About determiners on event descriptions, about time being like space (when we talk), and about one particularly strange construction

Sabine Iatridou

Abstract   This paper should be read against the backdrop of three lines of linguistic investigation: (1) the investigation of the Perfect construction, which has received considerable attention, going back to Reichenbach (Elements of symbolic logic, 1947); (2) the working hypothesis that certain verbal constructions can be described in terms of the semantics of determiners on nominal expressions, with which we are more familiar; (3) the common observation that we talk about time the way we talk about space. The focus of the paper is a particular construction in Greek. As always, however, the search for the solution of a particular question reveals many other questions in the process and this paper should be seen as being also about a number of related puzzles in English and other languages.

Keywords   Aspect · Tense · Perfect · (In) definiteness · Free choice · Presupposition

1 The basic puzzle

The Greek construction at the center of this investigation is shown and glossed in (1). I will leave the translation for later:

(1) Echo   tria   chronia na dho   ton   Mano.
     have.1sg.Prs three years   *na* see.1sg the.ACC Manos.ACC

Our first step will be to look at some of the morphosyntactic properties of (1), none of which exhibit anything unusual within the Greek context.

S. Iatridou (✉)
MIT, Cambridge, MA, USA
e-mail: iatridou@mit.edu

Throughout, the INFL-area particle *na* will be glossed as 'na'. This element is not particular to (1) at all. For ease (though not quite accurately), the reader can liken it to English infinitival *to*. A basic rule of thumb is that embedded *na*-clauses appear where Romance has either the subjunctive or the infinitive. Embedded *na*-clauses appear as complements to, e.g., volitionals, directives, and modals, but also to perception verbs, implicatives, and causatives. That is, *na* is not uniformly marked for factivity or veridicality, nor is it marked for their opposite. For example, in (2) it appears in the complement of a volitional, and in (3) in the complement of an implicative verb:[1]

(2) Thelo   na figo.
     want.1sg *na* leave.1sg
     'I want to leave.'

(3) Katafera   na figo.
     manage.1sg *na* leave.1sg
     'I managed to leave.'

Even though *na* appears in a large number of environments, I will be using the misnomer shorthand label "the *na*-construction" to refer specifically to the construction in (1).

The embedded verb carries agreement. This is not particular to the *na*-construction under investigation either. All embedded *na*-clauses have agreement on the verb, as illustrated by (2) and (3) above. Like other Balkan Sprachbund languages, Greek lacks infinitival complements.

The proper name *Manos*[2] in (1) has a definite article, but this is not particular to the *na*-construction either. All proper names always take the definite article in Greek.

There is a certain freedom of word order available to (1). The bracketed constituents can appear in many different permutations.

(4) [Echo]   [tria   chronia] [na dho   [ton Mano]].
     [have.1sg.Prs] [three years]   [*na* see.1sg [the Manos]]

But this is also not particular to the *na*-construction, as Greek has a variety of mechanisms that can affect its word order.

So for all that non-Greek speakers know, the *na*-construction in (1) could just as well be glossed as follows:

---

[1] The literature on *na* is considerable; it includes (but is not limited to) Philippaki-Warburton 1993, 1998; Philippaki-Warburton and Veloudis 1984; Tsoulas 1994; Giannakidou 2009; Roussou 2010. The particle *na* can be separated from the verb only by negation and object clitics. However, the literature is divided with respect to the question of where in the tree *na* is located. For some it is a complementizer, whereas for others it appears in INFL, i.e. the area where verbal functional categories like Mood are found. For the purposes of this paper, I will assume that *na* is an INFL-area particle, without associating it with Mood in particular. As far as I can tell, nothing hinges on this choice here. What *is* important to note, however, is that the patterns we are about to observe are not the result of the use of *na* alone in any obvious way.

[2] '*Mano*' is the Accusative. The Nominative is '*Manos*'. I will retain the Nominative form in the glosses and translation, as this is the citation form.

(5) I have three years to see Manos.

Or, if one takes into account some of the word order permutations:

(6) I have to see Manos three years.

But neither of these remotely approximates the meaning of this construction. In effect, the main meaning ingredient (though we will see that there are more) of the *na*-construction is that **the last time I saw Manos was three years ago.** However, there is no 'for the last time' in evidence anywhere in (1), nor any 'ago', nor is there any verb in the Past tense.

Here is (a first approximation to) the schematic representation of the sentence's truth conditions, where "UT" stands for 'utterance time':

(7) event $_{I\ see\ Manos}$ UT
     |………………..…….3 years………………..……...|

Part of the meaning of the *na*-construction is that there is a time span which does not contain any events of my seeing Manos, hence the use of "the last time …" in the paraphrase. So following up (1) with "…and/but I saw him a month ago" creates a contradiction. But even though the three-year time span does not contain events of my seeing Manos, there is no negation in evidence in (1) either.

The temporal measure phrase is a necessary component of the *na*-construction. The string without it, as in (8) below, is grammatical, but it has a completely different meaning:

(8) Echo   na dho   ton   Mano.
     have.1sg.Prs *na* see.1sg the.ACC Manos.ACC
     'I have to / am supposed to see Manos.'

This reveals the compositionality problem that we are faced with here: the string in (8) is a substring of (1). But the meaning of (1) is not derivable from the meaning of (8) plus the meaning of *three years* in any obvious way.[3]

---

[3] It is actually not impossible to get (8) to have the meaning of (1) without the temporal measure phrase, but this can be done only if one accompanies the utterance by a particular gesture with one's hand, circling clockwise at the elbow or wrist (if one is right-handed; counter-clockwise if left-handed), which here indicates 'a long time'. This gesture actually means 'a lot' in general. If it accompanies (i) or (ii), the compounded meaning is that I walked a lot or I ate a lot, respectively:

(i)   Perpatisa.
      walk.1sg.Pst.Prf
      'I walked.'
(ii) Efaga.
      ate.1sg.Pst.Prf
      'I ate.'

2 Is there an English equivalent to the *na*-construction?

An English construction that may come to mind as a candidate for conveying the relevant meaning is the negated Perfect:

(9) I haven't seen Manos in three years.

Certainly, (9) could be given a paraphrase that could be schematically represented as in (7). However, there is at least one very important difference between the *na*-construction and the negated Perfect in English. In the *na*-construction, the event described must have happened. That is, it is impossible to follow an utterance like (10) (the 3rd person version of (1)) with either (10a) or (10b):

(10) Echi   tria   chronia na dhi   ton   Mano…
      have.3sg.Prs three years   *na* see.3sg the.ACC Manos.ACC
      a. # ……but I don't know if he has ever seen him.
      b. #……but he has, in fact, never seen him.

On the other hand, such continuations are just fine in the negated Perfect:

(11) A: Has the patient ever had a seizure?
      B: He hasn't had one in the last five years, but that is as far as my records go
          back. I don't know about earlier.
      B′: He hasn't had one in the five years that I have been working here. I don't
          know about earlier.
      B″: He hasn't had a seizure in the last five years. In fact, he has never had one.

In other words, in the negated Perfect, the existence of the event is a conversational implicature and can be canceled.

In the *na*-construction, on the other hand, the occurrence of the event is not cancelable and is, in fact, a presupposition. Standard presupposition tests point to this conclusion. Thus the presupposition survives both negation and questioning:

(12) Dhen echo   tria   chronia na dho   ton   Mano.
      NEG have.1sg.Prs three years   *na* see.1sg the.ACC Manos.ACC
          => I saw Manos
      (rough paraphrase: 'The last time I saw Manos was not three years ago.')

(13) Echi   tria   chronia na dhi   ton   Mano?
      have.3sg.Prs three years   *na* see.3sg the.ACC Manos.ACC
          => she saw Manos
      (rough paraphrase: 'Was the last time she saw Manos three years ago?')

We will return later to the existence presupposition in the *na*-construction. In the remainder of this section, we will look at why the inference of the existence of the event is only a conversational implicature in the negated Perfect. We will start with

some basic background on the Perfect that will be useful throughout this paper. Here I will follow Iatridou et al. (2001), but other theories of the Perfect would work as well.[4]

The functional material associated with the Perfect is lower than Tense and higher than the projection containing the aspectual specification for imperfective and perfective, which, in turn, is above the v/VP: [Tense [Perfect [(Im)perfective [v/VP]]]]. According to Iatridou et al. (2001), the Perfect introduces an additional time interval in the representation of the sentence, the 'Perfect Time Span' (PTS) (Possibly the existence of the PTS is a presupposition, not an assertion of the Perfect.). Like all time spans, the PTS is defined by its boundaries. In a sentence like (14), the Left Boundary (LB) of the PTS is set up by the adverbial *since*[5] and the Right Boundary (RB) is manipulated by Tense. Since (14) is a Present Perfect, RB is at the Utterance Time (UT) (we will shortly see examples with different tenses). Functional categories below the Perfect, as well as the VP, determine placement of the event description in the PTS. The Perfect in (14) is the Present Perfect of the Perfective (as opposed to the Perfect of the Progressive), and the result is existential quantification over points or subintervals of the PTS. This is summarized in (15).

(14) I have visited Cape Cod three times since 1990.

(15) a. There is a time span (the Perfect Time Span/PTS);
      b. the Right Boundary of the PTS is the time of utterance;
      c. the Left Boundary of the PTS is (some time in) 1990;
      d. in the PTS there are three subintervals at which it is true that I visit Cape Cod.
      e. $\exists t : RB(u, t)$ and $LB (1990, t)$ and $\exists t', t'', t''' \subseteq t$: I visit Cape Cod at t', t'', t'''
      f.

$$
\begin{array}{llll}
1990 & & & \text{UT} \\
\text{LB} \quad\quad \checkmark \quad\quad\quad \checkmark \quad\quad\quad \checkmark & & & \text{RB} \\
|\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots|
\end{array}
$$

(Perfect Time Span/PTS)

In general, the LB of the PTS can be set by an adverb, as in (14). In the absence of an adverbial, it is set contextually, including sometimes at the beginning of the subject's life:

(16) I have visited Cape Cod three times. (=since the beginning of my life)

On the other hand, the RB of the PTS is manipulated by Tense. In the Present Perfect in (14), RB is at UT. In the Past Perfect, RB is placed before UT, as shown in (17a), whereas in the Future Perfect, RB is placed after UT, as shown in (17b).

---

[4] See Portner (2011) for more references and an overview of different ideas about the Perfect.

[5] There is also a causal *since* in English:

(i) Since her son is sick she decided to stay home.

I do not know any reason for this homophony.
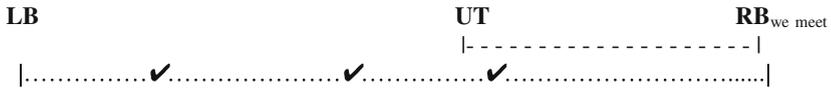
(17) a. *Past Perfect*:

When we met, I had visited Cape Cod three times.

LB   **RB**$_{\text{we meet}}$ **UT**
|............✔............✔........................✔...........…......|- - - - - - - - - - - - - - -|

$\exists t : RB(<u, t)$ and $LB (1990, t)$ and $\exists t', t'', t''' \subseteq t :$ I visit Cape Cod at t', t'', t'''

b. *Future Perfect*:[6]

When we meet again, I will have visited Cape Cod three times

LB   **UT**   **RB**$_{\text{we meet}}$
                                                     |- - - - - - - - - - - - - - - - - -|
  |...............✔....................✔..............✔...............................…....|

$\exists t : RB(>u, t)$ and $LB (1990, t)$ and $\exists t', t'', t''' \subseteq t :$ I visit Cape Cod at t', t'', t'''

In the negated Perfect (18), the introduction of negation affects (15), resulting in (19), with the changes underlined:

(18) I haven't visited Cape Cod since 1990.

(19) a. There is a time span (the Perfect Time Span/PTS);
      b. the RB is the time of utterance;
      c. the LB is (some time in) 1990;
      d. <u>it is not the case</u> that in the PTS there is a subinterval at which I visit the Cape
          = there is <u>no</u> event of my visiting the Cape in the PTS.
      e. $\exists t : RB(u, t)$ and $LB (1990, t)$ and $\simeq \exists t' \subseteq t :$ I visit Cape Cod at t'

In other words, in the Perfect, the existence of the event is part of the assertion. When the Perfect is negated, the assertion is that there is no relevant event in the PTS.

