

Tense and Aspect in English Infinitives

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This article investigates the temporal and aspectual composition of infinitival complementation structures in English. I show that previous classifications of tense in infinitives are insufficient in that they do not cover the entire spectrum of infinitival constructions in English. Using the distribution of nongeneric, nonstative, episodic interpretations as a main characteristic, I show that infinitival constructions fall into three classes: future irrealis infinitives, which allow episodic interpretations with bare VPs; simultaneous infinitives that do not allow episodic interpretations; and simultaneous infinitives that allow episodic interpretations depending on the matrix tense. I argue that the three classes of infinitives are derived from the following properties: future infinitives are tenseless but involve a syntactically present future modal *woll*; simultaneous propositional attitude infinitives impose the NOW of the propositional attitude holder as the reference time of the infinitive; and certain simultaneous infinitives form a single temporal domain with the matrix clause. The analysis proposed has consequences for the composition of tense and aspect, the syntax of infinitives, and the way selection is determined.

Keywords: infinitives, tense, aspect, episodic interpretation, control, exceptional case marking

1 Introduction

Infinitival clauses in constructions such as (1a–b) have traditionally been treated as tenseless complements in English. Since English infinitival complements do not include any overt tense morphology, the lack of such tense morphology was taken as an indication of the lack of syntactic and semantic tense. Starting with Stowell 1982, the conclusion that the lack of tense morphology entails the lack of syntactic/semantic tense has been challenged. A common view since Stowell 1982 is that certain infinitives do involve syntactic/semantic tense, but that this tense is not expressed morphologically in English owing to the lack of nonfinite inflectional affixes. Stowell 1982 was also the first work to suggest that the distribution of tense can be predicted from the semantic properties of the selecting predicate. The basic distinction suggested was that future irrealis infinitives like that in (1a) (i.e., constructions in which the embedding predicate requires that the complement be “unrealized” at the time of the matrix event) are *tensed* infinitives, whereas

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propositional infinitives like that in (1b) (i.e., constructions in which the embedding predicate does not presuppose or assert anything about the embedded event) are *tenseless* infinitives.

- | | |
|---|-----------------|
| (1) a. Leo decided to read a book. | future irrealis |
| b. Leo believes Julia to be a princess. | propositional |

Stowell's semantically based classification of infinitives as tensed versus tenseless has been adopted in many works on infinitives, and a number of syntactic differences have been noted, which were proposed to be related to the presence or absence of (syntactic) tense. Importantly, there are major disagreements among different syntactic approaches about which types of infinitives are to be classified as *tensed* and which as *tenseless*. The main reason for these disagreements, I will show, is that the properties used to diagnose tense in infinitives do not converge on the same classes of infinitives: different tense diagnostics often yield contradictory specifications regarding whether an infinitival construction should count as *tensed* or *tenseless* (section 2 provides a short overview of previous classifications).

The main goal of this article is to characterize the temporal composition of different types of infinitival constructions in English. I start by investigating the temporal properties of future infinitives, which are the showcase of tensed infinitives in most approaches (see section 2). I propose in section 3, contra most approaches, that future infinitives are tenseless; however, they involve a future modal *woll*. In section 4, I turn to infinitives that do not involve a future interpretation and I show that there are two types of nonfuture infinitives. One of the key properties used for dividing infinitival constructions into different classes will be the availability of episodic interpretations with bare (i.e., nonprogressive) verbal predicates (such as *He sang yesterday* vs. **He sings right now*). According to this property (discussed in detail in section 4.1), infinitival constructions fall into three classes (section 4.2): (a) future irrealis infinitives, which allow episodic interpretations with bare VPs; (b) simultaneous infinitives that do not allow episodic interpretations; and (c) simultaneous infinitives that allow episodic interpretations depending on the matrix tense. Considering the temporal properties of the different types of infinitives, I demonstrate that these classes correlate with the following properties: (a) future infinitives are tenseless but involve a syntactically present future modal *woll*; (b) propositional attitude infinitives impose the now of the propositional attitude holder as the reference time of the infinitive (section 4.3); and (c) certain simultaneous infinitives form a single temporal domain with the matrix clause in that their reference time corresponds to the reference time of the matrix predicate (section 4.4). Finally, in section 5, I speculate that the properties of the different types of infinitival constructions are reflected in different syntactic structures, which are determined via local selection by merging a selecting verb with the right type of complement.

2 Tense Diagnostics and Classifications

Following Stowell (1982), a common claim is that tensed versus tenseless infinitives correspond to control versus exceptional case marking (ECM)/raising infinitives, respectively. This view is most clearly expressed in the *null case* approach to control (Chomsky and Lasnik 1993, Bošković 1996, 1997, Martin 1996, 2001). In this approach, infinitival tense is required to license a PRO

subject, whereas an overt infinitival DP subject (such as in ECM infinitives) requires the lack of tense. Proponents of the null case approach (as well as Stowell (1982)) thus claim that (all) control infinitives are future irrealis infinitives, whereas (all) ECM and raising infinitives are propositional infinitives.

