality of p is presupposed, p is already present in M(subject) and cg(C), and cannot be added. PU is therefore a non-assertive IND, and there is no addition update. PU simply anchors p to the veridical common ground.

(69) C-PU anchoring rule: *Presuppositional anchoring*
(i) Anchor C-pu p to veridical M(subject).
(ii) p is already in M(subject) or the common ground.

We saw, incidentally, that even epistemic factives such as *ksero* 'know' can take a *pu* complement. The fact that Greek lexicalizes an assertive and a non-assertive distinction in the indicative suggests quite clearly that the indicative mood is not fully isomorphic to assertability, contrary to what most current accounts believe (e.g. Farkas 2003). The indicative in Greek overall indicates private anchoring. Belief, doxastic, memory, and imagination verbs are all construed strongly as veridical spaces anchored to the main clause subject. All other aspects of discourse– engagement with C, the speaker's M(speaker) are irrelevant for the Greek indicative.

We move on now to discuss subjunctive complements.

3 Subjunctive: epistemic weakening, nonveridical anchoring

Building on our earlier works, we will start with the premise that subjunctive is a signal of a nonveridical anchoring. While the sensitivity of subjunctive, as a category, can be shown very clearly for Greek, it has not always been fully appreciated in discussions of Romance, typically because emotive factive verbs, in contrast to Greek, in Romance select subjunctive. At the same time, it has also been been argued that nonveridicality plays a significant role in Romance:

"Thus the selection of indicative or subjunctive for complement clauses in Portuguese seems to follow from two factors: nonveridicality and epistemic modality. The indicative is selected for veridical contexts, or if the attitude towards the complement proposition is of epistemic nature. The subjunctive is selected otherwise. It does not seem to be associated with a specific kind of modality." (Marques 2010, p. 153)

The above reflects a view of the indicative in the spirit developped in section 2: as indicator of veridicality, which now is anchoring to a veridical private space M. The subjunctive is presented as the otherwise condition, and cannot be simply identified with a single label such epistemic or bouletic modality since it is used with both epistemic and dynamic modals. Giannakidou 2016 further shows that the effect of optional the subjunctive is sometimes epistemic (in the questions and relative clauses; Giannakidou 2014), but it can also be bouletic makes it impossible to say that the subjunctive itself associates with one modality?because it doesn?t.

Hence, echoing Giannakidou 2016: "if we are in the search for the holy grail of one modality for the subjunctive, we are not in luck. But if we look closer, we see that there is indeed one underlying property shared by all subjunctive contexts: they are all nonveridical. Nonveridical domains are sets of worlds partitioned into p and non-p worlds, and the partition could (but doesn?t have to) be the result of ordering (e.g. ordering sources with modals). And, though not all subjunctive contexts can be identified with an ordering, they are all nevertheless partitioned into p and non-p spaces." It is in this sense that we take it that the subjunctive is an indicator of a nonveridical M(i).

Following the theory we developped for the indicative, we propose here that the specific contribution of the subjunctive is *Non-verdical anchoring*, defined below:

(70) C-NA anchoring rule: *Non-veridical anchoring*
i. Anchor C-na p to a nonveridical M (M(subject), M(speaker,) or C.
ii. Allow interaction with C or M(speaker).

This predicts subjunctive na in two cases: (i) whenever in a private M we have both p and non-p worlds; or (ii) when M, in interacting with C, it turns out that non-p is an option. The latter is an overwhelming option with doxastic verbs in Italian, as we see in the next chapter, but we also find it with Greek FIND, memory verbs, and it responsible for subjunctive after implicative verbs too. The subjunctive thus produces *epistemic weakening*, which means that it breaks the homogeneity of M. [3] We observed the epistemic weakening produced in MUST in chapter 2; here we generalize to show that weakening is always present when we use the subjunctive and it can be produced within a single M, or in the interaction between M and C.

3.1 Verb classes that trigger the subjunctive

Verbs selecting subjunctive belong to the following classes.

(71) Subjunctive verbs in Greek
a. volitionals: thelo (want), skopevo (plan)
b. directives: dhiatazo (order), simvulevo (advise), protino (suggest),
c. modal verbs: prepi (must), bori (may)
d. permissives: epitrepo (allow); apagorevo (forbid)
e. implicatives: katorthono (manage), anagazo (force)

(72) Subjunctive verbs in Italian
a. volitionals: volere (want),
b. directives: ordinare (order), consigliare (suggest)

[3] Giannakidou 2013 introduced the term in her analysis of subjunctive in relative clauses where it causes uncertainty about the existence of a value for the NP. She furthers says that "Epistemic weakening is both a nonveridical and evaluative effect in the sense that affects the strength of the initial evaluation of the sentence (see especially Trnavac and Taboada's 2012 conclusions)". (Giannakidou 2013: XX).

c. modal verbs: è necessario (must), è posssibile (may), bisogna (must).
d. permissives: impedire (forbid)
e. doxastic credere (believe), pensare (thik)

As we have already noted, and we discuss in detail in the next chapter, almost all verbs, with the notable exception of *sapere* ('knwo') license both moods in Italian.

