MODERN GREEK TENSE IN MAIN AND *NA* SUBORDINATED CLAUSES: AN LFG/XLE TREATMENT

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Abstract

In the framework of a Modern Greek LFG/XLE grammar development project at ILSP/"Athena" RC, we implemented a novel multilevel analysis of tense in main and *na* subordinated clauses. Existing analyses of tense and the subjunctive mood in Modern Greek do not cover the entirety of tenses available in this language, do not provide a unified analysis of the tense system and the subjunctive mood and do not encode facts of sequence of tenses in subordinated clauses with verbs in the subjunctive mood. Our proposal draws on Reichenbach's ideas and provides a unified analysis of a wide range of tense and subjunctive data. We rely on corpus data retrieved from the HNC (http://hnc.ilsp.gr/).

1. Introduction

Representation of tense is one of the most serious problems that we have encounterd in our ongoing effort to develop a corpus-inspired grammar of Modern Greek. There exists a vast literature on the nature of *na* subordinated clauses of Modern Greek (Philippaki-Warburton et al. 1984, Holton et al. 1997), however the focus is more on the nature of *na* and the problems it poses to linguistic theory rather than on an organised and detailed description of phenomena such as the number of tenses available and the sequence of tenses. Here we report on a novel analysis and representation of grammatical tense in Modern Greek that we used in our grammars. Our approach is novel in that it accommodates in a unified system all the verb forms/tenses that support a main declarative clause in Modern Greek (including all the verb forms traditionally considered as tensed plus two more forms) as well as the manifestations of the subjunctive mood in *na* subordinated clauses.

The paper is structured as follows. In Section 2 a brief overview is given of the verb types that have been attested in main declarative clauses retrieved from the HNC. In Section 3, the characteristic semantic contribution of each of the verb types is briefly presented. The proposed analysis of Modern Greek grammatical tense is presented in Section 4. In Section 5 the analysis is shown to accommodate an enriched set of grammatical tenses as compared to the set of tenses discussed in standard literature of Modern Greek. In Section 6 the relation of the proposed analysis to Reichenbach's approach (1974) is discussed. How subjunctive can be accommodated in the proposed analysis of grammatical tense is discussed in Section 7. In Section 8 we introduce the LFG/XLE implementation and the discussion is concluded in Section 9.

2. The verb types that support main clauses in Modern Greek

The verb types that support main clauses are summarized in Table 1. We use the regular verb *paizw* (play) as a case study. Throughout this

document, we refer to each verb form (and the tense that it encodes) with the number assigned to it in Table 1. Some verb forms are synthetic (1-3) and others analytic (4-10).

Verb type	Greek Form	English Gloss	Comments
1	paizw	play/be playing	Present form: the 'base form' of the verb. Subject agreement. *
2	epaiza	was playing	Past imperfective form. Subject Agreement.
3	epaiksa	played	Past perfective form. Subject agreement.
4	tha paizw	will be playing	The particle *tha* (will) plus the *present form* of the verb. Subject Agreement.
5	tha paiksw	will play	The particle *tha* plus a verbal form that morphologically coresponds to the past perfect subjunctive.**
6	tha epaiza	would play	The particle *tha* plus the *past perfective form* of the verb. Subject Agreement.
7	echw paiksei	have played	The base form of the auxiliary *echw* (have) plus the third person singular of the "subjunctive". *echw*: Subject Agreement. Verb form: indeclinable.
8	eicha paiksei	had played	The past form of the auxiliary *eicha* (had) plus the third person singular of the "subjunctive". *eicha*: Subject Agreement. Verb form: indeclinable.
9	tha echw paiksei	will have played	The particle *tha* plus the base form of the auxiliary *echw* plus the third person singular of the "subjunctive". *echw*: Subject Agreement. Verb form: indeclinable.
10	tha eicha paiksei	would have played	The particle *tha* plus the past form of the auxiliary *echw* plus the third person singular of the "subjunctive". *eicha*: Subject Agreement. Verb form: indeclinable.

Table 1. Analysis of verbal tenses in Modern Greek.

* "Subject Agreement" is a short hand for "the auxilary/verb form agrees with the subject in person and number".
**Past perfect subjunctive was available to older versions of the Greek language. In Modern Greek, this "subjunctive" is exclusively used to form analytical verb forms, it never occurs on its own and gives Subject Agreement.

We would like to note here that Table 1 contains two verb forms that are not usually listed in the relevant literature (Triantafullidhs:146, M.Tzevelekou & V.Kάntzou & S.Stamoulh, 2013:112) as encoding tenses, namely the types 6 and 10. We will discuss those two tensed verb forms in Section 5.