Furthermore, the tensed/tenseless distinction has been claimed to be responsible for the distribution of *eventive predicates*—that is, nonstative, nongeneric, episodic interpretations of VP predicates (Pesetsky 1992, Bošković 1996, 1997, Martin 1996, 2001). Following Enç (1991), the authors mentioned assume that eventive predicates contain an event variable that must be bound by a modal or temporal operator other than PRESENT tense (or a generic operator in the habitual interpretation). The conclusion reached by these authors is that the difference between (2a) and (2b) is a difference in tense: control infinitives involve tense, hence license episodic eventive predicates, whereas ECM/raising infinitives lack tense, hence are claimed to prohibit episodic eventive predicates (unless the predicate occurs in the progressive, similar to *John is singing right now*) and can only combine with stative or generic/habitual complements. The adverbials *right now/then* are often used to indicate an episodic nongeneric interpretation. Since bare (i.e., nonprogressive) VPs are usually possible when the predicate is interpreted as generic/habitual, and furthermore, since bare stative predicates are possible (e.g., *Leo believed Julia to be smart*), the impossibility of eventive predicates thus only refers to *episodic, nongeneric, nonstative interpretations*.

- (2) a. Leo decided to bring the toys tomorrow. ✓ episodic interpretation
 b. *Leo believed Julia to bring the toys right then. *episodic interpretation
 cf. Leo believed Julia to be bringing the toys right then.

Constructions illustrating a discrepancy of the tense diagnostics discussed so far are, for instance, infinitives combining with the verb *claim*. As shown in (3a), the infinitive can involve control,¹ yet the infinitival complement does not receive a future irrealis interpretation, nor can a bare infinitival VP receive an episodic interpretation (see (3b)). The complement of *claim* must involve either a stative complement, as in (3a); a generic/habitual interpretation, as in (3b) without the adverbials; or progressive, as in (3c). The two syntactic properties associated with tense thus yield contradictory results: *claim*-infinitives would need to be tensed for the purpose of control, but tenseless for the purpose of episodic interpretation.

- (3) a. Leo claimed to be rich. control
 b. Leo claimed to eat dinner (*yesterday/*tomorrow). *episodic interpretation
 c. Leo claimed to be eating dinner right then.

In this article, I will take the distribution of episodic interpretations as the defining property for dividing infinitival constructions into different classes. I will show that there are three classes of

¹ Whether *claim*-infinitives can also involve (active) ECM appears to be subject to variation. Examples such as *#Mary claimed Bill to be the king of France* are considered to be impossible by most but not all speakers.

infinitival complements and propose an account for the distribution of episodic interpretations that is based on different structures and tense/aspect compositions of the different classes of infinitives.

A further property that has been proposed to diagnose tense in infinitives is the availability of VP-ellipsis, which is claimed to be possible in tensed but not tenseless infinitives (or in control but not ECM/raising infinitives; see Martin 1996, 2001). As shown in (4), however, this cannot be maintained. VP-ellipsis is possible in all infinitival constructions except *believe*-infinitives involving *be* (which is not surprising given the known restrictions on ellipsis with *be*; see, e.g., Lasnik 1995). In the course of this article, I will motivate the classifications and structures given in (4). For now, let me simply point out that VP-ellipsis is possible with control (see (4c,e)), ECM (see (4b,d,f)), and raising (see (4g)), as well as with future (see (4c,d,f)) and nonfuture (see (4b,e,g)) infinitives. While the marked status of VP-ellipsis with *believe* remains an open issue, the distribution of VP-ellipsis clearly cannot be related to the tense properties or the nature of the infinitival subject, and I will hence ignore VP-ellipsis in this article.

- (4) a. *Bill believes Sarah to be honest, and he **believes** Kim **to** as well. *believe
 b. ?They say that Mary doesn't like raisins but Bill **believes** her **to**. ?believe
 c. John wants to win but Jill doesn't **want to**. ✓ future control
 d. John wants (for) his team to win whereas Jill **wants** (for) her team **to**. ✓ for/ECM
 e. Kim isn't sure she can solve the problem but she will **try to**. ✓ nonfuture control
 John started to play the violin and Bill **began to** as well.
 Mary got to the finish line in under an hour, but Bill **failed to**.
 They say that Mary doesn't really like raisins, even though she **claims to**.
 f. They say that the tower will collapse soon and the bridge is **expected to** as well. ✓ future ECM/raising
 The first tornado will cross route 91, and the second one is **predicted to** as well.
 g. They say that Mary doesn't know French, but she **seems to**. ✓ nonfuture raising
 John does not like math but Mary **seems to**.
 The printer works, but the copier doesn't **seem to**.
 The tower started to fall down and the church **began to** as well.