But how does the implicature of a prior event come about? If there is a LB-adverbial like *since 1990* or *in the last five years*, the cooperative speaker will infer that while there is no relevant event within the PTS, there may be one outside the

---

[6] In the schematic representation in (17b), there happen to be two event occurrences before UT and one after, but this is not necessary. The Future Perfect is underspecified with respect to where the events occur with respect to UT. All that is asserted is that the events are in the PTS. Pragmatic factors can trigger the inference that a given event is after UT, but such inference is cancelable:

(i)   She is a very good student and she will definitely have finished the assignment by Monday. For all I know, she may have finished it already.

We do not see this sort of under-determination of where an event is with respect to UT in the Present or Past Perfects. The reason is that since the event falls into the PTS, if the RB of the PTS is at or before UT, the event will occur before UT. This rationale also leads to the conclusion that there is no separate anteriority operator in the Perfect: the Perfect asserts the occurrence of the event to have happened before UT in the Present and Past Perfects and leaves it under-determined with respect to UT in the Future Perfect.

PTS. Otherwise, why would the speaker bother to point out the non-existence of the event *in a specific time span?*

(20) He has not had a seizure in the last five years.

Here is a topological analogue that makes the same point:

(21) In her living room, she doesn't have a Vermeer.

There likely is an inference—possibly a strong inference—that there is a seizure outside of the PTS in (20), just as there likely is an inference that there is a Vermeer somewhere other than in the living room in (21). Importantly, however, despite their salience these are mere conversational implicatures. In other words, they are cancelable.

In short, we have established that in the *na*-construction there is an existential presupposition on the event, while in the negated Perfect the existence of the event is merely conversationally implicated.[7] The conclusion must be that the *na*-construction and the negated Perfect are not equivalent.

3 Another comparison with English

Consider (22):

(22) It has been three years since his cat died.

I will be referring to (22) as the "*since*-construction," even though, again, this is not a good name because *since* appears in garden variety Perfects as well.[8]

The *since*-construction is basically a Perfect in that it sets up a PTS (like any Perfect), but furthermore, it also measures that PTS:

(23) event $_{his\ cat\ dies}$ UT
      LB   RB

     |…………….3 years……………………………............|

LB is the event description in the *since*-adverbial, in keeping with the general role of *since*-adverbials in the Perfect, as noted. Meanwhile, as in any Perfect, RB is manipulated by Tense.

---

[7] Noah Constant (p.c.) points out that the inference is not cancelable with the negative polarity LB-adverbial *in years*. See Iatridou and Zeijlstra (2014) for an explanation of what is referred to there as "Constant's observation."

[8] Greek, like many other languages, has the equivalent of the *since*-construction. Because it is so similar to the English *since*-construction, I will deal only with the latter in the main text. In Appendix 2, I discuss the specifics of the Greek *since*-construction in some detail.

(24) *Since-construction* + *Past*:

I saw Mary last week. It had been three years since her cat died.

event $_{cat\ dies}$ last week/event $_{I\ see\ Mary}$
  LB   RB   UT
    |…….3 years……………………| - - - - - - - - - - - - |
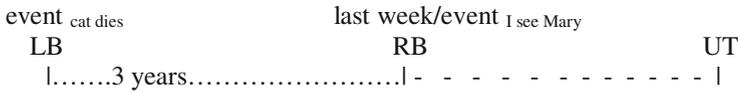
(25) *Since-construction* + *Future*:

In one month, it will have been three years since her cat died.

                                               | - - - -1 month- - - - |
     LB   UT   RB
     |……………..3 years………………………………………..|

The *since*-construction and the *na*-construction have many things in common:

    1. As in the *na*-construction, in the *since*-construction the time span apparently must be lacking in events of the relevant sort:

(26) I saw him a year ago and again last week. #It has been a year since I saw him.

2. As in the *na*-construction, in the *since*-construction the existence of the event is not cancelable:

(27) It has been five years since he had a seizure. #In fact, he has never had one.

3. As in the *na*-construction, in the *since*-construction the existence of the event is presupposed (not merely asserted). It survives under negation:[9]

(28) It has not been five years since he was convicted of drunk driving.

And it survives in questions:

(29) a. How long has it been since you were convicted of drunk driving?
      b. Has it been five years since you were convicted of drunk driving?

    The conclusion that the event in the *since*-construction is presupposed also correctly predicts the status of dialogues like the following:

(30) A: What happened? Where is Bill?
      B: Bill broke his arm three hours ago (and now he is in the hospital)
      B: #It has been three hours since Bill broke his arm
          (and now he is in the hospital).

---

[9] A reviewer worries that the negation may not be high enough in (28) for this sentence to count as a valid projection test. However, it is possible to test that the *since*-cause is indeed lower than the negation, since it can move away from it or ellide, leaving negation behind:

(i)   … but three years since I met him, it has not been.
(ii)   Has it been three years since you met him? It has not (been three years (since I met him)).

Facts of this sort add to the evidence that in both the *na-* and *since*-constructions, the existence of the event is presupposed. We will return later to what yields the existential presupposition in the case of the *na*-construction. Focusing on the *since*-construction, it is important to understand why the existence of the event is presupposed. Consider (22, 23) again, repeated below, and the topological analogues in (31):

(22) It has been three years since his cat died.

(23) LB$_{\text{cat dies}}$ RB/UT
     |……….….3 years……………………….........|

(31) a. There are [three years]$_\alpha$ [in a certain space]$_\beta$
      b. There are [three liters of water]$_\alpha$ [in a certain space]$_\beta$

As has been pointed out numerous times, we talk about time the way we talk about space. As we said earlier, the assertion of the *since*-construction is an assertion about the size of a certain temporal space. What defines a space is its boundaries. Without those, the space is undefined/non-existent. The existence of these boundaries is, therefore, presupposed. All of this holds in general.

In the *since*-construction, one of the boundaries of the temporal space, specifically the LB, is the event description in the *since*-clause. Since the event description names the LB, and since the LB is presupposed to exist, the existence of the event is presupposed.

4. As in the *na*-construction, in the *since*-construction the temporal measure phrase is obligatory:

(32) It has been *(three years) since his cat died.

The reason is that in both constructions the assertion is about the size of the time span, and the measure phrase specifies exactly that.

5. We saw that in the *since*-construction, the RB of the time span is manipulated by tense. The same holds for the *na*-construction.

(33) *Na-construction* + *Past*:
    Prin   apo   dhio mines icha   tria chronia na dho ton Mano.
    before from 2   months have.1sg.Pst 3   years   *na* see the Manos.
    Rough paraphrase:
    'Two months ago, it had been three years since the last time I saw Manos.'

    event $_{\text{I see Manos}}$ UT
     | |------2 months------|
       LB   RB
     |…………….3 years……………….…..........|

(34) *Na-construction + Future*:

> Se   dhio   mines   tha   echo   tria   chronia   na   dho ton Mano.
> in   2   months   FUT   have.1sg 3   years   *na* see the Manos.
> Rough paraphrase:
> 'In two months, it will have been three years since the last time I saw Manos.'

> event $_\text{I see Manos}$ UT
> | |----2 months------|
>   LB   RB
> |…………….3 years………………………………….........|

In summary, the *na*-construction and the *since*-construction have many things in common, including:

A. The existence of the event is presupposed (not implicated or asserted)
B. The assertion of the sentence is not about the existence of an event but about the size of the temporal distance between that event and the evaluation time (the time of utterance in the case of the Present Tense). This is why the temporal measure phrase is necessary in both.

However, in the next sections we will see that, despite their many similarities, the *na*-construction and the *since*-construction are not equivalent.

4 The *since*-clause: a definite event description

We have already seen that the *since*-construction comes with an existential presupposition on the event. Now we will see that there is a uniqueness presupposition as well. The combination of presuppositions of existence and uniqueness is the hallmark of a singular definite description (Frege 1892). In other words, the *since*-adverbial grammaticalizes a singular definite event description, even though there is no definite determiner in sight.[10,11]

Compare the unobjectionable discourse in (35) to the problematic one in (36):

(35) a. John got married in St.Patrick's Cathedral.
      b. It has been five years since he got married.

(36) a. John got married three times in St.Patrick's Cathedral.
      b. ?#It has been five years since he got married.

The oddness of (36b) is akin to that of (37):

(37) (when there are five books on the table)
      #I will give you the book that is on the table.

---

[10] This holds for the *since*-adverbial in any Perfect, not just in the *since*-construction.

[11] The hypothesis that certain verbal constructions provide event descriptions with distinct determiner meanings is not new; see Portner (1995), Baker and Travis (1997), Beghelli (1998), among others. See Appendix 1 for a discussion of Tsoulas (1994), in particular.

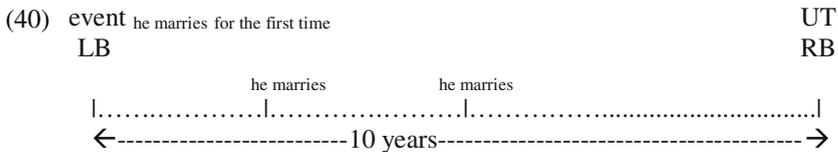We can fix the oddness of (36b) by adding *the last time*:

(38) a. John got married three times in St. Patrick's.
     b. It has been five years since he got married there (for[12]) the last time.

What we are doing by adding *(for) the last time* is creating a unique event description. There is only one event that fits the description *get married in St. Patrick's Cathedral (for) the last time*. But there is nothing magical about *the last time*. We could have chosen any modifier that creates a unique event description:

(39) a. John got married three times in St.Patrick's Cathedral.
     b. It has been ten years since he got married for the first time.

There is only one event that fits the event description *get married for the first time*.

The schematic representation of (39b) is as in (40):

(40) event _{he marries for the first time}   UT
   LB   RB

                        he marries   he marries
   |……….…………|…………….………|……………...............................|
   ←------------------------10 years--→

We see that while the time span is not free of events of John getting married, it is in fact, free of events of him getting married for the first time. The same holds if we had said *since he got married for the second time*. All we need is to come up with an event description that only one event will satisfy.

However, there are apparent counterexamples to the claim that the event in the *since*-clause has to be unique. Consider (41):

(41) It has been one week since I went to the hairdresser
     (and already my hair is a mess).

Sentence (41) seems to be a counterexample insofar as there is clearly no inference that I have been to the hairdresser only once. What can we do to save the account? It would not do to postulate a covert *for the last time* inside the *since*-clause because then we would be making the wrong prediction for events that are, in fact, unique. For example, (42a) would be wrongly predicted to have the status of (42b).

---

[12] For some speakers, *for the last time*, as opposed to *the last time*, strongly suggests that the event will not occur again. This is irrelevant in the present context.

(42) a. It has been ten years since his cat died.

$$=/=$$

     b. #It has been ten years since his cat died for the last time.

And saying that there is an optional *for the last time* does not seem very inspired as a solution.

However, in actuality, (41) is not a counterexample at all, as we shall argue now. To start, we note that in general, a question gets an exhaustive answer:

(43) A: Who was at the party last night?
     B: Mary, Sue, Katie, Fred, and Caleb.
     B′: # Fred. (#, if B knows that all of the above came)

But this is not always necessary.[13] Consider (44):

(44) A: When did you get a haircut?
     B: (#) In 1964 I went in February, July, and October. In 1965 I went in January, etc.
     B′: Last Tuesday.

The answer in (44B′) counts as a perfectly fine answer, whereas (43B′) does not, because a question asks for the most informative answer that can be given. Often, the most informative answer involves exhaustivity, as in (43). But not so in (44). Rather, what matters is that you are only as good as your most recent haircut; previous haircuts are irrelevant. Therefore, (44B′) is a perfectly informative answer.[14]

Moreover, it can also be the case that it's not the most recent haircut that is the most relevant one. Imagine you have an old friend who used to have very long hair. You have not seen her for three years but she is standing in front of you now. You notice that she now has extremely short hair.

(45) You: When did you cut your hair?
     Your friend: Last year.

Your friend's answer does not imply that she hasn't had her hair cut since last year. But she answered your question about the transition from long hair to short hair cooperatively.