3. Brief description of the characteristic semantic function of the 10 verb types

In this section we briefly describe how each of the verb types in Table 1 stands for a member of the grammatical tense system of Modern Greek, therefore it should be accommodated in the unified representation system of tense. As a working definition of "Grammatical tense" in MG we adopt the one proposed by Mozer (2009:15), who defines tense as 'the grammatical category that locates a situation in time in order to indicate when the situation takes place'. Drawing on corpus (HNC) data, we bring evidence that each grammatical tense type in Table 1 has a characteristic semantic function in language that cannot be fullfilled by another verb type - of course, there are other 'semantic functions' that overlap (Klairhs & Babiniotis, 2005, Mozer, 2009). The idea that each verb form has to fulfill a characteristic semantic function is in accordance with the principle of language economy (Babinioths 1998, 114-115, Martinet 1973, 201-206).

A. Verb Type 1 (enestos "present'-the "base" form)

(1) **Trww/**   *ephaga/   *eicha faei   auth th stigmh (Vt1)[1]
    eat.Vt1.1SG/ *eat.Vt3.1Sg/   *eat.Vt8.1SG   at this moment
    "I am eating/*ate/*had eaten right now."

Present is the only tense to indicate that an action/event/situation (in what follows we will use the term 'event' as a generic term) takes place at the moment of speaking. The beginning of the event is located somewhere in the past and its end somewhere in the future but both the beginning and the end time are undefined. The speaker focuses only in the event at that specific time.

B. Verb Type 7 (parakeimenos) vs Verb Type 2 (aoristos)

(2) **Echei teleiwsei** oles tis ergasies tou. (Vt7)
    finish.Vt7.3Sg   all his homework.
    "He has done his homework."

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[1] Verbs will be glossed according to the verb types in Table 1; 'Vt1' stands for verb type 1, etc.

(3) **Teleiwse** oles tis ergasies tou. (Vt3)
　　finish.Vt3.3Sg　all his homework.
　　"He did his homework."

(4) ***Echei teleiwsei** oles tis ergasies tou molis twra. (Vt7)
　　*finish.Vt7.3SG　all　his homework　right now.
　　"He has just done his homework."

(5) **Teleiwse** oles tis ergasies tou molis twra. (Vt3)
　　finish.Vt3.3SG　all his homework　right now.
　　"He just did his homework."

(6) ***Echw archisei** *na* ginomai sunaisthhmatikos sthn efhveia. (Vt7)
　　*start.Vt7.1SG　to　become.Vt1.1SG emotional in my youth.
　　"I started being sentimental in my youth."

(7)**Archisa** *na* ginomai sunaisthhmatikos sthn efhveia. (Vt3)
　　start.Vt3.1SG　to become.Vt1.1SG emotional　in my youth.
　　"I started being sentimental in my youth."

　　　　Verb type 7 denotes an event completed in the past with consequences that reach the speaker's time (the present). In (2) the emphasis is on the results of the event and not on setting the exact time at which the event took place, therefore verb type 3, but not verb type 7, can combine with temporal determinations expressing near-immediate past (4), (5). It can also combine with specific clear time reference (6), (7).

C. Verb Type 2 vs Verb Type 3 vs Verb Type 8

(8) Chtes otan **pires** tilefono diavaza Logikh. (Vt2)
　　Yesterday when take.Vt2.2SG call　study.Vt2.1SG Logics.
　　"When you called yesterday I was studying Logics."

(9) Chtes **diavasa** Logikh. (Vt3)
　　Yesterday study.Vt3.1SG　Logics.
　　"Yesterday I studied Logics."

(10) **Eicha paei** gia ipno otan egine o seismos. (Vt8)
　　go.Vt8.1SG　for sleeping　when　happen.Vt3.3SG　the earthquake.
　　"I had gone to bed when the earthquake took place."

Verb type 3 is used to describe an event that was completed in the past with no reference to its duration (9). Duration or repetitions are expressed with verb type 2 (8). Thus, the difference between verb type 2 and verb type 3 is that verb type 2, but not verb type 3, is used when one focuses on the internal organization of the event therefore the difference is an aspectual one. Lastly, verb type 8 (past perfect) denotes that the event described by the verb was completed before a certain point of time (10).

(11) **Eiche teleiwsei** o agwnas, otan   eftase   sto ghpedo. (Vt8)
     finish.Vt8.3SG the game   when   come-Vt3-3SG to the court.
     "The game was over already when she came to the court."

(12) **Teleiwse**   o   agwnas otan   eftase   sto ghpedo. (Vt3)
     finish.Vt3.3SG the game   when come.Vt3.3SG to the court.
      "The game was over when she came to the court."