Finally, the tense/tenseless distinction has played a crucial role in deriving the difference between different types of control, specifically the difference between *exhaustive* and *partial* control as proposed by Landau (1999, 2000, etc.). Following proposals made in Wurmbrand 1998, 2001, Landau notes that certain control infinitives—which he labels *partial control* infinitives—allow an interpretation in which the embedded subject is interpreted, not as identical to the matrix controller, but as a superset including the matrix controller. This is illustrated by (5b), which can receive the interpretation that the chair's preference is for a contextually salient group including that chair to gather at 6. Importantly, this type of control is not generally possible, but,

Table 1

Tense classifications in different approaches

Infinitive	Subject	Example	Null Case	P(&T)	Landau	Agreement?
Future irrealis	PRO	decide	[+tense]	[+tense]	[+tense]	yes
Nonfuture irrealis	PRO	try	[+tense]	[+tense]	[−tense]	no
Implicative	PRO	manage	[+tense]	[−tense]	[−tense]	no
Factive	PRO	hate	[+tense]	[−tense]	[+tense]	no
Propositional	ECM	believe	[−tense]	[−tense]	[+tense]	no

according to Landau, restricted to infinitives that involve tense. Thus, in this approach, the tense/tenseless distinction does not distinguish between control and ECM, which needs to be related to other properties (e.g., abstract agreement); rather, it distinguishes between two types of control.

- (5) a. *John tried to gather at 6. exhaustive (PRO = John)
 b. We thought that the chair preferred to gather at 6. partial (PRO = chair + group)

Table 1 summarizes the main classifications proposed in the different approaches. As the table shows, the only construction the works cited above agree on is the future irrealis infinitive. Regarding all other constructions, there is disagreement.²

In the course of this article, I will show that Landau's (1999, 2000) classification (which coincides with the one proposed in Wurmbrand 1998, 2001 based on the distribution of restructuring) best matches the semantic tense properties observed in different types of infinitives. In contrast to Landau, however, I will conclude that only propositional attitude infinitives involve tense, whereas the temporal orientation of future infinitives is contributed by a modal element (*woll*). Nevertheless, the temporal elements proposed in this article could take on the basic work that [+tense] does in Landau's system; hence, the account proposed here has the potential to carry over to the difference between exhaustive and partial control in a way similar to Landau's approach.³

3 Future Infinitives

In this section, I discuss future infinitives and argue that a future modal is present in these infinitives, but that tense is not. In section 3.1, I show that syntactically, future infinitives occur

² The *P(&T)* classification refers to Pesetsky 1992 and Pesetsky and Torrego 2001, 2004, 2006. These authors argue that the (im)possibility of an infinitive combining with a nominalized selecting predicate is another diagnostic of infinitival tense: a nominalized predicate can be combined with an infinitival clause only when the infinitive is tensed. Since future irrealis control infinitives can combine with a nominalized predicate (*John's decision to leave*), whereas implicative and factive control infinitives cannot do so (**Mary's dare to defy the government*; **John's happiness to have won the lottery*), the former are classified as tensed and the latter as tenseless. I will not be able to discuss nominalizations in detail in this article, but I provide a preliminary suggestion in footnote 32.

³ In this article, I only consider infinitives in complement position. Subject infinitives, infinitival interrogatives, and relatives are not discussed. These constructions arguably involve a CP domain and a more complex syntax.

as either control or ECM/raising infinitives in English. In section 3.2, I compare future infinitives with finite future contexts and conclude (a) that future infinitives are different from both finite *will*- and finite *would*-contexts, and (b) that the differences follow naturally if it is assumed that future infinitives lack tense, but include a future modal *woll*. Finally, in section 3.3, I provide evidence for the syntactic presence of *woll*.

3.1 Tense and the Control/ECM Distinction

The core control constructions in English are future infinitives, exemplified in (6a). However, as (6b) shows, there are also control infinitives that do not allow a future interpretation. The constructions in (6b) do not allow temporal modifiers referring to a time different from the matrix event time, and they can only receive a simultaneous interpretation (see section 4.4 for further details). Furthermore, (6c) shows that there are also propositional control infinitives. As we saw in section 2, infinitives combining with *claim* can involve control. Nevertheless, these infinitives cannot be interpreted with a (true) future orientation, as the impossibility of (6d) shows. Rather, the infinitive is interpreted as occurring simultaneously with the matrix event, or, in the case of (6e), as a planned/scheduled future (which is also possible in present tense contexts such as *I'm leaving tomorrow*). I will return to propositional infinitives in section 4.3.⁴

