The modality of the present and the future:  
Dutch, Greek, and beyond

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1 Introduction: main ideas to be discussed

The paper *Binary tense and modality* by Hans Broekhuis and Henk Verkuyl conveys a number of very refreshing proposals about how to analyze traditional categories such as the ‘present’, the ‘past’, and the ‘future’. At the most general level, the main goal of the paper is to offer arguments for replacing the well-known Reichenbachian system— which uses a three way distinction between speech time, event time and reference time— with a set of three binary oppositions attributed to the Dutch grammarian Lammert Allard Te Winkel. Te Winkel published a series of works on tense between 1848 and 1866; his ideas are most clearly articulated in the work of 1866 cited by Broekhuis and Verkuyl, and were further developed in Verkuyl (2008). These two studies form the foundation of the teWinkel-Verkuyl system presented in the paper.

Before moving to comment on the specific aspects of the proposal pertaining to the future and present, it is important to offer some terminological clarifications. In the literature, the term *tense* is used to indicate tense morphology which typically, though maybe not exclusively, is used for temporal orientation. Tense, in this sense, is a morphological category, i.e. the grammatical category realized in the system of a language. On the other hand, the term *tense system* is taken to mean the mechanisms of temporal interpretation assumed to be common, perhaps even universal, to natural languages— for instance, a Reichenbachian tense diagram (Reichenbach 1947) or a Priorian system (Prior 1967). These two definitions correspond to the grammatical tense distinction as opposed to the notional partitions of time represented in a natural language (Jespersen 1924:255).

The Te Winkel-Verkuyl system is proposed as a general tense system intended to replace Reichenbach’s ternary division. It uses three binary oppositions, and show how these can be implemented to cover the Dutch tenses. The oppositions are: Present/Past, Synchronous/Posterior and Imperfect/Perfect. These are characterized as tense oppositions, though at least the third one clearly isn’t: imperfect vs. perfect reflects the imprefective (atelic, unbounded, ongoing) vs. perfective (telic, bounded, completed) distinction, so it is most clearly aspectual. It is not important whether the key oppositions are purely temporal or not; what I take to be valuable lessons of this system are the following. Te Winkel took the second opposition (Synchronous/Posterior) to be reflected in the absence or presence of a temporal auxiliary *zullen* ‘will’. However, Broekhuis and Verkuyl argue that in a binary system, ‘future’ looses the status it has in a ternary analysis as being at the same level as Past and Present. They suggest that Present and Past *already may express prospective information* (they call it posterior, but I call it prospective, following Giannakidou and Zwarts 1999); and this leaves no temporal role for the ‘future’ auxiliary *zullen* ‘will’. Therefore the internal dynamics of Te Winkel-Verkuyl system, *forces the future auxiliary to a purely modal meaning*. In the authors’ own words:
The question of whether the category ‘future tense’ in natural languages is a tense or modality has received a lot of attention in linguistic semantics, and both answers have been explored (for modal accounts see Bertinetto, 1979; Enc 1996, Copley, 2002; Squartini, 2004; Kaufmann 2005, Mari, 2009, Klecha 2011, Giannakidou 2012, Giannakidou and Mari 2012, 2013; for a defense of the temporal analysis see Kissine 2008). Certainly, the English future word ‘will’ is a modal, and admits purely epistemic readings. We read, e.g. in Palmer, that “it is tempting to refer to the meaning of will as probability, alongside possibility and necessity for may and must. … A better paraphrase is in terms of conclusion: ‘A reasonable conclusion is that.., (Palmer 1987: 136)’.”

The sentences above with will are conjectural: will seems to convey a sort of epistemic modality: given what I know, it is quite likely or it is quite plausible, or in cases of stronger certainty, it must be the case that that the French are on holiday this week. According to Broekhuis and Verkuyl, zullen is likewise an epistemic modal operator used to express that the prejacent proposition is the result of reasoning given reasonable premises. To quote from the conclusions:

“We think that the best way to describe the meaning of WILL(p) is to say that the speakers using this modal verb feel sufficiently confident to say p is true at n or is to be made true at i. This confidence relies on information judged as reliable and well-founded. It may take all sorts of form dependent on the situation: as a hypothesis, a confident expectation, a reassurance, etc. What these circumscriptions have in common is that the speaker has entrance to sufficiently many worlds to be able to pick out the ones that seem convincing.” (Broekhuis and Verkuyl 2013: Conclusions).

This is a very appealing analysis of the future morpheme, and indeed in line with a recent proposal I made about Greek (Giannakidou 2012), and in joint work with Alda Mari about Greek and Italian futures (Giannakidou and Mari 2012, 2013). The idea that the future is modal is also common in the Italian literature (Bertinetto 1979, Mari 2012 and more works cited therein). These studies join forces with Broekhuis and Verkuyl: if indeed Dutch, Greek, Italian and English future morphemes convey modality, then the ‘future’ as a temporal category becomes redundant, at least in these languages. This is, in my view, one of the most important and welcome implications of this paper, and I would like to discuss it further in this response.

Another very appealing feature of the analysis is the treatment of the present. The Reichenbachian’s identification of the present with the ‘speech time’ is rejected, and it is instead that the present tense denotes an ‘extended present’. The temporal category ‘present’, Broekhuis
and Verkuyl argue, is an open interval that contains the actual speech time (‘now), but also times close to now, before or after it. This extended present then, contain both retrospective (past) and prospective (future) portions of time. If the present contains times after now, then present tenses can be used to refer to future events. As I noted at the beginning, this assumption is crucial in the system because it renders the category ‘future’ systemically redundant—since futurity is now also expressed by the present. But conceptually too, I find the idea that the present is a continuum that includes the speech time but moves forward quite liberating.