Volitional verbs licenses subjunctive mood in Greek and Italian (73).

(73) a. Thelo na kerdisi o Janis.
want.1SG that.SUBJ win.NONPAST.3SG the John.
b. Voglio che Gianni vinca.
Want.1SG.SUBJ that John win.3SG.SUBJ.
I want John to win.

A volitional component is not necessary for the subjunctive itself, e.g. modal verbs in both epistemic (74) (note the past tense in the embedded clause) and dynamic uses select the subjunctive.

(74) a. Bori/Prepi na kerdise o Janis.
Can/Must that.SUBJ win.PAST.3SG the John.
It is possible that he has won.
b. È possibile che abbia vinto.
Be.3SG.IND possible that have.3SG.SUBJ won.
It is possible that he has won.

(75) a. Ine pithano na kerdisi.
is.3sg possible subj win.nonpast.3sg.
He may win.
b. È possibile che vinca.
Be.3SG.IND possible that win.3SG.SUBJ.
He may win.

As discussed earlier, logically, *May/can* p does not entail p, and *must* is also nonveridical thus weaker than an indicative unmodalized assertion since must p does not entail p either, as we saw.

There are also temporal connectives BEFORE, WITHOUT, exs.

Also, subjunctive in relative clauses, with negation, with free choice items: to be discussed in chapter 5.

A subjectively nonveridical function imposes non-homogeneity on the epistemic state: it imposes that there is at least one $\neg p$ world.

(76) Def. 5. *Subjective nonveridicality*
A function F that takes a proposition p as its argument is subjectively nonveridical with respect to an individual anchor i an epistemic state $M(i)$ iff:
$\exists w' \in \mathbf{M}(i) : \neg p(w') \wedge \exists w'' \in \mathbf{M}(i) : p(w'')$.

Recall that subjective nonveridicality thus means that i is in a state of uncertainty with respect to p. M(i) as a whole does not support p: some worlds in M(i) support p and some others don't. This immediately suggests a link between uncertainty operators and the subjunctive selecting verbs (e.g. modals, volitionals) and subjective nonveridicality.

Subjective (non)veridicality can be extended to characterize the epistemic states themselves. A veridical epistemic state is a non-partitioned, homogenous epistemic state that supports p. A nonveridical epistemic state, on the other hand, is a space partitioned into p and $\neg p$ worlds.

(77) Def. 6. *(Non)Veridicality of epistemic states and Support*
An epistemic state (a non-empty set of worlds) M(i) relative to an individual anchor i is:
   a. *Veridical* with respect to a proposition p iff all worlds in M(i) are p-worlds. In this case, M(i) *fully supports p*.
   b. *Nonveridical* with respect to a proposition p iff at least one world in M(i) is a $\neg p$ world. In this case, M(i) *partially supports p*.
   c. *Antiveridical* with respect to a proposition p iff all worlds in M(i) are $\neg p$ worlds. In this case, M(i) *does not support p*.

A veridical epistemic state is a non-partitioned, homogenous epistemic state, a state that fully supports p. A knowledge or belief state is veridical. A nonveridical state M(i), on the other hand, is defined as one that contains at least one $\neg p$ world. It is a non-homogenous, partitioned state, only partially supporting p. When all the worlds are $\neg p$, the state is *antiveridical*, as with negative and counterfactual assertions and the state does not support p. Antiveridicality characterizes generally non-assertive moods such as the optative and imperative, since at the issuing of optative and imperative the speaker believes that p doesn't hold.

We proceed now with the major selection cases, in a fashion parallel to what we did for indicative. We will not discuss the nonveridicality of modals since we did that extensively in the previous chapter.

3.2 To want and to hope

Want and *hope* are very interesting, particularly in the way they contrast. *Want* uniformly selects the subjunctive in the languages we know, but *hope* can appear with either mood. The two lexical entries differ in a number of ways. First, as acknowledged in Portner and Rubinstein (2012) and Anand and Hacquard (2013), unlike *want*, *hope* has an epistemic layer. Portner and Rubinstein say that with *hope* the attitude holder must be *cognizant* whereas with *want* she is not. Anand and Hacquard argue that *hope* has an uncertainty component that, which in our framework means that they have a nonveridical epistemic space. An important related difference between *hope* and *want* is that *hope*, can be past, or future oriented, whereas *want* is only future oriented (Farkas 1992, Laca 2008). This holds for all three languages:

(78) a. Spero/#Voglio che sia stato malato.
Hope.1SG/Want.1SG that be.3SG.SUBJ been sick.
I hope/want that he has been sick.
   b. Spero/#Voglio che sia malato.
Hope.1SG/Want.1SG that be.3SG.SUBJ sick.
I hope/want that he is seeing her.
   c. Spero/Voglio che venga.
Hope.1SG/Want.1SG that come.3SG.SUBJ.
I hope/want that he comes.