We conclude that (41) is not a counterexample after all: the definite event description, like any good definite description, can pick out the most salient individual. (41) is fine because the most recent haircut is the most salient one. Meanwhile your friend, the one who had long hair for a long time but switched to

---

[13] The observation that questions do not always call for an exhaustive answer was made in Groenendijk and Stokhof (1984).

[14] On the other hand, (44B) violates the Maxim of Relevance.

very short hair, can say (46) without conveying that she hasn't had a haircut in the last two years:[15]

(46)   It has been two years since I cut my hair, and I am still not used to my new look.

In short, for the *since*-clause to be used felicitously, there should either be a unique event that fits its description, or a uniquely salient one.

Earlier we said that the existence presupposition of the event is the result of the existence presupposition of a LB of the time span that is set up in the Perfect. Spaces, temporal or topological, are uniquely defined by their boundaries. Without boundaries they do not exist. The uniqueness presupposition is similarly derived: temporal spaces are defined by two boundaries only, LB and RB. Each of these has to be uniquely defined. Therefore, LB has to be uniquely defined. Therefore, the event description that names the LB is per force uniquely referring.

Summarizing this section, we have seen, first, that in the *since*-construction, the assertion is about the size of the PTS. The PTS is set up as in any other Perfect: its LB is given by the event description and its RB by Tense. From this observation we derived the fact that the event is presupposed: it is one of the boundaries of the temporal space whose size is measured. The boundaries of any space are presupposed to exist, otherwise the space in question does not exist. For the same reason, the event description has to pick out a unique or uniquely salient event. We also noted that the time span can be devoid of events of the relevant sort: this happens when the LB event is unique. If it is unique, there are obviously no other events anywhere. If the LB event description picks out not a unique event, but a uniquely salient one which is not the final one in a series, then there can be events of the relevant sort within the time span. Finally, we saw that language contains definite descriptions of categories other than noun phrases. That is, there are definite descriptions without the category that we would call 'determiner'. This point has been made earlier, for example in Tsoulas (1994) (see Appendix 2 below), Portner (1995), Baker and Travis (1997), Beghelli (1998).

---

[15] I am grateful to Pooja Paul for this particular example. Many thanks to a reviewer who pointed out that if there are multiple occurrences that fit the event description, there is no reason why the last occurrence of the event should be the only one that can function as LB. An earlier occurrence should be able to as well, if it is made sufficiently salient. The reviewer worried that this may not be possible based on the following:

(i)   Context: I have frequently planted trees on my land throughout my life.
     #It has been 40 years since I planted a tree; now I can hang a swing for my grandkids.

Indeed, as given, (i) does not sound very good, but it is not clear where the problem lies, especially since the relationship between trees and swings needs to be accommodated. We can make it work, however, if we fix the context somewhat: I have frequently planted trees on my land throughout my life. In particular, I like to plant agave trees, which have the property of needing ten years to blossom. In that context, and when we are discussing whether I have any such tree in bloom right now, I can say (possibly with obligatory stress on the auxiliary):

(ii)   It HAS been ten years since I planted one. So there should be one that will blossom this year.

I think that the reviewer's remarks were spot on; they point to the conclusion that if a prior occurrence of an event is made salient, the event description in the *since*-clause can refer to it.

Before we close this section, I would like to bring up two questions that need to be explicated, even though I will not address them in any depth. The first question regards the precise source of the definiteness on the event description. What we have seen is that the *since*-clause behave like a definite description as a whole, and I also argued that the uniqueness and existential presuppositions are the result of the PTS being presupposed to have a unique LB. Whether this is grammatically encoded in, for example, an operator inside the *since*-clause or in its Tense/Aspect specification, I leave for a different occasion.

The second question regards what the definite description is a definite description of. I have been talking about descriptions of events, but we may just as well be dealing with the definite description of a time interval, specifically the time interval associated with the event.[16] The answer to this question will partly be guided by whether one in principle prefers event semantics or interval semantics. On the basis of a phenomenon discussed in von Fintel and Iatridou (2005), I suspect that it is advantageous to see the *since*-clause as containing a definite description of a time interval. However, for the purposes of the current paper I will continue to talk about events or associated intervals.[17]

Finally, following everything we have said about it, here is a possible syntactic representation of the *since*-construction within certain basic assumptions about the representation of the Perfect:

(47) [$_{Tense}$ [$_{Perfect}$ [[$_{v/VP}$ be 5 years] [since I saw him]]]]

5 Event properties in the *na*-construction

In the previous section we saw that the *since*-construction features both an existence and a uniqueness presupposition on the event in the *since*-clause. We have also seen that the *na*-construction comes with an existence presupposition on the event. However, as we will see in this section, the *na*-construction does not trigger a

---

[16] However, see Glasbey (1992) for arguments that construction of "a temporal entity from [an] event entity" (p. 289) is not all that straightforward and that we should maintain a distinction between events and times.

[17] A *since*-adverbial can also contain a definite noun phrase:

(i) It has now been five years since the storm/the London Olympics/etc.

I have been incapable of determining whether it can take an indefinite noun phrase as well. The English speakers I consulted are split on the status of (ii):

(ii) %It has been five years since a storm/ since a concert by Bruce Springsteen.

Some (though by no means all) speakers accept (ii) in a context like the following: there is a rule according to which we cannot invite a performer if s/he has been here within the last four years. These speakers can utter (ii) followed by 'Let's invite him'. Some of the speakers who accept (ii) report that they feel it is short for *It has been five years since there was a concert by Bruce Springsteen*. It seems difficult to ascertain whether there is indeed an elliptical process going on, since the contribution of the indefinite DP would in any case yield the same meaning. However, as Jonathan Bobaljik (personal communication) points out, it is possible to read "a concert by Bruce Springsteen" in (ii) specifically, and this would not be possible with an (ellided) existential predicate in the *since*-clause.

uniqueness presupposition for the event. Stronger yet, we will see that the event cannot be known to be unique. So while the event description in the *since*-construction is a definite description, we cannot reach the same conclusion for the *na*-construction.

We saw that the *since*-construction can contain a description that is met by a unique event, as in (22), repeated below. However, in the *na*-construction this is completely impossible. Even though the paraphrase I have been giving is very rough, it will do here to illustrate the infelicity of placing a unique event description in the *na*-construction. Consider the contrast between (22) and (48):

(22) It has been three years since his cat died.

(48) *#[I gata tu]   echi   tria   chronia   na   pethani.
      [the cat his]   has   three   years   *na*   die
      Rough paraphrase: 'The last time his cat died was three years ago.'

In other words, in the *na*-construction the event has to be in principle repeatable. This need for repeatability brings out different inferences for the two constructions. The *since*-construction in (49) just conveys how much time fits between the event of the addressee getting married and UT. On the other hand, the *na*-construction implies that there is a high probability that the addressee will get married again and therefore can be taken as a rather insensitive comment about her commitment to the marriage:[18]

(49) It has been three years since you got married.

(50) Echis   tria   chronia   na   pandreftis.
      have.2sg   three   years   *na*   get-married
      Rough paraphrase: 'The last time you got married was three years ago.'

Recall that modifiers like *for the last time*, *for the second time,* etc. make the use of the *since*-construction possible where it otherwise might not have been:

(51) a. John went to the movies three times in 2014.
      b. It has been three weeks since he went to the movies # (for the first/
          second/etc. time).

Such modifiers are impossible with the *na*-construction precisely because they create uniqueness:

(52) a. John went to the movies three times in 2014.
      b. Echi   tris   evdhomadhes   na   pai   ston kinimatografo
          have.3sg   three   weeks   *na*   go   to-the cinema
          (#ya proti/defteri fora)
          (for first/second time)
      Rough paraphrase: 'The last time he went to the movies for the first/second time was three weeks ago.'

---

[18] The English negated Perfect may be a better way than the "rough paraphrase" to express the insensitivity of the *na*-construction in this context: *You haven't gotten married in three years.*

Without the modifiers *for the first time,* etc., (52b) is perfect; it conveys that three weeks have passed since the last of the three movie-going events.

In short, we see that in the *na*-construction, the event cannot be unique. Moreover, it cannot be uniquely salient either. Recall the friend who used to have long hair and cut it short two years ago, and who could utter (46), repeated below, without implying that she did not have a haircut in the last two years:

(46) It has been two years since I cut my hair, and I am still not used to my
      new look.

This showed that the event description in the *since*-clause can pick out a highly salient event, even if it was not the last occurrence of an event of the relevant type. However, the *na*-construction cannot do this. If the formerly long-haired friend says (53), she asserts that two years ago was the absolutely last haircut she had.

(53) Echo   dhio   chronia   na   kurefto.
      have.1sg   two   years   *na*   get-haircut
      Rough paraphrase: 'The last time I had a haircut was two years ago.'

In other words, in the *na*-construction the time span has to be devoid of relevant events in a more absolute sense.

6 The *na*-construction: an indefinite event description?

We saw that the behavior of the *na*-construction is clearly not that of a definite description. We also saw that there is a requirement for repeatability of the event—basically a requirement for a possible plurality of the event. This is reminiscent of indefinites, which also need a possibility for plurality. In other words, the unacceptability of (48) above is akin to the unacceptability resulting from an indefinite determiner on NPs referring to things which are presupposed/known to be unique. When a definite description is warranted, a definite description must be used and an indefinite description is infelicitous (Hawkins 1978; Heim 1991, and others):

(54) a. I watched a soccer game last night. The/*a/*one referee was very unfair.[19]
      b. I watched a married couple play chess. The/*a/*one man had no endgame.

When the context does not entail uniqueness, an indefinite must be used. That is, the possibility of plurality is required for the felicitous use of indefinites:

(55) a. I watched several games over the weekend. A/one/*the referee was unfair.
      b. I watched many married couples play chess yesterday. A/one/*the man
          had no endgame.

---

[19] The judgment given is on the assumption that there is only one referee per game.

The requirement of a "possibility for plurality" may be nothing more than a result of Heim's (1991) "Maximize Presupposition", according to which, when you can use a strong presuppositional item, you have to. Since definites have a presupposition of uniqueness, it would follow from "Maximize Presupposition" that when there is uniqueness, a definite must be used. This means that when an indefinite is felicitously used it is because the uniqueness presupposition is not satisfied. A fair amount has been written on this insight; the details of those discussions do not seem relevant in the present context.

So the working hypothesis that we are considering now is that while the *since*-construction in (56) has (57) as part of its meaning, the *na*-construction in (1), repeated below, has (58):

(56) It has been three years since I saw Manos.

(1) Echo   tria   chronia na dho   ton   Mano.
     have.1sg.Prs three   years   *na* see.1sg the.ACC Manos.ACC

(57) *Since-construction:*
      … **the** event (or associated interval) of VP (my seeing Manos)

(58) *Na-construction:*
      … **an(y)** event (or associated interval) of VP (my seeing Manos)

If this working hypothesis is worthwhile, the next step is to determine what kind of indefinite we are dealing with.

The indefinite event description in the *na*-construction cannot be a specific indefinite. That is, (1) cannot pick out a specific occurrence of the event.[20] If it could, it would have been able to refer to a specific prior occurrence of the event type, and the prediction would be that in the context in (59a), the *na*-construction (59b) (i.e. (1)) would be fine. But this is not so. In the context of (59a), (59b) is false, as illustrated in (60).

(59) a. I saw Manos three years ago, two years ago, and one year ago.
      b. Echo   tria   chronia na dho   ton   Mano.
          have.1sg   three   years   *na* see.1sg the.ACC Manos.ACC

(60) |………………..|……………….|……………….UT
      I see Manos   I see Manos   I see Manos

                          *

In other words, an analysis which assumes that we are dealing with a specific indefinite cannot guarantee that the three-year period does not include relevant events.

A further argument indicating that we are not dealing with a specific indefinite is that we cannot refer back to it, even though pronominal reference to event descriptions in other types of *na*-clauses is possible. When a *na*-clause is the complement of a volitional verb, as in (61), for example, the clitic pronoun *to* ('it') can refer back to it:

(61) Thelo [na ton dho]$_i$ alla   ta   pedhia   dhen   to$_i$ thelun.
      want   [*na* him see]$_i$ but   the   children   NEG   it$_i$ want
      'I want to see him but the children do not want this.'

However, the *na*-clause in our *na*-construction cannot be the antecedent of a pronoun. The string in (62) is fine, but the pronoun can only refer to the entire previous sentence.