The idea that the present contains some portion of the future, and that this depends on the combination present, synchronous and imperfective (as it does in the teWinkel-Verkuyl system) successfully captures the fact that present forms that have these properties are often used as futures in languages, e.g. Slavic, Germanic languages, Greek and to a certain extend Italian. It is also consistent with the intuition that the imperfective aspect conveys modality, often voiced in the relevant literature (see Trnavac 2006 for a recent overview and generalizations). At the same time, the impossibility of combining a perfective form with a present—something we see very clearly in Greek—also confirms the connection between imperfectivity, present and future, while also necessitating a distinction between a ‘present’ and a nonpast, as I suggested in Giannakidou 2009. I will compare Dutch, Greek and English more closely in section 2, and I think it will become evident that we need to acknowledge that not all present forms shift to future. We therefore have to address the question of whether a given present tense form does, or does not, denote the extended interval. From that discussion, we conclude also that, although indeed the semantic present is an interval, it is desirable to further constrain it as a forward-looking interval only, i.e. as containing times only after now. The main motivation for this is that present forms do not ever make reference to the retrospective present interval only; and in the teWinkel-Verkuyl system, that retrospective present interval overlaps with the past anyway.

I will proceed as follows. I will comment first on the idea of extended present in section 2, and then go on with the modal analysis of future morphemes in section 3. Following Giannakidou 2002, and Giannakidou and Mari 2012, 2013, I will suggest that the future, as a modality of predictions, contains both epistemic and metaphysical dimensions. As purely epistemic modality, I will argue that the future produces epistemic weakening (Giannakidou 2002, to appear), which we observe in Greek, Italian, English, and as it turns out, Dutch.

2. The extended present: present, aspect, and futurity

Te Winkel’s overall system of Dutch tenses in presented in table 1. Verkuyl’s rendering of the system is reflected in Fig. 1, where the past vs. present opposition is the highest one:

![Fig. 1 The scope relations between the tense operators](image-url)
The order here is also consistent with the idea that the two lower distinctions are more ‘aspectual’. In languages with grammatical aspect such as perfective and imperfective, the aspectual morphemes will appear lower than the tense, closer to the verb stem.

One important empirical point that the authors make is that the present form does not always make reference to now, to the speech time. This is a well-known fact about present forms crosslinguistically, and here are the examples from Dutch:

(3) a. Elsa werkt deze week aan de paragraaf over het tempussysteem.
   Elsa works this week on the section about the tense system
   ‘This week, Elsa is working on the section on the tense system.’

b. Gisteren heeft ze de algemene opbouw vastgesteld.
   yesterday has she the overall organization prt.-determined
   ‘Yesterday, she has determined the overall organization.’

c. Vandaag schrijft ze de inleiding.
   today writes she the introduction
   ‘Today, she is writing the introduction.’

d. Daarna zal ze de acht tempusvormen beschrijven en vrijdag is ze klaar.
   after that will she the eight tense forms describe and Friday is she ready
   ‘After that, she will describe the eight tense forms and Friday she will be ready.’

In these examples, the underlined ‘present’ forms do not place the eventuality of the sentence at the speech time. In 3a, c we have reference to the present but the present is extended, it covers the interval given by deze week “this week” and vandaag “today”. In 3b, the present on the auxiliary also fails to make reference to the speech time. In the d example, the present further makes reference to a future time. Clearly, then, we cannot just say that the present form makes the eventuality true at the speech time, as one would expect from the Reichenbachian analysis.

Greek presents are used parallel to the Dutch:

(4) a Afti tin evdomada, i Ariadne doulevi to proto kefaleo.
   This week, Ariadne is working on the first chapter.

b Simera, i Ariadne doulevi tin eisagogi.
   Today, Ariadne is working on the introduction.

c Avrio, i Ariadne ine etimi.
   Tomorrow Ariadne will be ready.

These presents are not uncommon, so empirically, the claim based on Dutch can be extend to Greek. In Geek, the present in lieu of the future particle tha indicates often imminence of the event, i.e. that it will happen close to the speech time.1

1 Yet, this is a tendency only, as one can certainly say e.g. in November:

(i) Afto to kalokeri metakomizoume. ‘This summer we are moving.’

In such a case, and it is my impression with all Greek presents as futures, there is a strong flavor of scheduling, a plan already in place (as has been observed in Copley 2002 for the English progressive). In Dutch, on the other hand, present-as-future doesn’t necessarily convey scheduling/plan (though, of course, it may also do so). It is my impression that the scheduling reading is expected in the analysis of the extended present, as an intentionality that covers the prospective interval of the present. (More on the analysis next).
Notice that the English present, contrary to Dutch and Greek, is resistant the future use: in the actual present examples in 3a and c, a progressive form is used, and in the future example we need will. The English simple present is odd or at best marked, designated below by "#".

(5)  

<p>| | |</p>
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>a</td>
<td>#This week, Elsa works on the section on the tense system.</td>
</tr>
<tr>
<td>b</td>
<td>#Today, Elsa works on the introduction.</td>
</tr>
<tr>
<td>c</td>
<td>#Tomorrow, Elsa is ready.</td>
</tr>
</tbody>
</table>

Kaufmann argues that the simple present in English can have future usage, but Copley 2002 and others consider such uses highly marked or impossible. The speakers I have consulted share Copley’s intuitions. So, empirically, one must conclude that the English and Dutch/Greek presents differ in their ability to receive future reading. We come back to this variation.

2.1 The main analysis

The authors argue that “the basic problem of Reichenbach’s approach to tense based on the ternary opposition Past/Present/Future is the identification of the notion of speech time with the notion of present. Keeping these notions strictly apart turns out to offer important advantages. For example, it allows us to treat tense as part of a developing discourse: shifting the speech time does not necessarily lead to shifting the present.” (Broekhuis and Verkuyl 2013: XX).

In the binary system offered by Broekhuis and Verkuyl, the expression of ‘present’ (the PRES-operator) is interpreted as pertaining to some temporal domain $i$ containing $n$. The intuition is that, by the use of a present tense, speakers present eventualities as occurring in the eventuality’s present even though these eventualities need not occur at $n$ itself. A speaker could utter a sentence like (3a) on Tuesday to express that Elsa is dedicating the whole week to writing the mentioned section on the tense system. Likewise, in the d example, the present extends to times after the utterance time.