(79) a. Elpizo/#thelo na tis arese to fagito.
Hope.1SG/Want.1SG that her like.past.3sg the food.
I hope/#want that she liked the food.

b. Elpizo/thelo na tis aresi to fagito.
Hope.1SG/Want.1SG that her like.Nonpast.3sg the food.
I hope/#want that she liked the food.

Regarding want, the semantics assumed typically rely on Heim 1992 (herself relying on earlier work by Stalnaker). When I want something, this means that I envision the world to be as fulfilling my desire, but I also know that this might not be the case. The truth condition for *thelo* 'want' requires that the intersection between M(subject) and p be nonempty. In addition, the volitional verb imposes an ordering "more desirable" such that the worlds in which p is true are more desirable than the worlds in which p is not true.

(80) a wants that f is true in w_0 iff $\forall w \in Dox(a)(w_0) : f(w)$
every f-world maximally similar to w is more desirable to a in w_0 than any non-f world maximally similar to w.

Dox (a) (w) is the accessibility function determining a set of doxastic (epistemic) alternatives for a; in other worlds, it is MB (x). Villalta (2008) proposes the following semantics for want:

(81) $[\![\text{want}C]\!]^g(p)(a)(w)$ = 1 iff
$\forall q\, q \neq p \,\&\, p \in g(C) Sim'_w(Dox(a(w) \subset p >_{a,w,Simw'} (Doxa(w) \subset q)$

We propose the following:

(82) $[\![i$ thelo 'hope' $p]\!]^{i,M_{epistemic}(i),M_{hope}(i)}$ is true iff:
a. $\exists w' \in \mathbf{M}_{epistemic}(i) \neg p(w') \wedge \exists w'' \in \mathbf{M}_{epistemic}(i) p(w'')$ (SNV), and
b. the p worlds are more desirable by i than the non-p worlds.

If i wants p, not all worlds in M(i) are p-worlds. In fact, the wanter considers both possibilities, p and non-p worlds, and prefers the former. This places nonveridicality at the heart of the truth condition for desire. If i wants p, in the doxastic model of i there are p and non-p worlds, as indicated above. The doxastic space is future oriented as is typical with the future particle *tha* too. The orientation is due to the presence of non-past, as discussed in chapter 2.

Elpizo 'hope' has a similar nonveridical structure, it therefore selects the subjunctive. However, oti is also possible, with embedded *tha*, never with past:

(83) a. Elpizo na#oti tis arese to fagito.
Hope.1SG that.SUVJ her like.past.3sg the food.
I hope / #want that she liked the food.
b. Elpizo oti tha tis aresi to fagito.
Hope.1SG that.IND FUT her like.Nonpast.3sg the food.
I hope that she will like the food.

It seems fair to say, then, that the subjunctive is the default for elpizo ''hope' in Greek. The possibility of embedding the future *tha* under *oti* is also interesting. Such embdedding as generally allowed:

(84) Ipe oti tha tis aresi to fagito.
said.1SG that.IND FUT her like.Nonpast.3sg the food.
She said that she will like the food.

(85) Pistevi oti tha tis aresi to fagito.
believe.1SG that.IND FUT her like.Nonpast.3sg the food.
She believes that she will like the food.

To go back to elpizo, the possibility of oti suggests anchoring to a private epistemic space:

(86) $[\![i$ elpizo 'hope' $p]\!]^{i,M_{epistemic}(i),M_{hope}(i)}$ is defined iff
a. $\exists w' \in \mathbf{M}_{epistemic}(i) \neg p(w') \wedge \exists w'' \in \mathbf{M}_{epistemic}(i) p(w'')$ (SNV).
If defined,
b. $[\![i$ hope $p]\!]^{i,M_{epistemic}(i),M_{hope}(i)} = 1$ iff
$\forall w''' \in \mathbf{M}_{hope}(i) p(w'''')$.

Here we see posit a two dimensional meaning for elpizo 'hope'. The truth conveys veridicality, but there is also a presupposition that WANT lacks, i.e. the cognizant component of hope. This is a presupposition of epistemic uncertainty, as seen above. HOPE thus appears to be our first case of 'mixed' veridicality. Emotive factives are another one, and we will discuss them in the next section. In the case of mixed veridicality, we expect variation in selection as is indeed the case.