(62) [Echo   pende   chronia   [na ton dho]$_i$]$_k$ alla i   Maria then   to $_{k /*i}$
      [have.1sg five   years   [*na* him see]$_i$]$_k$ but   the Maria NEG   it $_{k /*i}$
      kseri.
      knows
      Rough paraphrase: 'The last time I saw him was five years ago, but Maria does not know it.' ('It' = that I haven't seen him since; NOT that I saw him)

We derive the same conclusion that we are not dealing with a specific event description from the fact that reference to the event description with a DP like 'this experience' is not possible either:

(63) Echo   pende   chronia   [na ton dho]$_i$.
      have.1sg five   years   [*na* him see]

      [Aftin tin embiria] *$_i$ then   tha   tin   ksechaso   pote.
      [this the experience]   NEG   FUT   it   forget   never
      Rough paraphrase of attempted (but unavailable) reading: 'The last time I saw him was five years ago. I will never forget this experience.'

On the other hand, in the Greek equivalent of the *since*-construction (and the English *since*-construction as well, as indicated in the translation), reference to the event is perfectly possible:

(64) Echi pende chronia [pu ton sinandisa]$_i$.
      has   five   years   [*pu* him met]$_i$

      [Aftin tin embiria]$_i$ then   tha   tin   ksechaso   pote.
      [this the experience]$_i$ NEG   FUT   it   forget   never
      'It has been five years since I met him. I will never forget that experience.'

In short, the *na*-construction does not contain a specific indefinite description of the event. But neither can it contain a non-specific indefinite event description, because the prediction, in this case, would again be that (59b) would be true in the context of (59a).[21]

The next option to consider is that it contains a free choice (FC) indefinite. This was proposed for *na*-clauses inside relative clauses in Beghelli (1998).[22] For concreteness and convenience, I will follow a certain practice and assume that FC indefinites are wide-scope universal quantifiers, augmented by whatever properties distinguish FC items from other universal quantifiers. See Vendler (1962) and many works since then. I will not go into all that FC adds to the universal force.[23]

At this point, I would like to draw a parallel between the *na*-construction and a close topological analogue. Consider the "gas station sentence."[24]

(65) We are five miles from a gas station.

I will be using the gas station sentence as a tool with which to probe the *na*-construction throughout a significant part of this paper, though we will see in Sect. 6 that the two are not equivalent after all.

The indefinite *a gas station* can be interpreted specifically:

(66) There is a gas station that we are five miles away from.

On this reading, (65) would be true regardless of there being other gas stations closer by. All that would be necessary for its truth is that there be one gas station five miles from where we are. As predicted, on this reading, pronominal reference to this gas station is possible:

(67) We are five miles from a gas station, but it is a very expensive one.

But the specific interpretation of *a gas station* is not the reading of (65) that is of interest to us, as we have already seen that the *na*-construction does not contain a specific indefinite description. The reading of (65) that is of interest is the one in (68)–(69):

---

[21] That is, (1) cannot mean *Three years ago there was an event of my seeing Manos*.

[22] This is not to say that *all na*-clauses are necessarily free choice items. There are different types of *na*-clauses, as I already said, and the cases would have to be looked at individually.

[23] Neither will I go into the question of whether Greek FC items are more like English FC *any* or the English FC *wh (+ever)* paradigm.

[24] The gas station sentence was suggested to me by Irene Heim (p.c.) as a possible standard of comparison for the *na*-construction in 2003, when I first started thinking about these facts. The comparison is also made in Iatridou (2006). However, the original source of the gas station may well be lost in the mists of time. It is discussed in Mador-Haim and Winter (2012), according to which the gas station sentence was first pointed out to them by Louise McNally (p.c.).

(68) a. We are five miles from *any* gas station.
      b. = the closest gas station is (at least)[25] five miles away
      c. = we are at the epicenter of a (at least) five mile radius circle
           which is empty of gas stations

(69) a. We are (at least) five miles from every+FC gas station.
      b. Every+FC gas station is such that we are (at least) five miles from it.

So the reading of the gas station sentence that is relevant for us is the one where we utter (65) to emphasize the absence of a gas station in a certain area, rather than the presence of a gas station at a certain distance. It is in this sense that the gas station sentence is a close (but as we will see, not identical) parallel to the *na*-construction.

Recall the *na*-construction:

(1) Echo   tria   chronia   na   dho   ton   Mano.
     have.1sg   three   years   *na* see.1sg   the.ACC   Manos.ACC
     Rough paraphrase: 'The last time I saw Manos was three years ago.'

Now we can express (1) along the lines of (65):

(70) Every+FC event of my seeing Manos is such that we are three years from it.

In addition, we also derive the entailments of the empty (temporal) space in the same way: (69b) entails that we are (at least) five miles from the *closest* gas station, and (70) entails that we are three years form the *closest* event of my seeing Manos.

This is very different from how we derived the emptiness of the PTS in the *since*-construction. There we had a time span free of events when there was a unique event description, which named the LB of the time span we were measuring. If there is a unique event, per force, the time span has no other events of this sort in it. In the *na*-construction the emptiness is derived by entailment from an assertion about every+FC relevant event.

The conclusion that the *na*-construction contains a quantificational description also captures the fact that there cannot be any reference to the event in the *na*-clause in (63). The c-command requirement between the quantifier and the pronoun is not met. Similarly, a definite description cannot refer back to a quantificational element in (64). Also similarly, on the specific interpretation of the indefinite in the gas station sentence, pronominal reference is permitted, as we saw in (67), but on the reading that interests us, namely (68)–(69), it is not:

(71) * We are five miles from a(ny) gas station but it is a very expensive one.

---

[25] In (68)–(69), I have made explicit the presence of *at least* in front of the numeral, to remind the reader that that is the interpretation of an unmodified numeral. The presence of *exactly five* is possible, but then all the gas stations must be on the circumference of the circle.

The hypothesis that we are entertaining for the *na*-construction raises a number of issues, of course. We will come to some of those in a later section but for now I would like to address two questions.

The first question regards the existential presupposition of the event. Can we have FC items with an existential presupposition? In Greek the relevant reading of the gas station sentence translates most naturally with an unambiguously FC item (see footnote 23):

(72) Imaste makria apo   opiodhipote venzinadhiko.
      be-1.PLU far   from whichever   gas station
      'We are far from any gas station.'

(Sentence (72) is also relevant for the question of whether *any* in the English gas station sentence is an NPI. In Greek and Italian at least, it is not.[26])

This FC item has an existential presupposition:

(73) There are no unicorns…
      a. … # (Therefore,) we are five miles from any unicorn.
      b. … # Eimaste pende milia apo   opiondhipote monokero.
             we are   five   miles from FC   unicorn

So there is no way of avoiding the conclusion that *sometimes* FC items have existential presuppositions.

The other question regards the free choice nature of the quantificational element on the event description. We saw that it cannot be a specific or non-specific indefinite and found some reasons to follow Beghelli's (1998) idea of a FC item in a relative clause containing a *na*-clause. If a FC item is like a wide scope universal quantifier, then the question arises how we know it is a FC item at all? That is, what if what we are dealing with is a plain universal quantifier? I should say that if this turns out to be the case, from one point of view, the net effect for the current discussion may be small, in that we would still be dealing with a determiner meaning on an event description. However, there are several reasons why a free choice universal may be the better choice. First of all, for the data that Beghelli (1998) is looking at, it is clear that a plain universal quantifier won't do:

(74) Psachno   enan yatro pu   na dichni   katanoisi.
      search.1.SG one doctor REL *na* show.3SG understanding
      'I am looking for a doctor who shows understanding.'

The interpretation of (74) is that I am looking for any doctor who has this property, not for every doctor. So, if *na*-clauses provide a FC universal somewhere, the default assumption is that when it appears with a universal meaning again, it would be the same

---

[26] Thanks to Andrea Moro, p.c.:

(i) Siamo   lontani da qualsiasi ristorante.
     be.1.PLU from   of FC   restaurant
     'We are far from any restaurant.'

type of universal. Second, if we take the analogy between the *na*-construction and the gas station sentence seriously (though we will see that there are points of divergence), then we should also take seriously the fact that (72) contains a FC item, not the plain universal. The gas station sentence is possible with a plain universal in both Greek and English, but in such a case the meaning is different. Compare (75) and (76):

(75) a. We are five miles from any gas station.
     b. We are far from any gas station.

(76) a. We are five miles from every gas station.
     b. We are far from every gas station.

For (75), the speaker needs to know that a certain area is empty of gas stations. One can reach this knowledge by knowing where all the gas stations are, of course, but one can also reach it by having perused an area and have found it empty of gas stations. On the other hand, for (76), the speaker needs to know what gas stations there are and where they are. This is brought out in the following context, where only *any* is felicitous:

(77) a. I don't know where exactly all the gas stations are, nor how many
        there are, but
     b.   …we are far away/at least five miles away from any station.
     c. # … we are far away/at least five miles away from every gas station.

The Greek gas station sentence in (72) definitely behaves like (75). Finally, the contrast between (77b) and (77c) also helps decide against treating the quantificational element in the *na*-construction as a plain universal and in favor of treating it as a FC item:

(78) a. Then ksero poses fores ton echi dhi ke pote akrivos ton idhe…
        NEG know.1.SG how-many times him have.3.SG seen and when exactly him
        saw
        'I don't know how many times she has seen him and when exactly she saw
        him…
     b. ala tora [echi   tria   chronia na ton dhi]
        but now [have.3SG three   years   *na* him see]

The bracketed *na*-construction in (78b) is perfectly acceptable in a context similar to (77a). So again, if we take the parallel with the gas station sentence seriously, this would be another argument that the *na*-construction contains a FC item and not a plain universal.

7 More on the syntax of the *na*-construction

In this section, we will delve deeper into the make-up of the *na*-construction. I have argued that in the *since*-construction, the temporal constituent is a measure phrase. It measures how much time fits in the time span between the LB event and the RB. It is correctly predicted, therefore, that there is a definiteness restriction on it:

(79) It has been one month since his cat died.

(80) * It has been (the month of) June since his cat died.[27]

The same definiteness restriction holds in the *na*-construction:

(81) * Echo   ton Iounio na dho   ton   Mano.
          have.1sg the June   *na* see.1sg the.ACC Manos.ACC

It is quite natural to assume that the temporal constituent in the *na*-construction plays exactly the same role as in the *since*-construction. After all, this would fit the larger pattern of similarities between the two that we have seen. However, there are good reasons to believe that the temporal constituent plays a very different role in the two cases, and this difference will unavoidably point to a very different syntax for the two constructions.

The English *since*-construction can contain a temporal adverbial like *three years,* but it cannot itself contain a *since*-adverbial, or else it would end up looking like (82) below. Given the proposed analysis of the *since*-constriction, the unacceptability of (82) is fully expected.

(82) *It has been since 1990 since his cat died.

What about the *na*-construction? It turns out that the *na*-construction differs in this regard, because it can in fact, accommodate *since*-adverbials, as illustrated in (83b,c).

(83) Echo   na   ton dho…
          have.1sg *na* him see
      a. pende   chronia.
          five   years
      b. apo   to   1991.
          from   the   1991
          'since 1991.'
      c. apo   tote pu   fagame   mazi.
          from   then REL[28] ate.1pl   together
          'since we ate together.'

Even though we have seen that the "rough" paraphrases provided in the beginning of this paper are *too* rough, the sentences in (83) can be seen as containing the following as parts of their meaning:

---

[27] But as Sergei Tatevosov (p.c.) points out, it is possible to coerce such DPs into indefinite measure phrases:

(i) It has been three Januaries since his cat died.

[28] By "REL", I mean a relative clause marker. Whether it can be reduced to other uses of *pu* I leave open for now. See Appendix 2.

(84) a. The last time I saw him was five years ago.
      b. The last time I saw him was in 1991.
      c. The last time I saw him was when we ate together.

The adverbial *apo (tote pu)* (literally "from (then [Relative clause])") is a LB-adverbial in Greek:

(85) Echo pai   thio fores stin   Thessaloniki **apo** **to** **1991.**
      have gone two times to-the Thessaloniki from the 1991
      'I have gone to Thessaloniki two times since 1991.'

(86) Echo pai   thio fores stin   Thessaloniki **apo** **tote** **pu**
      have gone two times to-the Thessaloniki since then REL
      fagame   **mazi.**
      eat.Pst.2PLU together
      'I have gone to Thessaloniki two times since we ate together.'