(13) **Teleiwne**   o   agwnas otan   eftase   sto ghpedo. (Vt2)
     finish.Vt2.3SG the game   when come.Vt3.3SG to the court.
     "The game was about to be over when she came to the court."

(11), (12), (13) do not share the same denotation. (11) says that the game was over before Mary arrived at the court, (12) that the game was over exactly when Mary arrived at the court and (13) that when Mary arrived at the court, the game was about to finish.

D. Verbs with *tha* : Verbs types 4, 5, 6, 9 and 10

(14) **Tha paizw**   podosfairo   gia panta. (Vt4)
     play.Vt4.1SG soccer   forever.
     "I will be playing soccer forever."

(15) **Tha paiksw**   basket   mono   gia shmera. (Vt5)
     play.Vt5.1SG basket   only   for today.
     "I will play basketball only today."

(16) O athlhths   **tha epaize**   me enesh. (Vt6)
     The athlete.NOM.SG   play-v6-3SG   with injection.
     "The athlete would play with an injection."

(17) Otan   ertheis,   o Nikos **tha echei fugei** gia th douleia. (Vt9)
     When   come.Vt2.2SG, the Nick leave.Vt9.3SG   from the work.
     "When you arrive tomorrow, Nick will have been off to work."

(18) Oi politikoi **tha eichan upograpsei**   prin th cthesinh diaskepsh. (Vt10)
   The politicians sign.Vt10.3PL   before the yesterday conference.
   "The politicians would have signed before the yesterday conference."

   Both verb types 4 (14) and 5 (15) express an event that will take place in the future. Their difference is of an aspectual nature: verb type 4 expresses duration and repetition while verb type 5 does not.
   Verb type 6 is not included in the traditional list of tenses (Triantafullidhs,1941, M.Tzevelekou & V.Kάntzou & S.Stamoulh, 2013, Klairhs & Babiniotis, 2005). On the other hand, our corpus data show that it can support a main clause (16). Interestingly, verb type 6 is morphologically marked for both past and "future" (the particle *tha* contributes the "future"[2] dimension). We postpone the discussion on the denotation of verb type 6 as well as verb type 10 for the next section. Verb type 9 denotes an event that will be completed in the future before another event or a certain point of time.

4. A multi-level analysis of Modern Greek grammatical tense

   It has already been said that the existing literature does not capture the entirety of the Modern Greek tense types. Furthermore, it does not provide a unified system of representation of grammatical tense. The relevant proposals (Mozer, 2010, Tsaggalidis, 2007) employ just two features, namely TENSE with values +/- past and TELICITY with values +/- perfective. Therefore, they do not provide enough combinations for encoding the traditionally accepted 6 tenses, let alone the 10 tenses attested in the corpus data (Table 1 and Section 5). We, on the other hand, had to face the challenge of developing an LFG/XLE grammar that would model tense usage in both main and subordinate clauses. In this section we describe our system for tense representation that accommodates an enriched tense system as compared to the one accepted in traditional grammars of Modern Greek and the subjunctive (discussed in Section 7).
   Most Indo-European languages, including Greek, are considered to have a binary system of tense in the indicative (past versus non-past) where non-past includes the present and future tenses (Mozer, 2009:57). According to Jaewon Yu (1983:14-19), this binary contrast is not what is usually called "Grammatical tense". He called it "Linguistic Time" and argues that it expresses the location of events on the axis of time in relation to the speaker time. Linguistic Time is the basic property of Grammatical tense that is a more complex concept. We adopt the term "Linguistic Time" to encode the

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[2] In the next section (section 4) we argue that the term "future" should be replaced by the term "anticipation" as regards the denotation of the verb types of Modern Greek that are formed with the particle *tha*.

binary contrast +/-PAST that should be encoded because it is the only visible morphological distinction of time in Modern Greek: it is actually the case that verb forms use either the +PAST morphological type or the –PAST one (Tsangalidis, 1998 & 1995).

In addition to "Linguistic Time", "aspect designates the perspective taken regarding the internal temporal organization of the situation by denoting different ways of viewing the internal temporal constituency of the same situation". (Comrie 1976:3) In Modern Greek, as Xydopoulos & Tsangalidis (2007) note, the speaker uses aspectual distinctions to express her viewpoint. Thus, if she describes a situation viewed as a simple whole, that is as a unit without internal structure, the aspect is perfective (18), otherwise the aspect is imperfective (19) (Mozer, 2009:61-69).

(19) **Egrapsa**   thn ergasia mou. (perfective)
      write.Vt3.1SG   my essay.
      "I wrote my essay."