The extended present is graphically given in Broekhuis and Verkuyl’s Fig. 2:

![Fig. 2 The present tense domain i](image)

N is the designated speech time, which establishes a partition of the present interval into $i_a$, (I suppose for interval anterior), the ‘past’ of present, i.e. time prior to $n$ and close to it, and $i_i$, which is time immediately following $n$. It is then also stated that the present tense domain is contextually determined, or given by adverbials such as deze week, vandaag etc. The Dutch Simple Present form is claimed to express that the present domain $j$ of the eventuality $k$ is taken to be synchronous to the present domain $i$ of the speaker/hearer ($j \approx i$). This formulation predicts that by the use of a present tense form, the eventuality $k$ may be located in $i_a$ or in $i_i$. This is illustrated in fig. 3.
The extended now interval is the semantic contribution of the ‘present’. This analysis covers nicely both Dutch and Greek presents, as we just saw. The common generic use of presents seems to support this analysis too. I give below examples from Dutch, English, French and Greek:

(4) Ta fila peftoun apo ta dentra to fthinoporo.  
Greek  
Les feuilles tombent des arbres à l'automne.  
French  
De bladeren vallen van de bomen in de herfst.  
Dutch  
The leaves fall from the trees in the fall.  
English

These are generic uses of the present that refer to past, present, and future fallings of leaves. Here we seem to have the extended present interval replacing all relevant time—which captures the often voiced intuition that generic sentences are ‘atemporal’. So, the systematic generic use of present tenses falls nicely under the interval present analysis, and gives further evidence for the need to extricate present from the tyranny of the speech time.

At the same time, however, it must also be appreciated that, putting the generic sentences aside, present expressions tend to gravitate toward the prospective interval future ($i \diamond$). One would expect, given the symmetry between $i_a$ and $i_n$, equal ability of present forms to refer to events that preceded the speech time. However, if we know that Ariadne indeed wrote the introduction today, maybe just finished it a second before the time of speech, we still cannot use the present tense in Greek or in Dutch.

(5) a) Ariadne grafi tin isagogi simera.  
The Ariadne writes.3sg the introduction today  
b) Ariadne schrijft de inleding vandaag.  
# Ariadne (just) wrote the introduction today.

It appears that the use of morphological present cannot refer only to the interval $i_a$, though clearly it can refer only $i_n$, which is what happens with the future reading of the present. To the extent that reference to $i$ is made, it is made jointly with an $i$ adverbial such as ‘today’. So, there is an asymmetry between the past interval of the present and prospective $i$ interval which seems privileged. The analysis, as it stands, doesn’t capture this asymmetry. But if we look at the treatment of the past (Fig. 5 and formula 33), we see that Broekhuis and Verkuyl propose wisely not a past tense that precedes $i$, but a past tense that simply precedes the utterance time $n$. Consider their formula 33:

(33) $[\text{PAST}(\varphi)]_{M,i} = 1$ iff $\exists i' \exists n'[[\varphi]]_{M,i'} = 1$ & $i' \circ n' \& n' < n \& i \circ n$. 

\[\text{Fig. 3 Simple Present : current } \text{current} \text{ posterior } \text{posterior}\]
By this definition, the past tense can refer to a time immediately preceding \( n' \) which is the *now* of the past, and which can itself immediately precede \( n \), which is located in \( i \). The condition does *not* say that the past interval \( i' \) needs to precede the present interval \( i \)— though of course it also allows this case, as the past can refer to any other time in past further away from \( n \). This definition renders any time prior to \( n' \), which can be immediately preceding \( n \), a past time, therefore the space \( i_a \) becomes truly unnecessary for the present \( s \)— as it is an actual past. In other words, the very definition of the past in the system, renders the past interval of the present unnecessary for present forms. If this is so, then the extended present analysis can be simplified to include the prospective interval only. In this sense, Broekhuis and Verkuyl’s extend present becomes a forward looking interval like the one proposed for WOLL (Abusch 2004) and the Greek nonpast (Giannakidou 2009).

We come back to this point. But first, I will address how general the extended present analysis can be across present forms in languages.

### 2.2 Extended present, nonpast, and crosslinguistic variation

Recall the observation I made earlier about the English present tense: why can’t it be used like the Dutch or the Greek one, which can easily shift to future readings?

(6)

\[
\begin{align*}
a & \quad \text{This week, Elsa #works/is working on her French exam.} \\
b & \quad \text{Today, she #writes/writing the introduction.}
\end{align*}
\]

English allows prospective reading of present only with explicit use of progressive markers, and verbs of motion (e.g. *John flies to Paris tomorrow*). According to Kaufmann, sentences like (7) are fine, though many speakers object to them (see also Copley 2002). The ones with the future auxiliary and the progressive are perfect.

(7) # The dice comes up heads.

(8)

\[
\begin{align*}
a & \quad \text{The dice is coming up heads.} \\
b & \quad \text{The dice will come up head.}
\end{align*}
\]

Kaufmann offers an analysis of the present tense as future in English by positing a null modal to account for the future reading. This is different from the approach suggested here—where there is no modality of the present, just the extended present interval. In my opinion, the present interval approach is a better approach, as it avoids positing unnecessary structure. But the empirical question is: why do we observe this variation in the ability of the present tense form crosslinguistically to be used as future?  In modern Dutch and I think German, the present-as-future is completely productive and unmarked; in Greek, less so, and in English it is considerably much more limited. Why?

At the very least, this variation should make us admit that not all present forms denote extended present intervals in the sense defended by Broekhuis and Verkuyl. Given the existence of two morphological forms for future reference—a present and a future— we may speculate a Jespersen-style cycle for the future: a weakening of the original form, strengthening of another one, and reanalysis. The original expression of future gets weakened (the auxiliary *zullen*), the present form gets strengthened as the expression of future, and then the strengthened form gets
reanalysed as the present-as-future. This appears to have evolved into full cycle in Dutch, maybe it is half-way in Greek, but it hasn’t evolved in English. This comment is somewhat speculative, but looking at diachronic corpora one can get more solid information about the interaction between *zullen* and the present. If the Jespersen-style hypothesis is correct, then we have additional evidence that *zullen* in Dutch is no longer semantic future, and this explains why it is not necessary for the expression of the future in Dutch.

Now, consider that there is another form in Dutch, also present and imperfective, but does not allow prospective readings. This is the progressive *aan het* structure:

(9) a. # Marie is morgen een brief aan het schrijven.
   b. Maria is writing a letter tomorrow.