But now we have a problem. In the *since*-construction, the LB of the time span is the event in the *since*-clause.

(87) It has been three years <u>since I saw Manos.</u>

(88) Event$_{\text{I see Manos}}$ UT
      |…………….3 years…………………………....|

But what about in the *na*-construction? For (1) and (83a), (88) seems basically right. That is, one would expect that the underlined event description in (1) plays the same role in (88) as the underlined event description in (87) does, namely to set LB:

(1) Echo   <u>na dho   ton</u>   Mano   tria   chronia.
     have.1sg *na* see.1sg the.ACC Manos.ACC three years

But if that is the case, then what about (83b,c)? That is, if (88) is correct for (1) and (83a) and the event in the *na*-clause names the LB, then the same should hold for (83b,c). But then what does the boxed LB-adverbial do? Do we have two constituents setting LB?

(83) b. Echo   <u>na   ton   dho</u>   apo to 1991
        have.1sg *na* him   see   from the 1991

      c. Echo   <u>na   ton   dho</u>   apo tote pu fagame mazi
        have.1sg *na*   him   see   from   then REL ate.1pl together

We must conclude that the phrase *three years* in the *since*-construction does not have the same syntactic or semantic role as in the *na*-construction. In the *since-*

construction *three years* is a measure adverbial. In the *na*-construction it can be replaced by an explicit LB-adverbial.

So what is the role of the temporal constituent in the *na*-construction? In order to answer this question, we have to find out what *tria chronia* ('three years') and *apo(tote pu)* ('since…') have in common in Greek. That is, we need to find out what adverbial class they *both* belong to. The answer to this question is that both are LB-adverbials in the "Universal Perfect" (U-Perfect).

Let me remind the reader what a U-Perfect is. Recall what we said earlier about the Perfect:

(14) I have visited Cape Cod three times since 1990.

(15) a.   There is a time span (the Perfect Time Span/PTS);
      b.   the Right Boundary of the PTS is the time of utterance;
      c.   the Left Boundary of the PTS is (some time in) 1990;
      d.   in the PTS <u>there are three subintervals</u> at which it is true that I visit Cape Cod.
      e. $\exists t : RB(NOW, t)$ and $LB (1990, t)$ and $\exists t', t'', t''' : $ I visit Cape Cod at t', t'', t'''

   f.
```
   1990                                                          UT
   LB              ✔                ✔                ✔           RB
    |...............................................................|
                              (PTS)
```

Sentence (14) is an example of an "existential" Perfect (E-Perfect) because there is existential quantification over subintervals in the PTS.

There can also be universal quantification over subintervals of the PTS. Then we have a "universal" Perfect. That is, the difference between (15) and (90) is in the underlined parts in (15d) and (90d), and it is also reflected in (15e) and (90e):

(89) I have been in Los Angeles since Tuesday.

(90) a.   There is a time span (the Perfect Time Span/PTS);
      b.   the Right Boundary of the PTS is the time of utterance;
      c.   the Left Boundary of the PTS is (some time in) Tuesday;
      d.   <u>for every subinterval</u> of the PTS it is true that I am in LA.
      e. $\exists t : RB(NOW, t)$ and $LB (1990, t)$ and $\underline{\forall t' \subseteq t} : $ I visit Cape Cod at t'

   f.
```
   Tuesday                                          UT
   LB                                               RB
    ^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^
    |...................................................|
                      (PTS)
```

Certain adverbials can appear with both the E-Perfect and the U-Perfect. One such example are LB-adverbials introduced by *since*. Other adverbials can appear only in the U-Perfect, for example, the LB-adverbials *ever since*, *at least since*. An adverbial introduced by *for* (e.g. *for five years*) can be part of a E-Perfect or a U-

Perfect when it is in sentence-final position, but in sentence-initial position it can only be an LB-adverbial and form a U-Perfect (Dowty 1979; Iatridou et al. 2001).

(91) a. For five days I have been in sick in bed.

   b.
```
LB                                              RB/ UT
^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^

|………………………………………….....................|
              (PTS)          five days
```

In other words, *for five days* can be an LB-adverbial. It sets the LB five days before the RB. But it can only do this in the U-Perfect.

Now, it so happens that in Greek the string *tria chronia* ('three years') is actually ambiguous between a measure phrase and an LB-adverbial. That is, it appears where English would have the simple measure phrase *three years*, as well as where English would have the LB-adverbial *for three years*.[29]

(92) Measure uses:
   a. To   pedhi   ine   <u>tria   chronon.</u>
      the   child   is   <u>three   years.GEN</u>
      'The child is <u>three years</u> old.'
   b. Efige   prin   <u>tria   chronia.</u>
      left   before   <u>three   years</u>
      'S/he left <u>three years</u> ago.'

(93) LB-adverbial uses:
   a. Ksero   ton   Kosta   <u>tria   chronia.</u>
      know.1sg   the   Kosta   <u>three   years</u>
      'I have known Kosta <u>for three years.</u>'

   b. Ine   arostos   <u>ena   chrono.</u>
      is   sick   <u>one   year</u>
      'He has been sick <u>for one year.</u>'

   c. Spudazi   violoyia   <u>dhio   chronia.</u>
      studies   biology   <u>two   years</u>
      'S/he has been studying biology <u>for two years.</u>'

To summarize where we are: We set out to find what *tria chronia* ('three years') and *apo(tote pu)* ('since…') have in common in Greek, since both adverbials appear

---

[29] There is an adverbial *epi dheka chronia* ('during ten years'), but it is a VP-level adverbial only, not a PTS adverbial. There is also an adverbial *ya dheka chronia* ('for ten years'), which similarly seems to go with an imperfective eventuality only. This is also the adverb that goes with intentions:

(i) Irtha   ya   dheka   meres   ala   emina   ikosi.
   came.1sg   for   ten   days   but   stayed.1sg   twenty
   'I came with the intention of staying ten days but stayed twenty.'

in the *na*-construction, as shown in (85). What we have found is that they are both LB-adverbials for the U-Perfect. Therefore, we should think of the *na*-construction as a U-Perfect.[30]

Before going further into the nature of the *na*-construction as a U-Perfect, I would like to address a possible concern. The reader will have noticed that there is no Perfect morphosyntax in (93a–c), yet I called it a 'U-Perfect'. In quite a few languages (Greek among them), the morphosyntax of the Perfect (Auxiliary + participle) cannot express the U-Perfect (see Iatridou et al. 2001). Instead, this is done by tenses in the Imperfective. That is, the Present U-Perfect is expressed by the Present Imperfective, the Past U-Perfect (*I had been studying for two hours*) by the Past Imperfective, and the Future U-Perfect (*I will have been studying for two hours*) by the Future Imperfective. So when I say here 'U-Perfect', I use the term as a semantic label for universal quantification over subintervals of a time span, and not as the name of a syntactic construction.[31]

So from the vantage point of the *na*-construction being a U-Perfect, the following two sentences have a similar structure:

(94) Ksero   ton Kosta [pende chronia / apo   to   1990].
     know.1sg the Kostas [five   years   / from the 1990]
     'I have known Kosta for five years/ since 1990.'

(95) Echo   na dho ton Mano [pende chronia/ apo   to   1990].
     have.1sg *na* see ton Manos [five   years/   from the 1990]

In both (94) and (95), the bracketed adverbials set the LB of the PTS, while the RB is set by Tense (at UT, since both are Present Tense). And in both, the rest of the sentence, namely, the underlined parts, provides the predicate that is asserted to hold at every subinterval of the PTS. So for the two expansions of (94), we get (96a,b):

---

[30] This explains why the LB-adverbial is obligatory, as the U-Perfect is possible only with overt adverbials, unlike the E-Perfect (see Iatridou et al. 2001).

[31] The English imperfective cannot convey the U-Perfect meaning. Rather, Perfect morphosyntax must be used:

(i) *I am reading this book since Tuesday.

(ii) I have been reading this book since Tuesday.

 The fact that we understand why the Perfect morphosyntax in Greek cannot yield a U-Perfect reading does not entail that we understand why the Imperfective tenses should be able to. Nor is it necessary that a language can express the U-Perfect meaning in only one of the two ways. For example, Bulgarian can form the U-Perfect both with the Perfect morphosyntax and with the Imperfective tenses.

What is the difference between languages like Greek and Bulgarian, on the one hand, and languages like English, on the other, so that the imperfective tenses of the former, but not of the latter, can yield the U-Perfect? There are at least two possible paths to a solution. One could hypothesize that the meaning of the simple (i.e. non-Perfect) imperfective tenses is different in the two types of languages. Alternatively, one could imagine that a formal annotation for the Perfect is present (for example, the relevant functional projection) even in the Greek U-Perfect, but that for some reason it cannot (or need not) be spelled out with the aid of an auxiliary, that is, with Perfect morphosyntax.

(96) a.   LB   I know Kostas   RB/UT
           ^^^
           |..|
                              five years   (PTS)

      b.   LB/1990   I know Kostas   RB/UT
           ^^
           |...|
                                        (PTS)

Similarly, for the two expansions of (95), we get (97a,b):

(97) a.   LB   ??????   RB/UT
           ^^
           |...|
                              five years   (PTS)

      b.   LB/1990   ??????   RB/UT
           ^^
           |...|
                                        (PTS)

But what we do not yet know is what predicate holds throughout the PTS. That is, what is the equivalent to 'I know Kostas' in (96)? The obvious answer should be the underlined part in (95), namely, *echo na do ton Mano*. The problem is that it is not obvious what this predicate means. Outside of the *na*-construction (that is, without the LB-adverbial) it means something completely different, as we saw in (8), repeated below:

(8) Echo   na dho   ton   Mano.
     have.1sg.Prs *na* see.1sg the.ACC Manos.ACC
     'I have to / am supposed to see Manos.'

Let us look in more detail into the matrix predicate of the *na*-construction. It contains the verb *ech+* ('have'), which is a verb of possession as well as the verb used in the existential construction.[32] (See Freeze 1992 for the suggestion that possessive sentences should be reduced to existential constructions.)

---

[32] One might think that BE is (also) an existential verb in Greek (it can appear in (98) instead of HAVE). However, I suspect that HAVE is the "true" existential verb and BE provides a type of locative construction. For one, only HAVE can appear in existential sentences with mass nouns:

(i)   Echi alati sto   trapezi?
      has   salt   on-the   table
      'Is there salt on the table?'

(ii) *Ine alati sto   trapezi?
       is   salt   on-the   table

(98) <u>Echi</u>   [pende   karekles]   [sto dhomatio].
      have.3sg [five   chairs]   [in the room]
      'There are five chairs in the room.'

As a non-thematic verb, it is a good candidate for A-movement. In fact, the *na*-construction passes certain classic tests for Raising (as opposed to Control). For example, it can take an expletive subject:

(99) Echi 50 chronia [na anakinothi oti   metampsichothike enas Lama].
      has 50 years   [*na* be announced that was-reincarnated   a   Lama]

      Rough paraphrase:
      'The last time there was an announcement that a Lama has been reincarnated
      was 50 years ago.'
      Or, along the lines of (70):
      'Every + FC event of an announcement of a Lama having been reincarnated
      is such that we are 50 years from it.'

Another argument in favor of Raising in the *na*-construction is that Control constructions typically[33] have as an entailment the matrix verb predicated of the subject, while Raising constructions do not:

(100) a. He persuaded Bill PRO to leave $\Rightarrow$ He persuaded Bill
       b. He promised Bill PRO to leave $\Rightarrow$ He promised Bill
       c. He tried PRO to leave $\Rightarrow$ He tried

(101) a. He$_k$ is certain t$_k$ to leave $=/\Rightarrow$ He is certain
       b. He$_k$ is likely t$_k$ to leave $=/\Rightarrow$ He is likely
       c. He$_k$ is expected t$_k$ to leave $=/\Rightarrow$ He is expected

In the *na*-construction the entailment does not go through, showing that it patterns with Raising, not with Control:

(102) Echo   pende chronia na ton dho $=/\Rightarrow$ Echo (pende chronia)
       have.1sg five years   *na* him see $=/\Rightarrow$ I have (five years)

In short, in the *na*-construction there is an existential predicate that contains A-movement:

---

[33] A possible counterexample might be modals, if those are Raising predicates (Bhatt 1998; Wurmbrand 1999):

(i) He$_k$ must t$_k$ leave $\Rightarrow$ He must

However, I can't think of counterexamples the other way; this possibly means that we are not dealing with a biconditional. That is, in Control the entailment always does go through, but in Raising it sometimes does and sometimes doesn't. Since the entailment does not go through in the *na*-construction, we would still diagnose it as Raising.