- | | | |
|--------|---|-----------------------------|
| (6) a. | Yesterday, John decided/wanted/planned to leave tomorrow. | future |
| b. | Yesterday, John tried/began/managed to leave (*tomorrow). | simultaneous |
| c. | Yesterday, John claimed to be leaving (right then). | |
| | | simultaneous; propositional |
| d. | *Yesterday, John claimed to leave tomorrow. | *future |
| e. | Yesterday, John claimed to be leaving tomorrow. | scheduled future |

More importantly for this section, there are also future irrealis infinitives that involve ECM. It is well-known that verbs like *want* and *expect*, which combine with future irrealis infinitives, can occur with an overt noun phrase that could be interpreted as the infinitival subject. However, it is controversial whether the constructions in (7) involve true ECM (Freidin and Lasnik 1981, Pesetsky 1982). Other possible structures are object control or a non-ECM structure where the infinitival subject receives case from a silent *for* (see, e.g., Bresnan 1972, Chomsky 1981, Pesetsky 1992, Bošković 1997, Martin 2001).

- (7) a. Yesterday, John wanted Mary to leave tomorrow.
 b. Yesterday, John expected Mary to leave tomorrow.

⁴ In English, propositional control infinitives are very rare. However, note that languages that do not allow English-style ECM typically involve control in cases where English requires ECM (e.g., German (i)).

(i) Er glaubt, PRO gewonnen zu haben.
 he believes PRO won to have
 'He believes himself to have won.'

Thus, crosslinguistically, propositional control is very common.

The case of *expect* allows us to tease apart the different options (see also Baltin and Barrett 2002, Hornstein 2003). Following Bresnan (1972) and Pesetsky (1992), examples such as (7b) are three-ways ambiguous. The different structures show different syntactic properties and different meanings, as summarized in (8). The object control structure in (8a) is interpreted as an order directed toward the postverbal NP referent (i.e., similar to what happens in the meaning of *require of*, the postverbal NP receives a θ -role from *expect* and hence has to refer to an NP capable of carrying out the order conveyed in the infinitive). The structure in (8b) corresponds to a ‘want’ or ‘require’ interpretation in that it expresses the matrix subject’s desires about a particular state of affairs, but in contrast to (8a), the order does not have to be directed at the NP referent. Finally, the ECM structure in (8c) expresses a belief by the matrix subject, with the additional restriction that *to expect something to be the case* conveys that the speaker does not yet know whether the content of the belief is true or not (if someone knows about a particular state of affairs, it would be odd to assert that he or she expects something to be the case).

- | | |
|--|----------------|
| (8) a. John expected Mary _{Obj} [PRO to leave] | ‘require of’ |
| b. John expected [\emptyset _{for} [Mary _{Subj} to leave]] | ‘require/want’ |
| c. John expected Mary [t _{Subj} to leave] | ‘believe’ |

There are two properties that allow us to single out the ‘believe’ structure in (8c), which will be useful for the purposes of this article: passive of *expect*, and an inanimate postverbal DP. Passive is only possible in (8a) and (8c), that is, in object control and (true) ECM constructions (e.g., *John was persuaded to leave*; *John was believed to have left*; but not **John was wanted to leave*). An inanimate postverbal NP is only possible in (8b) and in (8c), since object control requires an animate object—an individual that could sensibly function as the recipient of an order (e.g., *John wants the printer to work again*; *John believes the printer not to be working anymore*; but not #*John persuaded/required of the printer to work again*). Thus, examples such as (9a–c), which involve both passive *expect* and an inanimate subject, can reasonably be assumed to involve only a *believe*-type ECM/raising structure.⁵ Examples with this structure occur frequently, as can be verified by a Google search ((10a–c) are actual corpus examples). Crucially, as these examples show, a future interpretation is possible, and episodic interpretations are allowed for bare (nonprogressive) VPs. Other verbs falling in this category are shown in (11a–e) (based on similar examples given in Abusch 2004).

- (9) a. The printer is expected to work again tomorrow.
 b. The bridge is expected to collapse tomorrow.
 c. The train is expected to arrive late tomorrow.
- (10) a. Tourism is expected to bounce back . . .
 b. Holiday travel is expected to rise . . .
 c. The flu is expected to peak in roughly three to four weeks.

⁵ In the passive cases, there is no *exceptional case marking*. Since the crucial point is that in ECM/raising configurations the infinitival subject is an overt DP as opposed to PRO, I will continue to refer to these cases as ECM/raising.

Table 2

Tense and the control/ECM distinction

Infinitive	Examples	Syntax	Tense (infinitive)	Episodic interpretations
Irrealis future	decide, expect expect, predict	control ECM	future	possible
Propositional	claim believe, expect	control ECM	simultaneous	impossible

- (11) a. A solar eclipse is forecast to occur in Württemberg in August 2019.
 b. The petition is projected to have over 20,000 signatures by next week.
 c. The party is thought to start at 10 p.m.
 d. The storm is anticipated to hit the East Coast tomorrow.
 e. The storm is predicted to hit the East Coast tomorrow.