Of course, verbs meaning hope and want, and generally directive and future oriented verbs, are also objectively nonveridical, since they do not entail that p is true in the actual world at the present time.The same holds for modal verbs. So, objectively nonveridical attitudes such as all future oriented directive verbs, will always select the subjunctive.

We end up with a flexible system that acknowledges sensitivity of mood particles to the (non)veridicality of assertion or the presupposition, while at the same time acknowledging general tendencies in the grammar of Greek n that favor the indicative or the subjunctive as defaults.

3.3 Directives verbs: suggest, ask

(87) $[\![i$ protino 'suggest' $p]\!]^{i,M_{epistemic}(i),M_{hope}(i)}$ is true iff:
a. $\exists w' \in \mathbf{M}_{epistemic}(i) \neg p(w') \wedge \exists w'' \in \mathbf{M}_{epistemic}(i) p(w'')$ (SNV), and
b. the p worlds are preferred by i than the non-p worlds.

(88) $[\![i$ zito 'askt' $p]\!]^{i,M_{epistemic}(i),M_{hope}(i)}$ is true iff:
a. $\exists w' \in \mathbf{M}_{epistemic}(i) \neg p(w') \wedge \exists w'' \in \mathbf{M}_{epistemic}(i) p(w'')$ (SNV), and
b. the p worlds are preferred by i than the non-p worlds.

3.4 before, without

3.5 Implicatives

Implicative verbs, at first glance surprising, appear to select subjunctive. This holds in Greek but is also true of Romance more broadly (Quer 1998, 2001 for Spanish and Catalan). Consider a sentence with manage ?kataferno?:

(89) I Maria katafere na ftiaksi to aftokinito.
Maria managed.3sg SUBJ fix.3sg the car.
Maria managed to fix the car.

Now consider the classical analysis of Kartunnen:

(90) Kartunnen 1971
Manage p entails p, and presupposes that it took (some or considerable) effort to do p.

Since manage p entails p, manage appears to be veridical. However, manage verbs select the subjunctive systematically in a number of languages. Why is that?

The key to understanding this prima facie unexpected behavior of manage verbs is to appreciate the effort component: effort implies trying, and trying to do p does not entail having done p at every instance of trying. Giannakidou 2011 suggests then that the implicative meaning MANAGE is a complex meaning TRY to do p and p. Some motivation for this comes from the fact that, at least in Greek, the implicative appears with ke ?and?, a paratactic complement (Giannakidou 1998, Giannakidou and Staraki 2013):

(91) I Maria katafere ke eftiakse to aftokinito.
Maria managed.3sg and fix.PNP3sg to car.
Maria tried [to fix the car] and did fix the car.

The occurrence of this paratactic complement with ke, remained mysterious in the Greek literature, but it is suggestive of the richer implicative meaning , and which has two components: a trying event, and a successful result state. Giannakidou 2011 proposes the following:

(92) Implicative meaning $[\![x$TRY to DO p and non p$]\!]$ is true iff
$\exists t \exists e[[try(e, x, dop) \wedge e \subseteq t \wedge agent(e, x)] \wedge \exists s \exists t'[t \prec t'$BE-fixed(car, $s, att')]]$

From this condition, it follows that the car is fixed only at the time t?, which follows the time t of the trying event. If this is the meaning of MANAGE, then in assessing the truth of a sentence MANAGE p, the speaker is also accessing the trying times (or world/time pairs), prior to the final result, and at the trying worlds/times there is no fixing the car. In the epistemic model of the x too, it is not the case that every world is such that it x fixed the car: there are worlds Wtry? the belief worlds of x at the time of trying?where x has not yet fixed the car. The car being fixed is the result state temporally following the trying event, and from the point of view of x, the fixing of the car does not characterize all his belief worlds: only the ones after the end state. Hence:

(93) If manage (x, to do p) is true in a context c, then $\exists W[W_{try} \subset M_B(x) \wedge W_{try} \cap p = \emptyset]$,
where W_{try} are the belief worlds of x at the time of trying;
Thus, if manage (x, to do p) is true in a context c, then it is not the case that $M_B(x) \subseteq p$.
(nonveridicality)

So, belief states are nonveridical with manage, and only the end state contains the knowledge inference that p is true. Kartunnen insisted that ?John managed to fix the car is not equivalent to the simple assertion John fixed the car. It is important to note that the complex implicative meaning in (93) characterizes a larger set of action sentences in Greek as well as English, including actions that involve ability predicates such as ABLE.[4] Other implicatives such us FORCE and ALLOW exhibit the same truth condition.

[4]Mari (2017a) also offers a handle to explain why implicative can license the subjunctive, by proposing that they have a modal, counterfactual presupposition.

4 Conclusions

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