(103) [ego_i   echo   [t_i   na dho ton Mano]   [pende chronia/ apo   to
      [I_i   have.1sg [t_i *na* see   the Manos] [five   years/   from the
      1990]]
      1990]]

(104)
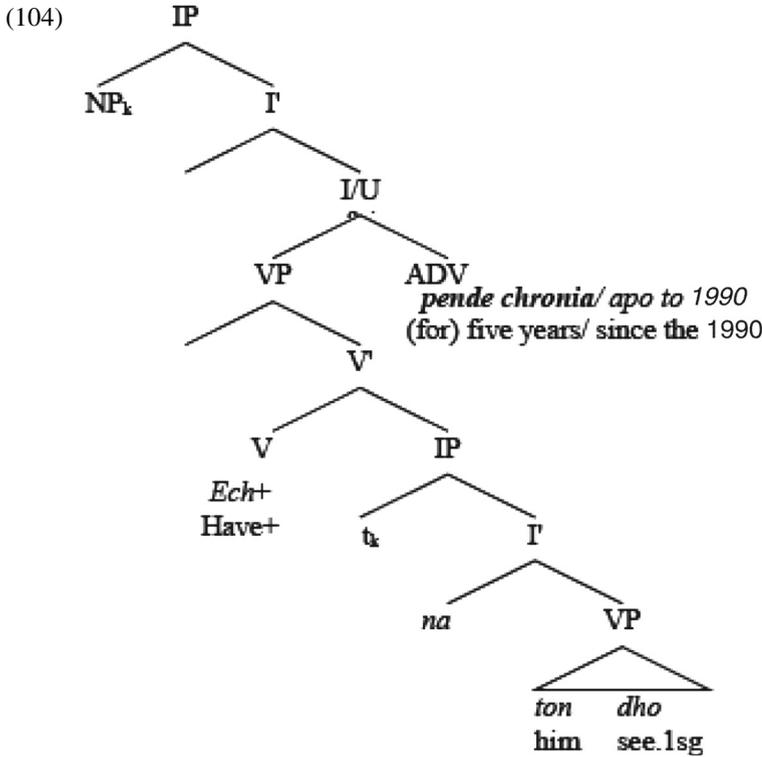
In other words, what we have ascertained so far is that (a) the *na*-construction is a U-Perfect, (b) the LB and RB of the PTS are set up as usual (i.e., the LB by an adverbial and RB by Tense), and (c) the predicate that holds at all the subintervals of the time span is an existential one. But what we still do not know is what it is that is asserted to exist throughout the PTS.

I propose the following meaning for the *na*-construction as a whole:

(105) *The meaning of the na-construction:*
      a. For every point t in the Perfect Time Span there exists a time span
          between t and any$_{FC}$ event of the type described in the *na*-clause.
      b. $\forall t$ (t∈PTS $\rightarrow$ ($\forall_{FC}$ e (*na*-clause (e) $\rightarrow$ $\exists$ i (i$\neq\varnothing$) between e and t))

This means that the predicate that is asserted to hold throughout the PTS is the following:

(106) *The Predicate of the na-construction:*
  P = ∃ interval between any$_{FC}$ event of the *na*-clause type and t

It should be clear that (105) and (106) together guarantee that the PTS will be empty of events of the kind in the *na*-clause. This is because in combination, they yield the effect that every point t will be at a non-null distance from any event of the relevant sort.

Imagine that there is an event of the relevant sort at t in (108). This situation would falsify (105)–(106) because there would be a time point which is not at a non-null distance from an event of type e.

(107) LB$_{PTS}$ RB$_{PTS}$
  |…………………………t…………………………..|

In short, (105)–(106) derive the meaning of the *na*-construction as asserting that at every subinterval of the PTS, we are at a distance from any event of my seeing Manos. In this way, then, (105)–(106) give us the basic ingredients of the meaning of the *na*-construction.[34]

Before closing this section, I would like to revisit the comparison between the *na*-construction and the gas station sentence, a metaphor that I used for explanatory purposes. We saw that there were some similarities, but there are also two important differences that should make us conclude that the two are not equivalent.

The first difference revolves around the data in (83), repeated below, namely the fact that in the *na*-construction, one does not just have the choice of a measure phrase, but also of an LB-adverbial.

(83) Echo   na   ton   dho…
    have.1sg *na*   him   see
    a.   …pende chronia.
              five   years
    b.   …apo   to   1991.
              from   the   1991
              'since 1991.'

This is not the case for the gas station sentence, where only a measure phrase can occur. It stretches the imagination a bit to come up with the gas station analogue of

---

[34] RB$_{PTS}$ is a variable set by matrix Tense, just as in any Perfect. LB$_{PTS}$ is set by the LB-adverbial. We can also view (106) as asserting the existence of an additional time span, bounded by LB$_{emb}$ and RB$_{emb}$, where 'emb' stands for "embedded". RB$_{emb}$ is a temporal variable, just like the other RBs we have been looking at. The meaning in (106) would ensure that RB$_{emb}$ covaries with time points of the matrix time span, universal quantification over which yields the U-Tense/Perfect reading. As for LB$_{emb}$, it is the event description (or associated interval) provided by the *na*-clause of the *na*-construction (which contained the FC description, as we saw). In other words, (105) is effectively (i):

(i) For every point t in the time span between LB$_{PTS}$ and RB$_{PTS}$ there exists a time span$_{emb}$ between LB$_{emb}$ and t.

(83b); the best I can do is (109), where the attempted interpretation is that the closest gas station is in New York.

(108) We are five miles away from a gas station.

(109) *We are from New York from a gas station.

The second difference between the *na*-construction and the gas station sentence can be seen when we modify the measure phrase with *exactly* (keeping again to the non-specific interpretation of the indefinite in the gas station sentence):

(110) We are exactly five miles from any gas station.

(111) Echo   akrivos pende chrona na dho ton Mano.
        have.1SG exactly five   years *na* see the Manos

The sentence in (110) would be true if we are at the epicenter of a circle whose radius is exactly five miles, on the perimeter of which are all the gas stations. As to (111), if the gas station sentence were the topological equivalent of the *na*-construction, then this sentence could not be true if there were more than one event of my seeing Manos. What would it mean to be five years from every$_{FC}$ event of seeing Manos, if there is more than one such event? Under the analysis of the *na*-construction in (105)–(106) this issue does not arise. The measure phrase *akrivos pende chronia* ('exactly five years') is an LB-adverbial. As such it specifies the size of the PTS throughout which the predicate holds. The measure phrase does NOT specify the distance from the event described (as is the case in the *since-/pu*-construction). Therefore, we do not run into the situation whereby we would be saying that I am exactly five years from every$_{FC}$ event of seeing Manos. But this means that the *na*-construction (and the meaning given in (105)–(106)) is not equivalent to the gas station sentence. While analyzing the latter in detail is not within the scope of the current paper, it seems that the gas station sentence shares something with both the *na*-construction and the *since*-construction: with the former it shares the free choice indefinite interpretation, while with the latter it shares the fact that the (indefinite) gas station and the event description name the (Left) Boundary of an interval, which results in the fact that only a measure phrase is permissible.

8 Conclusion, shortcomings, and future challenges

This paper should be read against the backdrop of three lines of linguistic investigation:

- the investigation of the Perfect construction, which has received considerable attention, going back to Reichenbach (1947);
- the working hypothesis that certain constructions can be captured in terms of the semantics of determiners on nominal expressions, with which we are more familiar; we saw a case of a definite description and a free choice description;

– the common observation that we talk about time the way we talk about space.

The focus of the paper was a particular construction in Greek, which I called the '*na*-construction'. Along the way of exploring this construction, we compared it to the negated Perfect, as well as to the *since*-construction. The hope is that in the process we learned something about all three.

While the proposal in (105)–(106) goes a fair way towards capturing the *na*-construction, there is still work to be done. I address two shortcomings in the rest of this section, one apparent, one real.

I argued that there is Raising in the *na*-construction because the higher verb is not thematic and because there is subject agreement (the position of the overt subject does not say a lot, as Greek permits a number of word order permutations). Therefore, I indicated the position of the trace of the moved subject inside the subject position of the *na*-clause, as in (104). However, there is one datum that remains unaccounted for. In the *since*-construction (and its Greek equivalent) there is no connection between the tense on the verb and the life-span of the subject of the *since*-clause. For example, the tense on the Perfect can be Present even if the subject of the *since*-clause is no longer alive:

(112) It has been 60 years since Ventris, Kober, and Chadwick deciphered
       Linear B, but we still don't understand Linear A.

This is exactly as expected, given what we have said about the *since*-construction.

In the *na*-construction, however, if the (raised) subject is no longer alive, the sentence is unacceptable. It does not seem false, though; most likely it is infelicitous:

(113) #O Napoleon echi   200 chronia na pai sto   Parisi.
       the Napoleon have.3SG 200 years   *na* go to the Paris

The status of (113) does not follow from the Raising shown in (104). At the outset of this paper I gave what I called a "rough paraphrase" for the *na*-construction; here is one more place where that paraphrase fails, as (114) does not suffer the same fate as (113):

(114) The last time Napoleon went to Paris was 200 years ago.

In short, it appears that if the *na*-construction is in the Present Tense, the subject must be alive at UT. If the subject were thematic—for example, the subject of an agentive verb—one would expect the effect of the Present Tense to be exactly this. But in the case of a derived subject, it is unclear where the restriction would come from.[35] However, this formulation of the problem is only apparent.

---

[35] For example, there is nothing wrong with (i), because *Napoleon* is the derived subject of *seems*:

(i) Napoleon seems to have been the last French emperor.

Recall from (48) that the *na*-construction cannot be used with events that are known to be unique in nature:

(48) *#[i gata tu]   echi   pende   chronia   na   pethani.
         [the cat his]   has   five   years   *na*   die
         Rough paraphrase: 'The last time his cat died was three years ago.'

On the other hand, the *na*-construction is fine when the event in the *na*-clause has happened only once. In other words, the restriction is only against events that are unique by nature—that is, events that can happen only once. There is no problem with events that coincidentally happened only once. Even presuming that I have been to Pompeii only once, I can still say (115):

(115) Echo   pende   chronia   na   pao   stin   Pompia.
          have.1SG   5   years   *na*   go   to-the   Pompeii
          Rough paraphrase: 'The last time I went to Pompeii was five years ago.'

What makes (115) fine is that the event is in principle repeatable: I can still go to Pompeii another time. From this perspective, what is wrong with (113) is not that we are using the Present Tense on a subject who is dead. Sentence (113) is unacceptable because it conveys that it is still possible for Napoleon to go to Paris. In other words, the event has to be in principle repeatable; if the agent of the event description is dead, the event is not repeatable.

That this is indeed the correct formulation can be seen from the fact that the *na*-construction is equally unacceptable when it is the object of the event description who is dead, even if the subject is still alive. For example, given that Marcel Marceau is no longer alive, I cannot see him perform again and it is therefore correctly predicted that (116) is unacceptable (though recall that this is not apparent in the rough paraphrase):

(116) #Echo   dheka   chronia   na   dho   ton   Marcel Marceau.
           have.1SG   10   years   *na*   see   the   Marcel Marceau
           Rough paraphrase: 'The last time I saw Marcel Marceau was ten years ago.'

In other words, the problem with (113) does not lie with the Present Tense and the deceased subject. The problem reduces to the fact that the event is not repeatable.

The second (and very real) shortcoming of this paper is that I am unable to determine for all the bits and pieces of the meaning that I have identified in (105)–(106) how they are anchored in the structure. For example, I argued, first, that the *na*-construction is a Universal Perfect and, second, that the universal quantifier that has the widest scope in (105)–(106) is associated with this U-Perfect, leading us to expect certain behaviors. However, I also argued that a (free choice) universal is associated with the *na*-clause, but with which part of the *na*-clause exactly? It is probably not the *na* itself, as we already saw that this particle appears in other constructions without FC-universal meaning. Similarly, I have not indicated where

the meaning of (105) is anchored to the morphosyntax, beyond pointing out that there is an existential verb in the structure.