Thus, as summarized in table 2, (future) *expect* and the verbs in (11) behave like irrealis control infinitives regarding the tense properties, even though ECM/raising is involved.⁶

In what follows, we will see that these initial observations are confirmed by a more detailed consideration of the temporal properties of these infinitives, which will lead to the conclusion that future ECM (*expect*, etc.) and control (*decide*, etc.) cannot be distinguished on the basis of their tense properties, and that the control versus ECM/raising distinction in English must be encoded as part of the lexical properties of the selecting verb (see, e.g., Bruening 2006, where it is proposed that ECM verbs combine with a propositional complement in syntax, but semantically require two arguments and a property; according to Bruening, movement to object position is motivated by the need to turn the propositional complement into a property). Furthermore, in Wurmbbrand 2013, to appear (see also section 5), I propose that the type of infinitive is locally selected by the matrix verb via a feature valuation mechanism applying at Merge. Although I restrict my discussion there to the temporal features, it is entirely conceivable that this type of selection could also extend to nominal features regulating the difference between PRO and DP.

3.2 Differences between Infinitival Future and Finite Future

In this section, I will discuss the tense properties of future infinitives. I will show that future infinitives behave differently from both finite *will*-contexts and finite *would*-contexts, and I will argue that the differences follow naturally if it is assumed that future infinitives lack tense, but include a future modal *woll*. The basic differences are given in (12)–(15). First, (12) (control) and (13) (ECM/raising) show that, embedded under a matrix past tense, future infinitives can refer to a time before the utterance time (indicated by the modifier *yesterday*), whereas this interpretation is impossible in finite *will*-clauses. Second, (14) and (15) show that, embedded un-

⁶ In section 4.3, I will return to propositional attitude infinitives and show that *expect* ECM, like *believe* ECM, also allows propositional complements with a simultaneous interpretation.

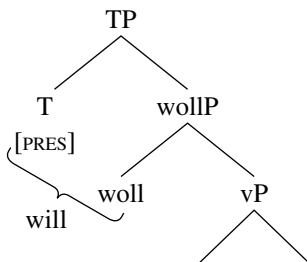
der a matrix future, future infinitives are possible, whereas finite *would*-clauses are only possible if *would* is interpreted as a conditional, and not as a temporal *would*.⁷

- (12) a. Leo decided a week ago to go to the party yesterday.
 b. Leo decided a week ago that he will go to the party (*yesterday).
- (13) a. According to a report I read last week, the bridge was expected to collapse yesterday.
 b. According to a report I read last week, it was expected that the bridge will collapse (*yesterday).
- (14) a. John will promise me tonight to tell his mother tomorrow that . . .
 b. *John will promise me tonight that he would tell his mother tomorrow that . . .
 [* unless conditional]
- (15) a. [Once the engineer finds out what we know, then . . .]
 The bridge will be expected (by him) to collapse tomorrow.
 b. [Once the engineering committee finishes reading the report . . .]
 *It will be expected (by many of them) that the bridge would collapse tomorrow.
 [* unless conditional]

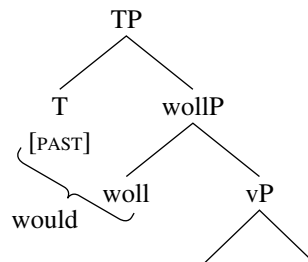
As indicated in section 3.1, these examples show that there is no difference between future control and future ECM/raising infinitives. In what follows, I will adopt an analysis of the future that will account for these differences.

3.2.1 The Composite Nature of Future I follow Abusch (1985, 1988) and many others who consider future not as a simple tense but as a complex tense composed of two parts: (a) a true TENSE part, present tense (henceforth PRES) or past tense (henceforth PAST), plus (b) the abstract modal *woll*, which contributes a modal force yielding posteriority (see, e.g., Thomason 1970, Condoravdi 2001, Copley 2002, Kaufmann 2005 for definitions of *woll*). Morphologically, PRES + *woll* is spelled out in English as *will* (16a), and PAST + *woll* is spelled out as *would* (16b).

(16) a. *Finite will*



b. *Finite would*



⁷ Since *expect* (in this ECM/raising configuration) expresses a belief about something unknown, it is somewhat odd and redundant to use *expect* in the future. The context given facilitates this use, but the examples remain marked, independently of the embedded clause. However, the contrast between infinitives and overt *would* is still indicative.

The composite structure of the future element *will* is motivated by the following properties, which I will summarize in turn: (a) the *indexical* or *absolute* nature of finite future and (b) certain *sequence-of-tense* effects.