Notice the contrast with the progressive in English, which *does* get the future reading. Why doesn’t the *aan het* progressive shift to the future? If anything, it contains a present (*is*), so this is quite unexpected. Moreover, given that this is a progressive form, it is surprising that unlike the English progressive we do not have a prospective shift with *aan het*. What is going on here?

I think that in order to account for such variations, one has to accept additional systemic constraints on the tense system. For instance, it is conceivable that the *aan het* progressive—which is never obligatory in Dutch (unlike verbal aspect such as the English progressive, and perfective imperfective) — doesn’t shift because, when chosen, the speaker intends to ensure the simultaneous interpretation. Pragmatic reasoning (speaker’s intention) thus excludes the shifted reading, we may simply say that the *aan het* structure does not denote an extended present in the Broekhuis and Verkuyl sense. In English, the progressive is obligatory and unmarked; and due to its imperfective nature, it is a perfect match for the extended present interval. But why not the simple present, which also seems to qualify? It appears, then, that whether apparent present forms in languages will allow prospective shift or not will be affected by other grammar internal factors, among which possible competition with other forms.

Finally, on the other side of the spectrum, and in confirmation of the interval analysis of present, notice that *perfective* presents in languages that allow them, do not shift to the future, and are in fact ungrammatical. One such clear case is Greek. The Greek verb is obligatorily inflected for tense and aspect, in both past and what I call non-past (following Holton et al. 1997, Giannakidou 2009). I give all combinations below: perfective non-past (PNP), perfective past (PP), imperfective non-past (INP) and imperfective past (PP).

(10) a. graf-imperf -o (INP)  b. grap-perf.1sg.nonpast
   ‘I am writing (right now).’
   ‘I write (generally).’

(11) a. e-graf-imperf -a (IP)   b. e-grap-perf.1sg.past
   past-write.perf.1sg.past
   ‘I used to write.’
   ‘I was writing.’

The basic temporal opposition is between a morphological past, which is usually marked by the prefix *e-* to the verbal stem and specific inflection; and a nonpast which is signaled by the absence of the prefix *e-* (hence the label *nonpast*), and which has its own inflection. The form
perfective non-past is not possible on its own, as indicated. This by itself supports the idea that present forms want to associate with intervals, maybe as default. If a verbal form appears in the perfective, it won’t be able to be used to convey the present interval. Hence, what appears as ‘present’ in (10b) is correctly characterized as non-past in Greek.

The INP behaves like a progressive or generic form, and is the equivalent of Dutch present, as we noted already.

(12)  

a  I Ariadne dinei exetasis avrio.
Ariadne is taking an exam tomorrow.
b  I Ariadne petai sto Parisi se ena mina.
Ariadne is flying to Paris in one month.

The imperfective nonpast is the actual semantic present (present tense) in Greek, and we can adopt for it the extended present analysis of the Dutch present tense. The defective perfective nonpast, however, can’t function as a present, because of its aspectual limitation of perfectivity (Giannakidou 2009). So, Greek actually possesses a semantic present (morphologically: imperfective nonpast) and a semantic nonpast (Giannakidou 2009). Crucially, the non-past improves in combination with nonveridical particles (Giannakidou 1998, 2009) such as the subjunctive *na*, the future *tha*, the optative *as*, and the conditional *an ‘if’*:

(13)  

a  As fiji o Janis.
as leave.PNP.3sg the John
‘Let John go.’
b  Na fiji o Janis.
nal leave.PNP.3sg the John
‘Let John go.’
c  Tha fiji o Janis.
tha leave.PNP.3sg the John
‘John will leave.’

All these occurrences of PNP plus particle have prospective orientation, so future reference is not a privilege of *tha*. In Giannakidou 2009 I claimed that Greek perfective nonpast denotes a prospective interval—but unlike the prospective present interval whose left boundary is *n*, the left boundary of the nonpast is undefined. It contains dependent (Giannakidou 1998) variable *t*.

(14)  

[[perfective nonpast ]] = λP λt P(t, ∞)

A dependent variable cannot remain free, but must be valued by some higher value. This idea is in line with Abusch's (2004) analysis of WOLL as a substitution operator. According to Abusch, "in the substitution operator, t is a bound variable that corresponds to the tense argument of will [which is *n*, coming from an implied higher PRES; clarification mine]. For a top-level occurrence of will, the effect is to substitute (*n, ∞) for *n*" (Abusch, 2004:39).

The Greek perfective nonpast then is a WOLL, but unlike will—where PRES is triggered by default (Abusch 2004: (48))—the Greek perfective nonpast does not convey or trigger PRES; so it becomes necessary to have an overt exponent of *now* in the structure, otherwise the structure is illicit:
The interval \((t, \infty)\) is ill-formed, because \(t\) is unvalued. The particles, I argue in Giannakidou, save the structure by providing \(n\). If we add e.g. the future \(tha\), \(t\) can now be identified with \(n\):

\[
\text{(16)} \quad [tha] = n
\]

\[
\text{(17)} \quad [tha] (\text{TP (15)}) = \lambda t \exists e [\text{write} (j, e) \land e \subseteq (t, \infty)] (n) = \exists e [\text{write} (j, e) \land e \subseteq (n, \infty)]
\]

The event of John’s writing will now be located at the interval that starts at \(n\) and stretches through infinity. This explains the possibility of future for the PNP, while saying that \(tha\) is NOT a future tense. The analysis says that \(tha\) simply contributes \textit{now}, which at the highest level is the speech time. The subjunctive particle \(na\) and the optative \textit{as} give exactly the same prospective interpretation (but differ from \(tha\) in also conveying non-declarative illocutionary force of a wish, request or invitation).

What is important for our comparison with Dutch is that in Greek, if this analysis is correct, there is indeed a speech time present: it is the present given by the particles, which are uninflected, invariant forms. And if the English present (according to Abusch) also contributes just \(n\), then we can indeed explain why the English present cannot be used as a future. (We still need to explain why it can be used generically, though). If particles generally introduce a speech time present, the theory makes predictions about other languages with particle morphology of this kind, most notably Slavic and other Balkan languages.