There is a lot more to the *na*-construction than the eye can see, as there are certainly a number of covert elements involved. In other words, I have fallen short of providing a complete compositional analysis, but I hope that future research will shed more light on everything that has been discussed here.

In my defense, I should say that this is the case for many form-to-meaning mappings. For some such mappings we are pretty confident. For example, we think we know that the meaning of the Past Tense is associated with the morpheme –*ed* in English. But for others, e.g. the Perfect, even though there is a plethora of ideas about it, there is not much understanding about which morpheme associated with the Perfect—auxiliary or participle—is responsible for which meaning component. Similarly, a lot is said about infinitives receiving a modal interpretation in infinitival questions or relatives. But which part of the infinitive exactly introduces this element is also unknown. This paper, I have to confess, suffers from this same weakness.

Appendix 1

Tsoulas (1994) argues that *na*-clauses are indefinites (though he does not discuss the construction that we have been focusing on), and in a way I am adopting this insight of his. However, the arguments that Tsoulas actually uses do not argue for his conclusion. Tsoulas starts out by pointing out that in French the wh-island is much weaker when the embedded clause is infinitival or subjunctive than when it is indicative.

(117) Indicative:
    a. *Que te demandes-tu [à qui Suzy a donné]?
        What you ask-you [to who Suzy has given]
        'What do you wonder to whom Suzy gave?'
    b. *Que te demandes-tu [qui a dit qu' Alex a vu]?
        what you ask-you [who has said that Alex has seen]
        'What do you wonder who said that Alex saw?'

(118) Infinitive:
    a. À   qui   te   demandes-tu [quoi donner]?
       to   whom you   ask-you   [what to give]
    b. Que te   demandes-tu [à   qui   donner]?
       what you   ask-you   [to   who   to give]
    c. Que te   demandes-tu [qui   a   décidé   voir]?
       what you   ask-you   [who   has   decided to see]

(119) Subjunctive:
    a. Que te   demandes-tu [qui a   voulu   que Sophie voie]?
       what you ask-you   [who has wanted that Sophie see.SUBJ]
    b. Que te   demandes-tu [qui a   exigé   que Sophie écrive]?
       what you ask-you   [who has required that Sophie write.SUBJ]

Tsoulas talks about similar patterns in Greek. Greek has the expected wh-island effect with indicative clauses, but he claims that with *na*-clauses the effect is much weaker:

(120) a. Ti   anarotiese   [se   pion   na dosis]?
        what wonder.2sg [to   who   *na* give]
        'what$_k$ do you wonder to who what to give t_k'
    b. Se   pion   anarotiese   [ti   na dosis]?
        to   whom   wonder.2sg [what   *na* give]
        'to who$_k$ do you wonder what to give t_k'
    c. Ti   anarotithikes [pios   apofasise na di]?
        what wonder.2sg [who   decided   *na* see]
        'what$_k$ did you wonder who decided to see t_k'

In addition, Tsoulas reminds the reader of extraction facts out of DPs: extraction out of definites or specific indefinites is much worse than out of indefinites. This has been noted for English; here are Tsoulas's French examples:

(121) a. De   qui   veux-tu voir une   photo?
        of   who want you see   a/one photo
    b. De   qui   veux-tu voir des   photos?
        of   who want you see   some photos
    c. *De qui   veux-tu voir une   certaine photo?
         of who want you see   a   certain   photo
    d. *De qui   veux-tu voir la   photo?
         of who want you see   the   photo
    e. *De qui   veux-tu voir ces   photos?
         of who want you see   these photos

Tsoulas takes the position that the indicative has a definite feature (which can appear on C or on I), whereas the infinitive and subjunctive have an indefinite feature. Hence the extraction out of indicatives is bad, but extraction out of subjunctives is good. He does not address why indefiniteness is compatible with extraction while definiteness is not.

One problem with Tsoulas's account is the following. He talks about a parallelism in extraction, but of course the parallelism, if there is one, is not between definite DPs/ indicative clauses on the one hand and indefinite DPs/ subjunctives/infinitives on the other. In general, extraction out of indicatives is permitted, whereas extraction out of definite DPs is not permitted. Extraction difficulties with the indicative arise only once we combine the indicative with an island-inducing environment like an embedded question. In other words, the definiteness of the indicative is not in itself sufficient to block extraction; an island is necessary. This means that we cannot argue for a parallelism between indicatives and definites based merely on extraction: definites always block extraction, indicatives block extraction only if there is an island.

Tsoulas's second argument is as follows: There are environments where the indicative, as a definite, causes Definiteness Effect violations, whereas the subjunctive and infinitive do not, which argues, according to Tsoulas, that they are indefinites:

(122) a. Il   faut   que   [Pierre parte/   *part].
           It is necessary that   [Pierre leave.SUBJ/   .*IND]

       b. Il   faut   trouver Sophie.
           It is necessary to find Sophie

       c. Il arrive   que   [Sophie tarde   trop/ *vient   vite].
           It happens that [Sophie is late.SUBJ a lot comes.IND quickly]

Tsoulas does not provide any arguments to the effect that the ungrammatical expansions of the above sentences are ungrammatical because of Definiteness Effect violations. Moreover, his claim cannot be that indicative clauses cannot be coindexed with expletives, as there are plenty that can (though it is unclear to me what Tsoulas's proposal could say about this):

(123) Il semble que Marie est malade.
       It seems   that Marie is   sick.

He discusses only the environments where "…a) [clausal constituents] alternate with DPs and b) the relevant factor governing the distribution of DPs is precisely the Definite vs Indefinite distinction." However, the relevant examples he shows for parallels with DPs are only these:

(124) a. Il arrive [plusieurs personnes].
           'There arrive many people.'
       b. *Il arrive Sophie.

First of all, it is far from clear whether the uses of *arriver* in (122c) and (124a) are alike. As for *falloir* in (122a,b), Tsoulas does not give examples with this verb

taking an NP complement. However, it is in fact the case that *falloir* can take NP complements, and there is no problem with these being definite:

(125) Il me faut ce/un stylo.
       'I need this/one pen.'

As for Greek modal verbs that embed *na*-clauses, he gives only one example (*prepi* 'must'); this verb does not take DP-complements, so we cannot test the parallel with definite DPs. However, if we look at the modal *chriazome* 'need', which can take either *na*-clauses or DP-complements, the parallel is again not supported, as the DP-complement can be definite:

(126) a. Chriazete   na   figume/   * oti fevgume/   (tha)   figume.
          needs.3sg   *NA*   leave.1pl/ that leave.1pl/ (will) leave.1pl
          'It is necessary for us to leave.'
       b. chriazome ena/   afto   to   vivlio.
          I need.1sg a/   this   the   book
          'I need a/this book.'

In other words, we cannot use Tsoulas's second argument to support the parallelism under discussion; for that we only have the parallelism in extraction facts to draw on, with the questions that arose earlier.

To summarize: Tsoulas's discussion of subjunctives and indefinites, and in particular Greek *na*-clauses, does not support his conclusion that *na*-clauses are indefinites, and therefore we cannot rely on it for independent evidence that *na*-clauses can be indefinite descriptions of events.

Appendix 2

In this appendix, I discuss differences and similarities between the English *since*-construction and its Greek equivalent, which I will call the "*pu*-construction".

These are quite alike with respect to the behavior discussed in the main text. However, there are a few differences as well. The first difference involves the licensing of NPIs. The *since*-construction can license them, the *pu*-construction cannot:

(127) It has been five years since I went anywhere.

(128) *Echi pende chronia pu piga   puthena.
        has   five   years   *pu* went   anywhere

Within the theory according to which NPIs are licensed in Downward Entailing Environments (see Fauconnier 1975; Ladusaw 1977), we would have to start by showing that the *since*-construction provides a Downward Entailing (DE) Environment. In order for the *since*-clause to be DE, the truth of (129a) would have to entail the truth of (129b), which it does not:

(129) a. It has been two months since I had (any) dessert.
      b. It has been two months since I had baklava.

However, this environment is a licensor in terms of von Fintel's 'Strawson Downward Entailment': "We can define a notion of entailment that will only check whether an inference is truth-preserving under the assumption that all the conventional implicatures and presuppositions of premises and conclusions are satisfied" (von Fintel 1999, p. 6).

Recall that the *since*-construction has a presupposition that the eventuality in the embedded clause has in fact occurred, as it is built in as its LB. To check whether there is Strawson Entailment, we need to satisfy the presuppositions of the relevant sentences. That is what is done in (130) below. (130a) provides the environment whose Strawson-DE properties we are checking. In our calculations we should assume the truth of (130b) along with that of (130a). Now we can ask the question whether (130c) is entailed; the answer is that it is.

(130) a. It's been five years since I had dessert.
      b. Five years ago I had baklava.
      c. => It's been five years since I had baklava.

So von Fintel provides us with a way to apply the DE theory to capture the licensing of NPIs in the *since*-construction.[36]

The same rationale should apply to the *pu*-construction, but we saw that in that construction NPIs are not licensed. I will not address this question here, other than point in the direction of two possible solutions. On the one hand, one could take the position, following Giannakidou (1997), that Greek NPIs are somewhat different from English NPIs. Alternatively, it might be that the factive complementizer *pu* causes an intervention effect, perhaps along the lines of Linebarger's (1987) Immediate Scope Constraint. Possibly the following data may prove relevant:

(131) a. Nobody thinks that John ate anything.
      b. *Nobody found out that John ate anything.

The second difference between the *since*- and *pu*-constructions involves the matrix verb. In the *since*-construction the matrix verb is BE. In the *pu*-construction, the verb can be either HAVE or BE:[37]

(132) Echi / ine pende chronia pu efige.
      has / is   5   years   *pu* left
      'It has been five years since s/he left.'

---

[36] Von Fintel (1999), who discusses these data and the application of Strawson Entailment to them, attributes them to a paper entitled "Temporal Existentials", which was the manuscript precursor of the current paper and Iatridou (2003).

[37] In contrast, the *na*-construction can only contain HAVE.

As mentioned in the main text, the verbs HAVE and BE can both appear in existential-like sentences. But the choice of verb determines the case of the associate:

(133) a. Ine   pende   astaki   sto psiyio.
           is/are[38]   five   lobsters-NOM   in-the fridge
       b. Echi   pende   astakus   sto psiyio.
           has   five   lobsters-ACC   in-the fridge
           'There are five lobsters in the fridge.'

As can be seen in (133), the two different light verbs behave differently with respect to the choice of Case for the associate: with BE it is Nominative, whereas with HAVE it is Accusative.[39] So far, in order to avoid the question of Case, I have been using examples of measure phrases that are syncretic in the Nominative and Accusative, namely those that are of neuter gender. If we choose measure phrases that do not have this syncretism, we see the difference in Case showing up, just as in (133). If the verb is BE, the measure is in the Nominative. If the verb is HAVE, the measure is in the Accusative:

(134) a. Ine   enas   minas   pu pethane i   gata tu.
           is   one   month-NOM *pu* died   he   cat   his
           'It has been one month since his cat died.'
       b. Echi ena   mina   pu pethane i   gata tu.
           has   one   month-ACC *pu* died   the   cat   his
           'It has been one month since his cat died.'

This naturally raises the question of Case in the *na*-construction. In that construction, the phrase *pende chronia* ('five years') appears in the Accusative. According to the structure that we gave for the *na*-construction in (104), this Accusative cannot possibly be assigned by the matrix verb *echo* ('have'), because we are dealing with an (LB) adverbial, not an argument of the verb. But this is not a problem. Accusative is the Case in which all temporal adverbs appear in Greek. That is, a temporal adjunct appears in the Accusative no matter what the matrix verb is:

(135) a. Perpata   ena   chrono.
           walks   one.ACC   year.Acc
           'S/he has been walking for one year.'
       b. Ine   arostos   ena   chrono.
           is   sick   one.ACC   year.Acc
           'He has been sick for one year.'
       c. Spudhazi   violoyia   ena   chrono.
           studies   biology   one.ACC   year.Acc
           'S/he has been studying biology for one year.'

---

[38] Third person singular and plural of the verb BE are syncretic.