As is well-known, English PRES is indexical/absolute in that it must be evaluated with respect to the utterance time (Enç 1987, Abusch 1988 et seq., Ogihara 1996, Schlenker 1999). This is illustrated by the so-called *double access* reading in (17a). Somewhat simplified, in English PRESENT-under-PAST contexts, the embedded time (the time of the pregnancy in (17a)) must contain both the matrix time (the finding-out time in (17a)) and the utterance time. An interpretation where the time of pregnancy overlaps with the finding-out time but does not reach up to the utterance time is impossible (this reading is possible, however, in languages such as Japanese or Hebrew where PRES is defined as a *relative* tense). Importantly for the purposes of this article, future contexts show the same absolute nature. Examples such as (17b) only allow an interpretation where the embedded time is after the utterance time. An interpretation where the time of pregnancy is after the finding-out time but before the utterance time is not available.

- (17) a. Leo found out that Mary is pregnant. absolute
 b. Leo found out that Mary will be pregnant. absolute

The absolute nature of sentences involving *will* follows straightforwardly if it is assumed that *will* decomposes (syntactically and/or semantically) into two parts, a future modal and an indexical/absolute PRES.

The second argument for the PRES component of *will* comes from the sequence-of-tense (SOT) phenomenon (see Dowty 1982, Enç 1987, 2004, Abusch 1988 et seq., Ogihara 1996, and many others). SOT refers to contexts in which a morphologically realized tense is semantically vacuous. For instance, in (18a), the embedded clause can receive a simultaneous “nonpast” interpretation—that is, an interpretation where the pregnancy time is not in the past with respect to the finding-out time but rather overlaps it. There are several views on how the SOT phenomenon is best accounted for. I cannot compare the different approaches here, and I will simply adopt a deletion approach such as the one proposed by Ogihara (1995a,b, 1996, 2007) (see also von Stechow 1995 for a different type of deletion view).

- (18) a. Leo found out that Mary was pregnant.
 b. [Leo PAST find out [that Mary PAST be pregnant]]
 c. [Leo PAST find out $\lambda 0$ [Mary 0-be pregnant]]

According to Ogihara’s deletion view, a tense may delete at LF if it is in the scope of another tense with the same value (e.g., the embedded PAST in (18b), which is in the scope of another PAST). Semantically, the deleted tense variable then gets bound by a λ -operator (see (18c)). Following Heim (1994), the bound tense variable is then interpreted as a relative NOW with respect to the matrix predicate, which yields the desired simultaneous (i.e., nonpast) interpretation in (18) (i.e., the pregnancy time will be a NOW relative to Leo’s finding-out time).

Turning to future statements, it has been observed that future contexts trigger SOT for embedded PRES. This is illustrated in (19a), which allows two temporal interpretations: the time of walking could overlap either the utterance time or just the time of seeing. The former interpretation arises if *is walking* is interpreted as PRES (see (19b)). The latter interpretation, on the other hand, shows that the embedded tense is interpreted not as PRES but as a NOW relative to the time of John's seeing. Assuming that future consists of PRES plus *woll*, it follows without further assumptions that (19c) is an SOT context—that is, a context that allows deletion of the embedded PRES since it is in the scope of another PRES.

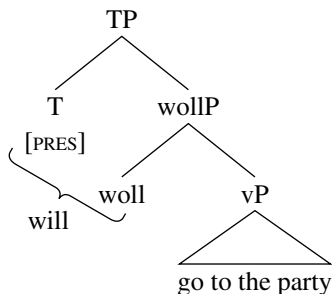
- (19) a. John will see the unicorn that is walking.
 (Ogihara 1996:82)
 b. PRES *woll* see [_{NP} PRES walk]
 c. PRES *woll* see [_{NP} PRES walk]

3.2.2 Infinitival Future Is Tenseless Returning to the examples in (12) and (13), repeated in (20), the difference between finite and infinitival future is that finite future is *absolute* (i.e., the time of the embedded event must be after the utterance time), whereas infinitival future is *relative* (i.e., the embedded event can occur before the utterance time, as long as it is after the time of the matrix event).

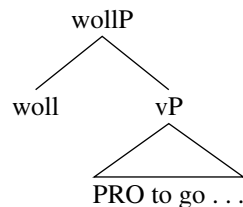
- (20) a. Leo decided a week ago to go to the party yesterday.
 According to a report I read last week, the bridge was expected to collapse yesterday.
 b. Leo decided a week ago that he will go to the party (*yesterday).
 According to a report I read last week, it was expected that the bridge will collapse (*yesterday).

I would like to suggest that the difference between finite and nonfinite future is due to the presence (finite) versus absence (nonfinite) of tense.