Another way of looking at this is to say that the particles do not really convey \(n\), but given the analysis of WOLL as PRES plus \((t, \infty)\), the additional structure provided by the particles simply gives a locus for a default triggering of the speech time. I am sympathetic to this implementation too, but it is not necessary to decide here which route is the right one. Importantly, for the present purposes, the prospective shift still relies in the combination of \textit{now} with a interval (non-past), a fact that comes to reinforce Broekhuis and Verkuyl’s proposal, namely that future orientation is a product of an extended forward looking interval. It’s just that, with non-past (as opposed to a \textit{true} present), the left boundary needs to be negotiated as now, and this requires additional structure.

I think that overall this analysis gives us a reasonable account for why we need the particles in the first place—and as I suggested in Giannakidou 2009, it can be readily extended to dependent tenses as a class: e.g. the tense of infinitives (also requiring a particle: \textit{to}), subjunctive verbal forms, and other anaphoric verbal tenses. In line with what I said earlier about strengthening and reanalysis of the present as future, we might be witnessing here in these dependent cases weakening of a present, and ‘demotion’ to nonpast.

I move on now to the discussion of the future morphemes.
3 The modality of future morphemes: epistemic weakening and prediction

The starting point of discussions of future sentences is often Aristotle’s very famous sea battle example (Περί Ἐρυθείας, De Interpretatione 9).

(18) a There will be a sea-battle tomorrow
    b There will not be a sea-battle tomorrow

A major goal of Aristotle in Περί Ἐρυθείας is to discuss the thesis that, of every contradiction, one member must be true and the other false (the “law of the excluded middle”). Regarding the future sentences, Aristotle acknowledges that the truth or falsity of each sentence will, in time, be fully determined by how things will turn out: there will either be, or not be, a sea battle. Aristotle also acknowledges that, at present (i.e. at the speech time), it is not known, in the sense that a past sentence can be known, that there will be a sea battle tomorrow. So, the future sentences at the speech time are objectively nonveridical (as the prejacent p is not true yet; Giannakidou 1998, Giannakidou and Zwarts 1999)— but they are also subjectively nonveridical, as they are compatible with an epistemic state at present that includes, for a future time, both p (there will be a sea battle) and not p (there will not be a sea battle); see Giannakidou 1998, 1999, Giannakidou and Mari 2013. Aristotle himself rejects the position that the truth value of a future statement is governed by the Law of the Excluded Middle.

From this perspective, future statements are pretty much like statements with modal verbs:

(19) a For all I know, there must be a sea battle tomorrow.
    b (In order for this conflict to end), there must be a sea battle tomorrow.

Modal verbs, in both epistemic and deontic uses, come with the same kind of indeterminacy about the prejacent proposition p, and are therefore also nonveridical (Giannakidou 1998, 1999, to appear, more discussion to follow). Broekhuis and Verkuyl correctly point out the parallelism of the future auxiliary with other modal verbs, e.g. in their example 9, and in their more thorough discussion in section 4.1.:

(9) a. Elsa zal dan wandelen.  a’. Elsa moet dan wandelen.
    Elsa will then walk
    ‘Elsa will walk then.’
    b. Ik zal je bellen.
    I will you call
    ‘I will call you.’
    c. We zullen morgen thuis zijn.
    We will tomorrow at home be
    ‘We will be at home tomorrow.’
    a’. Elsa moet dan wandelen.
    Elsa must then walk
    ‘Elsa must walk then.’
    b’. Ik ga je bellen.
    I go you call
    ‘I am going to call you.’
    c’. We kunnen morgen thuis zijn.
    We may tomorrow at home be
    ‘We may be at home tomorrow.’

Future orientation is common to zullen and non-zullen modalities in the prime examples, as we see. And claim is correctly that, despite the future orientation, it doesn’t make sense to say that the modal verbs ‘moeten’ must, kunnen, and therefore also zullen are future tenses. Future orientation is going to be attributed to the present on the auxiliaries. The modal verb itself (i.e.
minus the present) is thus an indicator of pure modality. To that end, I believe that in their criticism of Kissine, Broekhuis and Verkuyl are entirely convincing.

If *zullen* is a modal, what kind of modal is it? Broekhuis and Verkuyl argue that *zullen*, and by extension *will*, convey epistemic modality. This is revealed in their passage below:

“We think that the best way to describe the meaning of WILL(*p*) is to say that the speakers using this modal verb feel sufficiently confident to say *p* is true at *n* or is to be made true at *i*. *This confidence relies on information judged as reliable and well-founded.* It may take all sorts of form dependent on the situation: as a hypothesis, a confident expectation, a reassurance, etc. What these circumscriptions have in common is *that the speaker has entrance to sufficiently many worlds to be able to pick out the ones that seem convincing.*” (Broekhuis and Verkuyl 2013: Conclusions, underline mine).

The temporal dimension of the future is taken care of by the present tense. The relation between time and modality is given in Fig. 7. The underlined *k* indicates worlds that make the eventuality of the prejacent *k* true:

![Diagram](image)

**Fig. 7** Present tense and epistemic modality

A possibility modal statement is claimed to be true in this case, but a necessity modal is false, since it would require *all* worlds to be *k* worlds. This is a general format for modals (when future oriented) that includes *zullen*, whose force seems to be thought of as universal (in agreement with Enc’s 1996 for *will*, and the more recent analysis of Greek and Italian futures I mention next). Broekhuis and Verkuyl further state that: “we deviate from Condoravdi (2002) in *that we do not speak about a direct contribution of modals to temporal interpretation*. We would say that the modal accessibility relation R appears to fit into the structure underlying temporal interpretation rather than that it contributes to it.” (p. 25).

In Giannakidou 2002, I argued myself for an epistemic modal analysis of the Greek particle *tha*, and, in line with Broekhuis and Verkuyl, for a more clear division between the temporal and modal contribution of modals and the future. In more recent work with Alda Mari, we have suggested epistemic-based analyses of both Greek and Italian futures. Our approach is very compatible with the claims of Broekhuis and Verkuyl. In this part of my commentary, I will bring some insights of the Giannakidou-Mari analysis into the discussion that will help further refine the epistemic modal analysis of future auxiliaries crosslinguistically.