(20) **Egrapha**   thn ergasia   mia oloklhrh vdomada. (imperfective)
      write.Vt2.1SG   my essay   for an entire week.
   "I was writing my essay for an entire week."

For the purposes of our XLE grammar, we had to develop a unique description for each Modern Greek verb type. To this end, we adopted a multi-feature approach in the spirit of Reichenbach (1947). Reichenbach introduces three abstract time points: Speech time (S), Event time (E) and Reference time (R). In his system, tenses are expressed as sets of relations among these three points. Two types of relation are defined in Reichenbach's system: to "precede" and to "coincide". These assumptions enable the system to produce all possible tenses in terms of the three primitives (S, E, R) involved in the two relations ("precede" and "coincide").

In what follows, we first present our approach and then we compare it with Reichenbach's system. Table 2 gives the relation of the three time points that we assign to each verb type of Table 1. '=' denotes the 'coincide' relation and X $\rightarrow$ Y the 'X precedes Y' one.

	Verb types	Time point relations
1	H Maria *paizei* raketes kathe kalokairi. "Maria plays rackets every summer."	S = R = E
2	H Maria *epaize* raketes gia polla xronia. "Maria was playing rackets for many years."	R = E →S
3	H Maria *epaikse* raketes chtes. "Maria played rachets yesterday."	R= E →S
4	H Maria *tha paiksei* raketes aurio. "Maria will play rackets tomorrow."	S = R → E
5	H Maria *tha paizei* raketes kathe apogeuma. "Maria will be playing rackets every noon."	S = R → E
6	H Maria *tha epaize* raketes mechri to vradu. "Maria would play rackets till night."	E → R =S
7	H Maria *echei paiksei* raketes schedon se oles tis paralies. "Maria had played rackets on almost every beach."	E → R→S
8	H Maria *eiche paiksei* raketes se epagelmatiko epipedo. "Maria had played rackets professionally."	E → R → S
9	H Maria *tha echei paiksei* raketes mechri *na* kaneis mbanio. "Maria will have played rackets by the time you have a swim."	S → E → R
10	Prin na fugoun xthes to apogevma, h Maria tha *eiche paiksei* raketes. "Before they were gone yesterday afternoon, Maria would have played rackets."	E → R → S

Table 2. The relation of the three time points

The binary distinction +/-PAST (Mozer, 2009:57) (Schema 1) that we have adopted, is understood to indicate the relation of speech and event time. We define the feature Linguistic Time (LING_TIME) to encode the relation between S (Speech time) and E (Event time). +PAST is modeled with E →S and –PAST with the other two options (S = E, S → E).
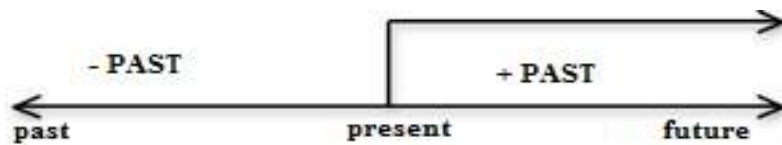
Schema 1. Time axis

While +PAST is assigned a single representation, namely R→ S, –PAST is related with two representations, namely S = R and S → R. Of them, the first corresponds to the present tense while the second to tenses denoting the "future". These tenses are always and exclusively formed with the particle *tha* (Table 1). We note here that Yu argues that the particle *tha* of Modern Greek denotes both the future and uncertainty (Yu, 1983). Drawing on this idea, we introduce the feature ANTICIPATION (ANTIC) to encode the notion of "an event that is anticipated to take place". Only the particle *tha* is specified for the feature ANTIC in the lexicon. The intuition is that *tha* sets a time point indicating when the anticipation for a certain event occurred.

tha   PART * (↑ PART_FORM) = tha
          (↑ ANTIC)

The ANTICIPATION (ANTIC) value of a verb form is specified in the syntax with a rule as verb forms with *tha* are always analytic. With verb types 4, 5 and 9 this time point is understood to coincide with the speaker time while with verb types 6 and 10 it is understood to be situated in the past because the anticipated event itself is situated in the past as well.

We now come to the issue of aspect. The importance of aspect in the organization of the Greek verbal system has been long established (Mozer, 2008). Terminology about aspect is rather complicated. Here we adopt the terminology and the proposal of Tsaggalidis (2007), namely that grammatical aspect in Modern Greek expresses TELICITY. TELICITY is the property of a verb or verb phrase that presents an event as being complete, a "unit' in some sense: a verb or verb phrase with this property is said to be perfective. On the other hand, a verb or verb phrase that looks into the temporal constitution of an event (whether it is ongoing, incomplete) is said to be imperfective (Mozer, 2009:61-69). Thus, we define the feature TELICITY (TEL) with values "perfective" and "imperfective". The verb types 2 and 3 differ from each other exactly in the values of TEL (the feature T_FR will be introduced immediately below):

Verb type 2
epaiza   V *   (↑ LING_TIME)= +
             (↑ T_FR)= IDEN
             (↑ TELICITY)= IP.
Verb type 3
epaiksa   V *   (↑ LING_TIME)= +
               (↑ T_FR)= IDEN
               (↑ TELICITY)= PE.