(21) a. *Finite future*



b. *Nonfinite future*



Both finite and nonfinite future constructions involve the future modal *woll*; however, PRES is only projected in finite clauses, not in infinitives. PRES in (21a) guarantees that finite future constructions are absolute, whereas the lack of tense in (21b) has the effect that nonfinite future

is relative (later on, I propose that there is also an aspectual projection above vP; since it is irrelevant for the current discussion, I ignore it here).⁸

There are two alternatives to the view that infinitives are tenseless (within this framework). First, one could suggest that future infinitives do involve PRES tense, but that infinitival PRES is defined differently from finite PRES—that is, infinitival PRES is *relative*, like PRES in Japanese and Hebrew, for instance. Second, one could assume that infinitival future corresponds not to *will* but to *would* (Martin 1996, 2001). As shown in (22), in contrast to *will*, *would* is relative in English since it does not require the future event to be after the utterance time. The common explanation for this fact is that *would* is composed of PAST + *woll* and that PAST is relative in English (see Abusch 1988).⁹

- (22) a. Kim decided a week ago that she would go to the party yesterday.
 b. According to a report I read last week, it was expected that the bridge would collapse yesterday.

A closer look at SOT in infinitives suggests an argument against these alternatives. Following Ogihara (1996), I assume the SOT rule in (23).

(23) *The SOT rule*

If a tense feature B is the local tense feature of a tense feature A at LF, and A and B are occurrences of the same feature (i.e., either [+past] or [+pres]), A and the tense associated with A (if any) are optionally deleted. N.B.: (i) The tense features include [+past] and [+pres] and nothing else. (ii) A tense feature A is “in the scope” of a tense feature B iff B is associated with a common noun and asymmetrically c-commands A, or B is associated with a tense or a perfect and asymmetrically commands A. (iii) A tense feature B is the local tense feature of a tense feature A iff A is “in the scope” of B and there is no tense feature C “in the scope” of B such that A is “in the scope” of C. (Ogihara 1996:134)

The relevant parts of this rule for present purposes are (i) and (iii): tenses are defined as PAST and PRES, and there is a Minimality-type condition on SOT. This locality effect is illustrated in

⁸ I do not take a specific position about the infinitival marker *to*. As discussed in Wurmbrand 2001, there is no evidence that *to* is a tense element. Because it occurs in control (*decide*), raising (*seem*), and ECM (*believe*) infinitives, it does not require a particular type of subject/construction. Because it occurs in all semantic types of infinitives (irrealis (*decide*), propositional (*claim*), implicative (*forget*), factive (*hate*), aspectual (*begin*), and modal (*have to*)), no unique semantic property can be attributed to it (for that reason, Pesetsky (1992) proposes that there are many different versions of *to*). Furthermore, *to* occurs lower than negation in sentential negation contexts (*He tried not to win*; the construction *He tried to not win* is typically seen as a case of constituent negation). If one’s theory requires a syntactic head for each morpheme, the options would be InfP (Kayne 1989), an aspectual projection (Travis 1994, 2000), or infinitival v.

⁹ There are two other options, which would also account for the differences between finite and nonfinite future statements presented in this section: (a) nonfinite future involves a *zero tense* (as suggested for instance in Kratzer 1998 for embedded attitude contexts in general); (b) infinitival future is either PRES + *woll* or PAST + *woll*. In section 5, I provide reasons for not adopting either of these alternatives.

(24) (see Ogihara 1995b:677, 1996:93, 2007:415 for different examples; to facilitate parsing of these examples, I underline the verbal elements). Examples such as (24a) do not allow a nonpast reading of the most deeply embedded clause. To express a simultaneous interpretation, *would* must be used instead of *will* (see below). More concretely, (24a) cannot have the interpretation ‘John promised me to say to his mother tomorrow, “We are (now) having our last meal together.”’ Thus, SOT cannot apply in (24a). This follows from the SOT rule. As shown in (24b), the lower PAST is not immediately under the higher PAST; the PRES tense of *will* intervenes between the two PASTs, and therefore SOT is blocked. The only interpretation possible in (24a) is a true past interpretation (to use progressive in the clause embedded under *will*, a time specification is necessary, as provided for instance via a *when*-clause, to indicate the reference interval).

- (24) a. John promised me yesterday that he will tell his mother tomorrow that they were having their last meal together (when . . .).
 b. [PAST promise [PRES woll tell [PAST meal]]] *SOT

Turning to infinitives, we find a crucial difference. The example in (25a) (which differs from (24a) only in that the middle clause is nonfinite) allows a simultaneous nonpast interpretation (see also Ogihara 1996, Abusch 1997, Enç 2004 for other examples to the same effect). That is, the interpretation of (25a) can be ‘John promised me to say to his mother tomorrow, “We are (now) having our last meal together”’. The assumption that infinitives are tenseless (see (25b)) correctly predicts this interpretation: since there is no tense intervening between the triggering PAST and the target PAST, the latter can delete. The resulting interpretation then is one where the time of the meal is a NOW relative to John’s telling. If, on the other hand, infinitives were to involve a PRES tense, whether absolute or relative (see (25c)), the wrong prediction would be made: PRES should block SOT, exactly as in (24), but in fact it does not.