**3.1 Non-predictive uses of future morphemes: epistemic weakening**
Palmer 1987, Sarkar 1998, Huddleston 1995, Enc 1996, and Tsangalidis 1998 are among the many to point out that *will* has purely epistemic, conjectural reading, without conveying prediction about the future. Recall Palmer’s examples from the beginning:

(20)  

a  The French’ll be on holiday this week.  
b  No doubt, you’ll remember John.

According to Palmer, *will* here expresses the conclusion of reasoning that the speaker does, an idea very close to Broekhuis and Verkuyl’s view.² What kind of reasoning? Obviously, reasoning that relies on what the speaker knows or has evidence for. In concluding with *will*, the prejacent is supported. However, and we come back to this, the speaker’s confidence is not as high as it would have been, had she chosen a non-modalized form, e.g. *The French are on holiday this week*. The non-modalized sentence is therefore stronger, and conveys full confidence.

In Greek, as we see below, the future particle in the non-predictive use can be followed by either a present or a past tense form (see Tsangalidis 1998, Giannakidou 2012). In the past use, we see that it is compatible with past adverbials:

(21)  

I Ariadne tha pezi tura. (non predictive)  
the Ariadne FUT play.imprefective non-past3sg now  
Ariadne must be playing now.

(22)  

a  I Ariadne tha kimithike prin 2 ores. (non predictive)  
the Ariadne FUT sleep.PP.3sg before two hours  
Ariadne must have slept two hours ago.  
b  I Ariadne tha milise xthes. (non predictive)  
the Ariadne FUT talk.PP.3sg yesterday  
Ariadne must have spoken yesterday.

None of these cases is ‘future’ in the sense of making reference to an event that follows the utterance time. Rather, as can be seen in the translations, we use *must*. These are modal, inferential sentences, and *tha* conveys in itself no future or predictive information whatsoever.

The same non-future (non-predictive) uses, with past and present, is observed in Italian:

² Other non-predictive uses of *will* circulated in the literature are generic or with ability readings:

(i)  

Ed will get upset over nothing  
(Huddleston 1995)

(ii)  

Ed will lay in bed all day reading trashy novels.  
(Haegeman 1993)

(iii)  

Oil will float on the water.

I wonder whether these are possible with Dutch *zullen*. Certainly Greek *tha* can be used in these cases:

(iv)  

O Janis tha nevriasi me to tipota. John will get upset over nothing.

(v)  

O Gianis tha kathete sto krevati oli mera ke tha diavazi vlakies.  
John will lay in bed and read trash all day.

In these cases too, *will* comes out as the product of reasoning based on knowledge that the speaker has (see Giannakidou 2012, Chiou 2012, and Tsangalidis for earlier discussion).
Giovanni sarà malato.  
Giovanni FUT-be sick  
John must be sick.

Giovanni sarà stato malato.  
Giovanni FUT-be been sick  
John must have been sick.

These sentences, again, convey assessments that John must be/have been sick, and are not statements about John getting sick some time in the prospective interval of the present. Clearly then, what traditional grammars call ‘future’ morphemes have systemic non-predictive, epistemic uses, some of which can include reference to past events. In Dutch, these appear to necessitate past on the auxiliary (zou), but in Greek and Italian they involve a lower past tense.

In Giannakidou 2002, I argued that the future morpheme in the epistemic non-predictive use functions as a weakener of the speaker’s epistemic commitment to the truth of the prejacent. Epistemic weakening is defined as follows (see also Giannakidou to appear):

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

(25)  Veridical and nonveridical epistemic space  
An individual’s a epistemic space (a set of worlds) M is:
(i) veridical with respect to a proposition p just in case all worlds in M are p-worlds.  
(ii) If there is at least one world in M that is a non-p world, M is nonveridical.

The spaces we are talking about represent speaker’s knowledge. The idea is that sentences are not true of false in isolation but always relevant to the knowledge of an epistemic agent a, also called the individual anchor (Giannakidou 1998, Farkas 1992). We can think of this as a perspectival view on truth, see also Harris and Potts 2010; for a recent discussion of the relevance of individual anchors to temporal interpretation see Merchant 2013. In an unembedded sentence, a is the speaker. A veridical modal space is homogenous, as we see— all worlds are p worlds, and there is no further ordering source or partition to allow doubt (not p worlds). This is typically the case with unembedded assertions such as Ariadne is sick. If you compare this sentence to the FUT version of it, we conclude that the speaker, though highly confident about the truth of p, in choosing tha, she is still not confident enough to chose the unembedded assertion, as witnessed by the test below (from Giannakidou and Mari 2013):

(26)  a  
I Ariadne ine arosti — #ala dhen ime ke endelos sigouri.  
Ariadne is sick — # but I am not entirely sure.

b  
I Ariadne tha ine arosti — ala dhen ime ke endelos sigouri  
Ariadne will/must be sick — but I am not entirely sure.

Tha, FUT, and modalization in general appears to create nonveridical modal spaces, which are not homogeneous: they contain p and non-p worlds. This explains why all modalized sentences, even with a necessity modal, are ‘weaker’ than a non-modalized assertion (pace von Fintel and Gilles 2010; for recent critical discussion see also Lassiter 2013): there are worlds in the modal base \( \cap \{f(w) \mid p \text{ is not true, and the actual world may turn out to be one of those worlds.} \) Just to make sure that we appreciate this, consider the following case:
Context: Ariadne is sneezing, has a fever, watery eyes, etc.

B: She must have the flu.

a. Prepi na exi gripi.
   must subj have.3sg flu

b. Tha exi gripi.
   must have.3sg flu

c. Exi gripi.
   She has the flu.

The doctor is assessing, and given what he knows (the symptoms, his knowledge of what the symptoms mean, the time of the year, etc) he concludes, in c, that Ariadne has the flu. In all the worlds compatible with his knowledge/evidence, etc., this is his verdict, he is absolutely certain about it. However, if he chooses a modal version, even with stronger modals such as tha or must (which is Greek can also combine), his modal base allows also for worlds in which Ariadne does not have the flu (non-p) but e.g. an allergy, or pneumonia. The doctor’s judgment may be that these worlds are not the correct basis for forming his current diagnose, they are not best (in the sense of Portner); but they are there in the modal base. The more of those non-p worlds the doctor allows, or the more he allows them to influence his judgment, the less certain he becomes. If the doctor wants to exclude non-p worlds, he must make the stronger statement without must/tha/prepi, that relies on a veridical epistemic space which is homegenous: all worlds compatible with what he considers as the basis for his diagnose are p worlds.