   The verb types 4 and 9 (as well as 3 and 8) pose an interesting problem. Verb type 4 says that a certain event is anticipated to take place at a given time point ahead of the speaker time (what we normally call 'the future'). Verb type 9 says that a certain event will have taken place at some time point before another time point and both points are situated 'in the future'. Both verb types are specified as LING_TIME=-, TEL=+, ANTIC=+. We need one more feature that will encode the difference between these two verb types, a difference that boils down to whether R and E coincide or not. Drawing on work by Poulson (2011), we define the feature Time Frame (T_FR) that encodes the relation between R and E with values Non Identical (NIDEN), if E is not identical to R (E → R, R → E) and Identical (IDEN) if E and R coincide.

Verb type 4:
tha paiksw   V *   (↑ LING_TIME)= -
                   (↑ T_FR) = IDEN.
Verb type 9:
tha echv paiksei   V *   (↑ LING_TIME)= +
                       (↑ T_FR) = NIDEN.

   In summary, the proposed modeling of the denotation of the verb types in Table 1 as regards Grammatical tense uses four features and a closed set of values as shown below:
1. LING_TIME {+ PAST,-PAST}
2. T_FR {NIDEN, IDEN}
3. TEL {IP, PE}
4. ANTIC{+}

   Table 3 shows the representation of the verb types in Table 1 in terms of the system of features and values discussed so far. Each verb type is assigned a unique combination of values of these features although two different verb types may share the same value for a certain feature. For instance, verb types 2 and 3 share the same Reichenbachian representation, namely R=E->S and the T_FR value but differ in terms of TELICITY values. The overall system is over-expressive in the sense that the total number of

Modern Greek verb types is smaller than the number of the possible combinations of the features. We have no principled explanation to offer about this fact but a possible line of research would be to explore the effect of time adverbials on verb type meaning.

	Greek Form	English Gloss	Tr. Anal.	TENSE	T_FR	Telicity	ANTIC	Reich. Anal.
1	paizw	play/be playing	-PAST	-PAST	IDEN	IP	-	S=R=E
2	epaiza	was playing	+PAST	+PAST	IDEN	IP	-	R=E→S
3	epaiksa	played	+PAST	+PAST	IDEN	PE	-	R=E→S
4	tha paizw	will be playing	-PAST	-PAST	IDEN	IP	+	S=R→E
5	tha paiksw	will play	-PAST	-PAST	IDEN	PE	+	S=R→E
6	tha epaiza	would play	Ø	+PAST	IDEN	IP	+	E→S=R
7	echw paiksei	have played	+PAST	+PAST	NIDEN	PE	-	E→R→S
8	eicha paiksei	had played	+PAST	+PAST	NIDEN	PE	-	E→R→S
9	tha echw paiksei	will have played	Ø	-PAST	NIDEN	PE	+	S→E→R
10	tha eicha paiksei	would have played	Ø	+PAST	NIDEN	PE	+	E→R→S

Table 3. Analysis of verbal tenses in Modern Greek

5. Two new tenses

We now turn to the two tenses that we have introduced in Table 1 but did not discuss in Section 3, namely verb type 6 and verb type 10. Traditional Modern Greek grammars do not treat these verb forms as tensed forms. However, our corpus data and our intuitions as native speakers show that both verb type 6 and verb type 10 are used in main declarative sentences (http://www.alexandrafiotaki.com/New-proposed-tenses). Also, Yu (1983), in his study of the sequence of tenses in MG, treated both verb type 6 and verb type 10 as widely accepted tenses.

From the point of view of tense modeling, the interesting feature of these tenses is that they express anticipation and past at the same time. Verb type 6 denotes an event that was anticipated to happen in the past. In Section 4 we mentioned that the particle *tha* contributes a time point at which the anticipation about an event occurs.

(21) says that the described event would occur at some time point in the past that is preceded by another time point at which the anticipation about the "playing event" occurred. Thus, the interpretation of (21) is: "At some time point t1 the anticipation occurred that at some later time point t2 the athlete would play with an injection. The speaker delivers this information at

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the time point t3 and it is the case that t1 precedes t2 precedes/coincides with t3."[3]

(21) O athlhths   **tha epaize**   me enesh. (Vt6)
     The athlete   play.Vt6.3SG   with an injection.
     'The athlete would play with an injection.'