[39] In other words, this existential construction in Greek provides a counterexample to Burzio's Generalization. There is no thematic subject, but we still find the object in the Accusative.

On the other hand, in the *pu*-construction, where the temporal phrase is not an adverb but an argument of the matrix (existential) verb, the Case on the temporal phrase is predicted to depend on the latter, and this is borne out.

These facts support the position that *pende chronia* ('five years') is an adjunct in the *na*-construction but an argument in the *pu*-construction.

The third difference between the *since*- and *pu*-constructions involves the status of the items *since* and *pu*. Unlike English *since*, Greek *pu* by itself is not an LB-adverbial:

(136) a. He has read five books since 1990.
       b. Echi dhiavasi pende vivlia *pu 1990.
           (s/he) has read five books *pu 1990/ *pu (s/he) left
       c. Echi   dhiavasi pende vivlia apo   to   1990.
           (s/he) has read five   books   from the 1990
           'She has read five books since 1990.'

One might be tempted to attribute the difference between (136a) and (136b) to the prepositional status of *since*, which can take DPs in general, as in *since the war*, as opposed to that of *pu*, which is clearly not prepositional and cannot take DP complements, cf. *pu ton polemo* (literally "*pu* the war"). However, we derive the same conclusion when the complement of *pu* is sentential: it simply cannot function as a LB-adverbial outside what we have been calling the *pu*-construction. Compare (137a–c):

(137) a. He has read five books since he left.
       b. *Echi   dhiavasi pende   vivlia   pu   efige.
           (s/he) has read   five   books   *pu* left
           attempted: 'S/he has read five books since s/he left.'
       c. Echi   pende   chronia   pu   efige.
           has   five   years   *pu*   left
           'It has been five years since s/he left.'

If one wants to convey (137a/b), one has to use a full relative clause:

(138) Echi   dhiavasi pende vivlia apo   tote pu   efige.
       (s/he) has read pende books   from then REL (s/he) left
       'S/he has read five books since s/he left.'

Notice, however, that there is a *pu* inside the relative clause; this is a relative clause complementizer/introducer. There are, in fact, a number of *pu*'s in Greek, and it is unclear whether we can unify them. The uses of *pu* reported in the literature are as uninflected relative clause introducer, as shown in (139) (or in (138) above), as interrogative 'where', as in (140), and as factive complementizer (e.g. with emotive verbs), as in (141):[40]

---

[40] We may be dealing with accidental homophonies here. However, see Roussou (2012) for a proposal that all uses of *pu* can receive a unified account.

(139) I   gineka pu   sinandisa chthes   tha   erthi sto   parti.
      the woman REL met   yesterday FUT come to-the party
      'The woman that I met yesterday will come to the party.'

(140) Pu   pige i   Danai?
      Where went the Danai?
      'Where did Danai go?'

(141) Lipame   pu   efige.
      am-sad   C   left
      'I am sad that s/he left.'

The question arises whether *pu* in the *pu*-construction is a fourth use of this item or whether it can be reduced to one of the other ones. If we attempt a reduction, it is obviously not to interrogative *pu* ('where'). The reduction should be either to the relative clause introducer or to the factive complementizer. As a relative clause introducer *pu* can certainly appear in something akin to the *pu*-construction. Compare (137c) with (142):

(142) Echi pende chronia apo   tote pu   efige.
      has five years   from   then REL (s/he) left
      'It has been five years since (the time) she left.'

But this would not suffice to explain the impossibility of plain *pu* as an LB-adverbial for Perfects in general. That is, while (138) and (142) are both fine, only (137c) is good, whereas (137b) is ungrammatical.

It appears, therefore, that analyzing the *pu* of the *pu*-construction as a relative clause introducer does not really buy us much. Moreover, it makes at least one wrong prediction. The relative clause introducer *pu* permits lower readings:

(143) Idha tin   gineka [pu [o   Yanis nomizi [oti   tha   kerdisi
      saw the   woman *pu* [the Yanis believes [that __will win
      ton agona]].
      the race]]
      'I saw the woman who John thinks will win the race.'

Similarly, (24) has both a high and a low reading:

(144) Echi   pende chronia   apo   tote   [pu   [nomizi
      has   five   years   from   then   *pu* believes
      i   Maria [oti   irthe   o   Kostas]]].
      the   Maria that   came   the   Kostas
      'It has been five years since Mary believes that Kostas came.'

On the other hand, as far as I can tell, the *pu*-construction does not permit low readings. Example (145) below says nothing about when Kostas is supposed to have arrived in Maria's beliefs. The five years only refer to how long Maria has had the

described belief (unlike the English translation, which is said to permit both readings for some speakers[41]):

(145) Echi   pende   chronia   [pu   [nomizi   i   Maria.
      has   five   years   *pu*   believes   the   Maria
      [oti   irthe   o   Kostas]]]
      that   came   the   Kostas
      'It has been five years since Mary has been thinking that Kostas came.'

In short, there seems to be no particular reason to believe that the *pu* of the *pu*-construction is a relative clause introducer. This leaves us with the factive complementizer *pu* as the other potential candidate of reduction. As a complementizer, we would not expect it to yield lower readings. Moreover, the factive complementizer *pu* has been described since Christidis (1986) as containing the feature [+definite] (a position also adopted by Roussou 1994; Varlokosta 1994), which would fit very nicely with the findings about the *pu*- (and *since*-) construction in this paper. However, this would still leave unexplained why this type of *pu*-clause can function as LB-adverbial only in the *pu*-construction and not in a Perfect. That is not a contrast peculiar to Greek, though: we find the same phenomenon in Romance. For example, the Spanish equivalent to the *since*- and *pu*-constructions uses the complementizer/relative clause introducer *que*, as can be seen in (146a), but this is not possible in the Perfect, as can be seen in (146b):

(146) a. Hace   cinco   años   (*desde)   que   murió   su   gato.
          makes   five   years   (*from)   that   died   his   cat
          'It has been five years since his cat died.'
      b. He   leído   tres   libros   *(desde) que   murió   su   gato.
          has   read   three   books   *(from)   that   died   his   cat
          'He has read three books since his cat died.'

It is unclear why there is this difference between Greek/Romance and English. In English the morphosytax of the *since*-construction is very much that of the Perfect, but in Greek and Romance there are some morphosyntactic differences between the two, even though the semantics of the meaning of the *pu*-construction (and its Romance equivalent) seems identical to that of the English *since*-construction. I will not pursue this question further here.

---

[41] With the English *since*-construction, I have found conflicting judgments on whether long-distance readings are possible:

(i) %It has been five years since Maria believes that Peter (has) left.

To the extent that (i) can have lower readings, the presence of an operator inside the *since*-clause (as in Geis 1970; Larson 1990; and von Fintel and Iatridou 2005) is supported.

References

Baker, M., and L. Travis. 1997. Mood as verbal definiteness in a tenseless language. *Natural Language Semantics* 5: 213–269.

Beghelli, F. 1998. Mood and the interpretation of indefinites. *The Linguistic Review* 15: 277–300.

Bhatt, R. 1998. Obligation and possession. In *The proceedings of the UPenn/MIT workshop on argument structure and aspect*, Vol. 32, ed. H. Harley, 21–40. Cambridge: MITWPL.

Christidis, A.-Ph. 1986. The morpheme 'pu' as a definite clause nominalizer. *Studies in Greek Linguistics* 7: 134–148.

Dowty, D. 1979. *Word meaning and Montague Grammar*. Dordrecht: Kluwer.

Freeze, R. 1992. Existentials and other locatives. *Language* 68(3): 553–595.

Fauconnier, G. 1975: Polarity and the scale principle. In *Papers from the 11th Meeting of the Chicago Linguistic Society*, pp. 188–199. Chicago: Chicago Linguistic Society.

Frege, G. 1892. Über Sinn und Bedeutung. *Zeitschrift für Philosophie und Philosophische Kritik* 100: 25–50.

Geis, M. 1970. *Adverbial subordinate clauses in English*. Doctoral Dissertation, MIT.

Giannakidou, A. 1997. *The landscape of polarity items*. Groningen Dissertations in Linguistics 18, University of Groningen.

Giannakidou, A. 2009. The dependency of the subjunctive revisited: Temporal semantics and polarity. *Lingua* 119: 1883–1908.

Glasbey, S. 1992. Distinguishing between events and times: Some evidence from the semantics of *then*. *Natural Language Semantics* 1: 285–312.

Groenendijk, J., and M. Stokhof. 1984. *Studies on the semantics of questions and the pragmatics of answers*. PhD dissertation, University of Amsterdam, pp. 1–250: http://dare.uva.nl/document/23983; pp. 251–570: http://dare.uva.nl/document/23984.

Hawkins, J. 1978. *Definiteness and indefiniteness: A study in reference and grammaticality prediction*. London: Croom Helm.

Heim, I. 1991. Artikel und Definitheit. In A. von Stechow & D. Wunderlich (Eds.), *Semantics. An international handbook of contemporary research* (pp. 487–535). Berlin: Mouton de Gruyter.

Iatridou, S. 2003. A little bit more on the English Perfect. In *Perfect explorations*, ed. A. Alexiadou, et al., 133–151. Berlin: Mouton de Gruyter.

Iatridou, S. 2006. A free choice item hidden in verbal morphology. *Glossologia* 17: 11–43.

Iatridou, S., E. Anagnostopoulou, and R. Izvorski. 2001. Observations about the form and meaning of the perfect. In *Ken Hale: A life in language*, ed. M. Kenstowicz, 189–238. Cambridge, MA: MIT Press. (Reprinted from *Perfect explorations*, ed. A. Alexiadou et al., 2003, Berlin: Mouton de Gruyter.)

Iatridou, S., and H. Zeijlstra. 2014. Constant's observation. Manuscript, MIT and University of Amsterdam.

Ladusaw, W. 1977. Some problems with tense in PTW. *Texas Linguistic Forum* 6: 89–102.

Larson, R. 1990. Extraction and multiple selection in PP. *The Linguistic Review* 7: 169–182.

Linebarger, M. 1987. Negative polarity and grammatical representation. *Linguistics and Philosophy* 10: 325–387.

Mador-Haim, S., and Y. Winter. 2012. Locating sets: Spatial semantics of indefinites and collective desciptions. Manuscript, University of Pennsylvania and Utrecht University.

Philippaki-Warburton, I. 1993. The subjunctive mood and the syntactic status of the particle *na* in Modern Greek. *Folia Linguistica* 28(3–4): 297–326.

Philippaki-Warburton, I. 1998. Functional categories and Modern Greek syntax. *The Linguistic Review* 15: 159–186.

Philippaki-Warburton, I., and I. Veloudis. 1984. The subjunctive in complement clauses. *Studies in Greek Linguistics* 5: 87–104.

Portner, P. 1995. Quantification, events and gerunds. In *Quantification in natural language*, ed. E. Bach, et al., 619–659. Dordrecht: Kluwer.

Portner, P. 2011. Perfect and progressive. In *Semantics. An international handbook of natural language meaning*, Vol. 2, ed. C. Maienborn et al., 1217–1261. Berlin: Mouton de Gruyter.

Reichenbach, H. 1947. *Elements of symbolic logic*. New York: Macmillan.

Roussou, A. (1994). *The syntax of complementizers*. PhD Dissertation, University College London.

Roussou, A. (2010). Selecting complementizers. *Lingua, 120*, 582–603.

Roussou, A. 2012. Complements, relatives, and nominal properties. Handout from talk presented at the University of Ghent, March 22, 2012.

Tsoulas, G. 1994. Indefinite clauses: Some notes on the syntax and semantics of subjunctives and indefinites. In *Proceedings of WCCFL 13*, pp. 515–530. Stanford, CA: CSLI Publications.

von Fintel, K. 1999. NPI licensing, Strawson entailment and context dependency. *Journal of Semantics* 16: 97–148.

von Fintel, K., and S. Iatridou. 2005. Since. Manuscript, MIT.

Varlokosta, S. 1994. *Issues in Modern Greek sentential complementation*. PhD dissertation, University of Maryland, College Park.

Vendler, Z. 1962. Each and every, any and all. *Mind* 71(282): 145–160.

Wurmbrand, S. 1999. Modal verbs must be raising verbs. In *WCCFL 18*, pp. 599–612. Somerville, MA: Cascadilla Press.