The bottomline of this discussion is that tha can also be used as a non-predictive epistemic modal. In force, it is equivalent to must, and the modal base (∩f(w)) is epistemic:

\[
\begin{align*}
[\text{prepi/tha/MUST}]w,f,g = \lambda q<st>. \forall w' \in \text{Best}_g(w): q(w') = 1;
\end{align*}
\]

where \(\text{Best}_g(w)(X)\) selects the most ideal worlds from \(X\), given the ordering given by \(g(w)\).

Crucially, only in the Best worlds is \(p\) true, therefore the universal modal is nonveridical. In terms of truth conditions, then, in this analysis FUT and must are equivalent. In Greek, in fact, they can co-occur creating modal concord: e.g. a very common variant of (27) is Tha prepi na exi gripi “She must have the flu”. Tha prepi, to all intents and purposes is equivalent to either 27a or b.

In epistemic weakening, the future particle— as well as must/will— look a lot like German discourse particles such as wohl, also known to contribute weakening (Zimmermann 2011):

a. Max ist wohl auf See. (example from Zimmermann 2011)
   Max is prt at sea
   John must be in the sea.

b. (For all I know) John will be in the sea.

The purely epistemic uses of will certainly fall under weakening too. In the same spirit as that I am arguing here, Zimmermann claims that with wohl, the epistemic commitment of the speaker is weakened:
Likewise, if I know for sure, I can’t utter *Tha ine sti thalasa*. Giannakidou and Mari make a similar observation about direct evidence: e.g. while raining, I cannot utter FUT p:

If we are directly evidencing the rain, then we know that the sentence ‘It is raining’ is true; the modalized statement is therefore an infelicitous choice, violating Gricean quantity by saying something weaker than what you know. In Giannakidou and Mari, we took this case to illustrate an evidential component— but generally we can think of this as a case of incompatibility between the epistemic weakening function of *tha, wohl, must*— which require that the speaker be in an epistemic state that is compatible with both *p* and *non-p*— and the fact that in direct perception contexts the speaker in fact *knows p*. So, we can think of epistemic weakening as a presupposition that constrains the distribution of the expressions that have it.

Crucially, *zullen* seems to also function as epistemic weakener, as we see in the sentences below. The Dutch counterpart of *wohl, wel* can also combine with *zullen* (and we can think of this as modal concord too, on a par with co-occurrences of *tha* and *prepi* mentioned earlier):

Since *zullen* also functions as an epistemic weakener, its epistemic modality goes beyond the predictive modality and orientation after *now* that Broekhuis and Verkuyl are trying to capture. In Giannakidou and Mari 2012, 2013 we take pains to show that both epistemic weakening and the predictive modality of FUT rely on knowledge of the speaker, so they are profoundly epistemic in this sense. But the purely epistemic reading doesn’t make a prediction about the future.

The important generalization about epistemic weakening here is that future words crosslinguistically, regardless of their status as bound morphemes (Italian), particles (Greek), or auxiliaries (English, Dutch) all seem to have purely epistemic uses *without* reference to the future. And if the analysis I suggested about epistemic weakening is correct, then future words associate with purely epistemic modal bases.
I move on now, finally, to offer some comments on the modality of prediction. In this case, we will note that we need a mix of epistemic and metaphysical modality.

### 3.2 Epistemic constraints on the predictive reading

I just claimed that the future morphemes rely on epistemic modality for non-predictive readings. However, since future events have not occurred yet, the future is epistemically uncertain (nonveridical), or ‘unsettled’ (Kaufmann 2005, Kaufmann et al. 2006), as noted at the beginning. The speaker can simply not know future facts because there are no future facts yet. So, Giannakidou and Mari 2013 argue, in the predictive reading the modal base of future morphemes cannot be epistemic. It can also not be doxastic, because that would allow unjustified beliefs to enter the reasoning with futures.

At the same time, prediction does have an epistemic basis. So, what is the role that knowledge plays in predictive use? Broekhuis and Verkuyl say that speakers “feel sufficiently confident to say $p$ is true at $n$ or is to be made true at $i$. This confidence relies on information judged as reliable and well-founded” at present. But what does it mean to “be confident that the proposition is to be made true”? This confidence relies on knowledge at the present, but it is not itself knowledge of future events, since these have not yet been fully materialized. Now, it is conceivable that in the extended present analysis, future events partly materialize in the prospective interval of present; still, however, unless completed in that interval, events cannot strictly speaking be known to the speaker at present. So, the metaphysical and epistemic indeterminacy of the future seems to remain even in the extended present analysis.

Giannakidou and Mari 2013 argue that the speaker uses her knowledge as a domain restriction, i.e. to consider only a subset of available metaphysical future alternatives. Although the future is unknown since objectively it hasn’t happened yet, speakers project their knowledge to clean up the metaphysical alternatives, to carve them out into reasonable and unreasonable ones. Reasonable futures are those where everything proceeds as expected and nothing peculiar happens (see Mari 2013, and Giannakidou and Mari 2013 for more details). The knowledge a speaker has at present allows them to know which metaphysical branches will be reasonable, and which not. E.g. in the figure below, the dotted line to $w_3$ indicates unreasonable future:

\[
(58) \quad \text{ReasFut}(t) = \{w_1, w_2, w_0, w_4\}
\]

![Diagram](image.png)

Figure 4: Reasonable Future Worlds (ReasFut)
Now consider the sentence *John will be here at 5*.

The event unfolds in the actual world $w_0$ which has a reasonable development $w_1$. The sentence then says that if the course of events remains reasonable, the speaker is highly confident that John will be here at 5.

However, it is still possible that an accident happens. In this case, the actual world-to-come becomes an unreasonable one:

When we predict, we normally don’t consider as relevant such possibilities—but if we know that John is prone to accidents they become relevant, in which case the force of our prediction (*John will be here at 5*) becomes weaker. Giannakidou and Mari claim that such a mixed analysis, where the speaker’s knowledge domain restricts the metaphysical alternatives is better suited for the predictive reading, than a purely epistemic analysis.