We turn now to verb type 10. It denotes an event that was anticipated to take place in the past before a specific temporal point before the speaker time. The particle *tha* contributes the same information described for verb type 6 above. For example, (22) says that a signing event was anticipated to take place and, contrary to verb type 6, it would be concluded in the past. Point C in Schema 2 represents the time when the anticipation occurred about the signing event that would take place after the time point C and before the speaker time.

(22) Oi politikoi   **tha eichan upograpsei** prin thn cthesih diaskepsh. (Vt10)
    The politicians sign.v10.3PL   before the yesterday conference.
     'The politicians would have signed before the yesterday conference.
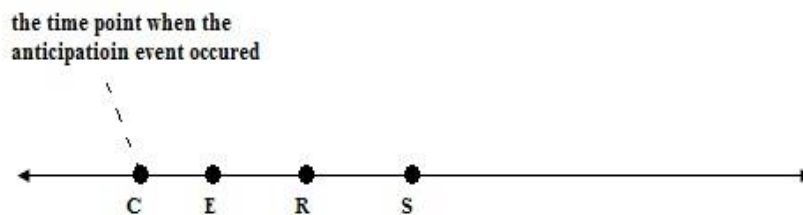
Schema 2. *tha* introduces a time point after which an event is anticipated to take place

Apart from their tensed usage in language, as exemplified in (21) and (22), both verb types 6 and 10 occur in apodoses of conditionals, however, conditionals are out of the scope of this discussion.

6. Reichenbach's theory (1947) vs our analysis
We briefly presented Reichenbach's approach in Section 4. Reichenbach (1947) uses the concepts of speech, event and reference time point and the relations between them and details the structure of nine tenses (Table 4), namely past, present and future that may take a simple, anterior or posterior form.

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[3] More research is needed in order to argue in favor of t2 < t3 or t2=t3.

	Temporal relations	Tense category	Traditional label	Example
1.	E–R–S	Anterior Past	Past Perfect	I had passed the exam by the end of the winter.
2.	E,R–S	Simple Past	Simple Past	I passed the exam.
3.a	R–E–S	Posterior Past	--	I did not know that he would win. (yesterday)
3.b	R–S,E	Posterior Past	--	I did not know that he would be here. (right now)
3.c	R–S–E	Posterior Past	--	I did not know that he would come. (tomorrow)
4.	E–S,R	Anterior Present	Present Perfect	I have passed the exam.
5.	S,R,E	Simple Present	Present	I see John.
6.	S,R–E	Posterior Present	Simple Future	I shall see John.
7a	S–E–R	Anterior Future	Future Perfect	I will have passed the exam by the end of the winter.
7.b	S,E–R	Anterior Future	Future Perfect	John will have fixed the car by tonight.(already repaired)
7.c	E–S–R	Anterior Future	Future Perfect	I will have fixed the car by tonight. (just repairing it)
8.	S–R,E	Simple Future	Simple future	I will see John tomorrow.
9.	S–R–E	Posterior Future		I shall be going to see him.

Table 4. Reichenbachs's tenses (Reichenbach, 1947)

In Table 4 certain English tenses are assigned more than one representation, for instance the Future Perfect is assigned three representations (Comrie, 1985) implying that the framework results in serious ambiguity. Furthermore, Reichenbach's system contains tenses that are not morphologically realized in English or in Modern Greek (or in any language (Comrie 1981, 1985)). The overcapacity of the Reichnbachian system has been strictly critized by Declerck (1986:307). However, the main issue is not the overcapacity of the system since (some of) the combinations that are not used in English may be useful in other languages; rather it is the fact that Reichenbach had tried to prove that each combination of the three points captures a different tense.

Comrie (1985) who distinguishes two types of tense, namely absolute tenses (present, past and future) and relative tenses (complex tenses), suggests that R (Reference time) is necessary only for the representation of complex tenses. As regards Modern Greek, we have argued that R is necessary for the representation of the meaning of verb types 9 and 10 (and possibly 6) that are complex tenses. In all other cases, R is identical to S or to E.

7. Accommodating the Subjunctive in the proposed tense system
It is generally accepted that all verb forms of Modern Greek that are preceded by the particle *na* are manifestations of the subjunctive mood. However, our work with corpus data has yielded the following types of *na* clauses:
1. Main clauses expressing a variety of modalities
2. Main clauses introduced with *na* and expressing the imperative
3. Subordinate clauses introduced with *na*
Here we will be concerned with clauses of type (3) only. Such clauses are universally considered as typical "subjunctives" (see examples (23) ,(24)).