It will be impossible to consider this approach in any detail here, but I think it is helpful to elaborate briefly on some key examples from adverbs that further motivate it. The facts are relevant for Dutch. Consider the following examples from Italian, Greek, English, Dutch:

(33) Arrivera forse/probabilmente/certamente alle 4.
    'He will maybe/probably/certainly arrive at 4’

(34) O Janis tha erthi sigoura/malon/isos stis 4.
    John will some definitely/probably/maybe at 4
John will definitely come at 4.
John will probably come at 4.
Maybe John will come at 4.

(35) Jan zal zekker/miscshien/waarschijnlijk hier zijn om 4.
John will certainly/maybe/definitely be here at 4.

We notice here a remarkable flexibility in all four languages: futures combine with a wide range of adverbs from high to low probability. Notice also the numeral adverbials below:

(36)  

<table>
<thead>
<tr>
<th></th>
<th>Kata</th>
<th>Greek</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>30%, 50%, 90% O Janis tha erthi stis 5.</td>
<td></td>
</tr>
<tr>
<td>b</td>
<td>Er is 30%, 50%, 90% kans dat Jan zal op 5 uur hier zijn.</td>
<td>Dutch</td>
</tr>
<tr>
<td>c</td>
<td>There is a 30%, 50%, 90% chance that John will be here at 5.</td>
<td>English</td>
</tr>
</tbody>
</table>

The probability measure can range as low as 30%, something clearly indicating that in the predictive reading, the future particles do not necessarily carry high confidence. Giannakidou and Mari, in line with Broekhuis and Verkuyl, suggest that by default indeed the force of confidence is high, but in the presence of specific adverbs we see that futures are compatible with variable confidence. These data, to my knowledge quite novel, show that when we predict, we seem use probability measures that are highly sensitive to what the speaker knows or takes as a reliable information. What do these probability measures do?

Giannakidou 2002 argued that the use of probability measures support the gradability based accounts of modality such as Lassiter 2011, and that the adverbs compose with \( \text{FUT}p \). Giannakidou and Mari 2013 claim that the adverbs do not directly compose with \( p \) or \( \text{FUT}p \): given the variability in force it is impossible to combine FUT (a universal) with the adverbs in a modal concord like manner. Even the most flexible theories of modal concord (such as Huitink 2012) would require at least matching force. So, the adverb is forced to contribute at the non-at issue level, something consistent with the fact that modal adverbs are speaker oriented (Ernst 2009) and seem to ‘scope’ high in the sentence (Ernst therefore argued that they are positive polarity items). I will take it here that modal adverbs contribute a presupposition that there is a measure of confidence in the assessment of the epistemic agent \( a \) which measures how confident \( a \) is that the actual world will be within the set of the reasonable (or best, in the purely epistemic reading) worlds. As Giannakidou and Mari 2013 suggest, one could see this as a generalized contribution of epistemic modals: they do not just make a claim about possible worlds, but bear relevance to whether an epistemic agent \( a \) thinks that the actual world is one that conforms to the best or reasonable ordering, and to what degree. Here is how we put this all together:

(37) Giannakidou and Mari 2013: purely epistemic reading

\( \text{FUT} p \) asserts \textit{necessarily} \( p \), relative to an epistemic modal base and an epistemic agent \( i \).

\textit{Presupposition}: there is a measure function \( \mu_{\text{confidence}} \) determined by \( i \) that measures how confident \( i \) is that the actual world will be within the set of the best worlds. The default value of \( \mu_{\text{confidence}} \) will range above 70%.
Truth condition: $p$ is true only in the best worlds, given the evidence: $\forall w' \in Best_{g(w)}(\bigcap f(w)) : p(w') = 1$.

(38) Giannakidou and Mari 2013: predictive reading

FUT(NON-PAST(p)) = 1 iff $\forall w' \in ReasFut(t_u) : \exists t' \in [t_u, \infty) : \land p(w't')$

Presupposition: There is a measure function that measures the speaker’s confidence that the actual-world-to-come will be in ReasFut($t_u$). The default value of the adverb is above 70%. Truth condition: $p$ is true only in the the reasonable futures, given the evidence: $\forall w' \in Best_{g(w)}(\bigcap f(w)) : p(w') = 1$. All reasonable futures are $p$ futures.

In other worlds, the modality of prediction consists in the following: (i) determining via present knowledge what the metaphysical alternatives are in which $p$ comes out true; (ii) not knowing whether the actual world to come will be one of these metaphysical alternatives and (iii) the speaker believing or being convinced that the actual world to come will be one of these alternatives. Broekhuis and Verkuyl’s analysis of extended present offers a strong basis for (iii): the speaker believes or is convinced that the actual world to come will be among the reasonable branches because she reasons with the present, and the present interval contains facts that develop prospectively, into the future.

4 Conclusions

The paper by Broekhuis and Verkuyl is extremely rich in observations and ideas, and quite ambitious in its scope. Limited by space, I was unable to address every aspect of the system in this response— but I think it is fair to say that Binary Tense and Modality presents a new perspective for the analysis of tense, and indeed one that addresses convincingly well-known shortcomings or inconsistencies of the previous literature. In my response, I focused especially on the present and future, because I find the treatment of these categories appealing and promising, as it offers new ways of addressing old questions and understanding new phenomena. The relation Broekhuis and Verkuyl propose between a semantic present as an interval and the future, as well as their analysis of the Dutch future auxiliary zullen as a modalm are well argued for— and I hope to have shown that they jointly allow us, with certain refinements, to capture crosslinguistic generalizations about present tenses and future morphemes that go beyond Dutch alone. In the course of the discussion, we also found similarities, in terms of epistemic weakening (Giannakidou 2012, to appear, Zimmermann 2011), between the future auxiliaries and modal particles such as wohl and wel (including the Greek future), which are worth further exploring. The very fact that future words, in a number of languages including English, contribute epistemic modality without predictive reading, supports strongly the analysis of ‘future’ as an epistemic rather than temporal category.

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