The syntactic nature of *na* is a controversial topic in MG linguistics. Warburton &Veloudis (1984) have analyzed *na* as a subjunctive marker and argued that *na* is not a complementizer when it introduces subordinated clauses. Similarly, Tsimpli (1990) analyzed *na* as a modality marker that selects agreement and untensed phrases. On the other hand, Agouraki (1991) claims that *na* is a complementizer and, despite the fact that the verb of a *na* subordinated clause is tensed, its meaning depends on the time reference of the main verb. Fiotaki (2014) treats *na* as a complementizer that introduces main and subordinated clauses expressing different modalities.

The observation that verb heads of *na* subordinated clauses[4] are untensed (Tsimpli (1990), Agouraki (1991)) is important. The phenomenon has also been noticed with English subjunctives: von Stechow (1995) claimed that "The semantic effect of the subjunctive will be that it selects Ø-tense". However, depending on the semantics of the main verb, some amount of tense information is available with subordinated *na* clauses (23), (24). So while Linguistic Time is the same in both clauses, namely –PAST as regards both (23) and (24), the subordinated clause may have its own T_FR value as is clearly the case with (24).

(23) H Maria **schediazei** *na* **teleiwsei** th douleia ths avrio.
      The Maria plan.Vb1.3SG to finish.3SG   her work   tomorrow.
      "Maria plans to finish her work tomorrow."

(24) H Maria **schediazei**   *na* **echei teleiwsei** prin to meshmeri.
      The Maria plan.Vb1.3SG to   finish.Vb7.3SG   before noon.
      "Maria plans to have finished her work before noon."

In spoken Modern Greek, there exist no distinct morphological types for the moods indicative and subjunctive although, of course, the moods exist (Mozer, 2009). The morphological distinction between the corresponding verb forms in written Modern Greek was abandoned after 1976 when an attempt for orthographic simplification was made. Since in Modern Greek there is no evidence that the indicative and the subjunctive have distinct morphological manifestations, the same verb form has to be used for both these moods. However, a disjunctive value of the feature MOOD "indicative/subjunctive" is not possible because indicative mood is tensed and subjunctive mood is untensed (at least, in *na* subordinated clauses). Furthermore, if, despite the lexical proliferation it implies, the traditional approach is adopted that assigns a binary value (+/-PAST) to the feature

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[4] Controlled na subordinated clauses are generally accepted to be untensed, however, more research is needed as regards the tensed/untensed nature of uncontrolled ones.

LING_TIME, the feature LING_TIME has to be eliminated in order to encode the notion 'untensed' and that would leave out facts like (24).

Facts about the *na* subordinated clauses can be modeled in our tense system naturally with the use of notions and mechanisms of LFG, namely control and restriction. We thus propose that the LING_TIME feature is restricted when it combines with *na* and then, the subcategorizing verbs impose their own LING_TIME on the subordinated verb with control. The remaining tense features of the subordinated verb are active as can been seen in (24).[5] Thus "subjunctive" is not a lexical property of verbs but it is formed in the syntax. No special verb entries are needed for the subjunctive since the same verb type is used for both the indicative and the subjunctive moods. The treatment of the subjunctive mood we have proposed is provided for free by the tense analysis and the representation system we introduced in Section 4. Table 5 contrasts the representation of subjunctive mood according to our model with the representation of subjunctive mood according to the traditional model and explains why facts like (24) can be captured with our proposal but not with the traditional approach.

The feature ANTIC(IPATION) of a subjunctive verb is set to '-' because of the complementary distributions of the complementizer *na* and the particle *tha*. Again this comes for free from the tense analysis and representation system presented in Section 5. Lastly, the feature TEL is a morphological characteristic defined by the verb type.

VERB TYPES	OUR MODEL	TRADITIONAL MODEL
na echw paiksei	NIDEN/PE	PE
na eicha paiksei	NIDEN/PE	PE
na epaiksa:	IDEN/PE	PE
na epaiza	IDEN/IP	IP
na paiksw:	IDEN/PE	PE
na paizw:	IDEN/IP	IP

Table 5. Annotation of "subjunctive" verb types

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5 The issue of *na* subordination is more complex than described here. However, the main mechanism, namely restriction of the LING_TIME feature and then control, applies to all types of *na* subordination.

7. LFG/XLE treatment

We have integrated the analysis of tense and subjunctive presented here into the fragment of the LFG/XLE Modern Greek grammar that we have developed.

In our implementation, auxiliaries are not specified for a PRED value (Frank et al., 1998) but they contribute the agreement, LING_TIME and T_FR features. TELICITY is always specified by the main verb. Verbs supporting main clauses are specified for all the four tense features. The main verb form Vinf (*paiksw,* Table 3: 5) does not support a clause on its own, it is declinable for person and number and combines with *tha* to support a main clause. On the other hand, *paiksei* (3-sg of *paiksw)* is indeclinable when it combines with the auxiliary *echw* to yield the verb forms 7 & 9 and with the auxiliary *eicha* to yield the verb forms 8 & 10. Rule 1 uses restriction to yield these analytic verb forms.

Rule 1
 Vtns -->
{#For parsing the verb types 4 and 6
PART: (^ PART_FORM) = tha; V: ^=!

#For parsing verb type 5
 |PART: (^ PART_FORM) = tha; Vinf: ^=! @(LING_TIME -)

#For parsing verb type 7
 |{AUX:(^ AUX_FORM)= eiche ; Vinf: ^=! /PERS/NUM

 #For parsing verb type 8
 |AUX:(^ AUX_FORM)= echei; Vinf: ^=! /PERS/NUM}

#For parsing verb type 9 and 10
 |PART: (^ PART_FORM) = tha;
 AUX:(^ AUX_FORM)= echei (^ NUM_PERS)=c 3SG   ; Vinf: ^=!
/PERS/NUM

#For parsing verb type 10
 |PART: (^ PART_FORM) = tha;
 AUX:(^ AUX_FORM)= eiche (^ NUM_PERS)=c 3SG ;   Vinf: ^=!
/PERS/NUM}.

We have already explained that the verb heads of *na* subordinated clauses are not specified for LING_TIME; rather their LING_TIME value is controlled by the main verb. On the other hand, the verb heads of *na* subordinated clauses may be specified for T_FR and TEL(ICITY). No

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minimally different lexical entries are needed in the grammar lexicon, as the LING_TIME feature is restricted when the *na* complement is formed. Restriction of LING_TIME is performed in the syntax with Rule 2. In this way, loss of temporal information is avoided and there is no need of new lexical entries

Rule 2.
VPcomp →
#Introduction of the complementizer *na*
COMPL:^ =! (! COMPL_FORM) =c na ;
#Introduction of the verb with no LING_TIME feature
VP : ^=!\ LING_TIME.

The f-structure below was developed by XLE for the string "O Nikos stamathse na paizei mpala" - "Nikos stopped playing ball". The underlined parts of the schema show that the value of the feature "LING_TIME" of the subordinated verb is controlled by the value of the verb of the main clause.

"O Nikos stamathse na paizei mpala ."   "Nikos stopped playing ball."
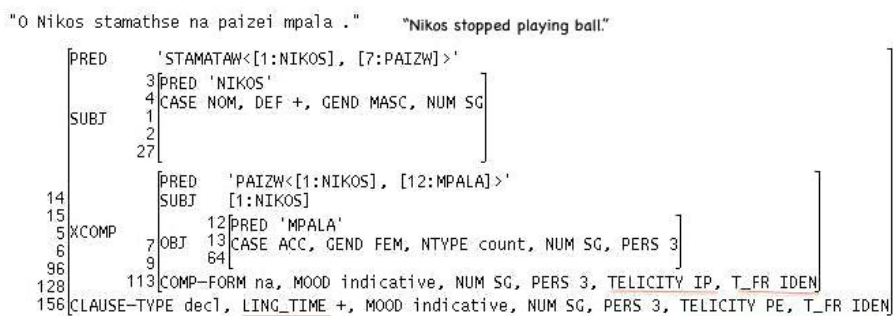
2 Conclusion

In a nutshell, the main advantage of our proposal is that grammatical tense is represented as a complex construction; therefore representations become more flexible and expressive. This flexibility makes our proposal the first unified representation of Modern Greek tenses that accommodates all types of main clauses; therefore it can be used for grammar development.

Of course, there is a difference between tense and temporal reference. The adverbs that can affect the meaning of tenses, also assign specific temporal reference that is not provided by the morphology of the verb type. In this sense, our proposal is about the "prototypical" meanings of the verb types in Table 1.

Depending on their lexical semantics, matrix verbs impose different requirements on the tense features of the *na* subordinated clause and probably on whether they are tensed or untensed. For instance, the 'aspectual' verbs *archizw* 'start', *sunechizw* 'continue', *stamataw* 'cease' etc. require that *na* subordinated clauses are headed by verbs with the following specifications: TEL (-imperfective), LING_TIME (–PAST) and T_FR (–IDEN). Our future work will focus on the study and grammar modeling of these requirements. In this way a detailed picture of the usage of the "subjunctive" in Modern Greek will be obtained.

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