- (25) a. John promised me yesterday to tell his mother tomorrow that they were having their last meal together.
 b. [PAST promise [Inf ∅]] woll tell [PAST meal] ✓ SOT
 c. [PAST promise [Inf PRES_{Rel} woll tell [PAST meal]]] ??

As before, future ECM/raising *expect*-constructions behave in exactly the same way. (26) gives the relevant examples. (26a) shows that a (true) PAST interpretation is possible under finite *will*. To express an interpretation where the time of stepping down is simultaneous with the time of the announcement, a PAST under *will* is impossible (see (26b)); a PAST can be used in the deepest embedded clause only if the higher clause involves *would* as in (26c)—that is, a higher PAST. On the other hand, an embedded PAST is possible under an infinitival future; in contrast to (26b), (26d) can mean that the announcement is ‘Bill is stepping down right now.’ Finally, (26e) shows that an SOT interpretation becomes impossible in the infinitival construction when the matrix clause does not involve a PAST. Since SOT is impossible in this configuration, only a true PAST interpretation is possible, which is infelicitous in the context given (it would be possible again if the embedded clause were as in (26a): . . . say that Bill was stepping down when . . .).

- (26) a. It was expected that the announcement will say that Bill was stepping down
(when . . .). shifted PAST
- b. #It was expected that the announcement will say that, as of that moment, Bill
was stepping down. *SOT
- c. It was expected that the announcement would say that, as of that moment, Bill
was stepping down. ✓ SOT
- d. The announcement was expected to say that, as of that moment, Bill was
stepping down. ✓ SOT
- e. #The announcement will be expected to say that, as of that moment, Bill was
stepping down. *SOT

The difference in interpretation between finite and nonfinite future contexts hence provides evidence against the presence of any type of PRES in infinitives.¹⁰ Furthermore, the difference between (26d) and (26e) leads us toward evidence against the second option mentioned above, namely, the suggestion that infinitives involve a silent *would*. To complete the paradigm, a quick detour about the properties of temporal *would* is necessary.

As noted by Abusch (1988) and Ogihara (1995a, 1996, 2007) among others, *would* triggers SOT for embedded PAST. This is illustrated by (27a), which can have the interpretation ‘John promised me to say to his mother tomorrow, ‘‘We are (now) having our last meal together’’’. Since the lowest PAST is in the scope of another PAST (the PAST of *would*), SOT is correctly predicted to be possible (see (27b)). The resulting interpretation is then one where the time of the meal is a NOW relative to the time of John’s telling (exactly as in (25)).

- (27) a. John promised me yesterday that he would tell his mother tomorrow that they
were having their last meal together.
- b. [PAST promise [PAST woll tell [PAST meal

However, the situation is more complex in cases involving embedded temporal *would*. Although (27a) is ambiguous between whether the most embedded clause involves a PAST or an SOT interpretation, an interpretation the sentence cannot have is one where the time of telling *precedes* the time of promising. In principle, such an interpretation could arise if the PAST of *would* is not deleted and hence shifts the time of telling before the time of promising. Furthermore, if the future modal *woll* situates the time of telling after that PAST time, but not after the time of promising, an interpretation similar to a simple PAST could arise. This is illustrated further in (28). As (28a) (= (18a)) shows, PAST-under-PAST contexts are ambiguous between a true PAST interpretation (i.e., a non-SOT interpretation where the pregnancy time is before the finding-out

¹⁰ One could, of course, define SOT such that PRES_{Rel} is exempt from the SOT rule. However, this seems to then simply restate the fact that infinitival tense (which is already ‘‘special’’ in that it is relative) is also invisible in contexts where we would expect a tense to show certain effects. Essentially, PRES_{Rel} would then reduce to a Kratzer-style *zero* tense, and the question would be whether the presence of such a tense is motivated. Although I cannot exclude this option, in section 5 I provide some reasons for not adopting it.

time) and a simultaneous non-PAST interpretation (i.e., an SOT interpretation where the pregnancy time overlaps the finding-out time). Examples such as (28b), on the other hand, which involve *would* under PAST, have only the non-PAST (SOT) interpretation in (28c)—that is, an interpretation where the pregnancy time is after (because of *woll*) the relative NOW that corresponds to the finding-out time. The sentence cannot refer to a situation where the pregnancy is after some time in the PAST of the finding-out time but still before the finding-out time (a scenario that should be possible if the structure in (28d) were an option).

- | | | |
|---------|--|-------------|
| (28) a. | Leo found out that Mary was pregnant. | SOT/no SOT |
| b. | Leo found out that Mary would be pregnant. | SOT/*no SOT |
| c. | [_{Matrix} PAST find out [_{CP} PAST <i>woll</i> pregnant | SOT |
| d. | *[_{Matrix} PAST find out [_{CP} PAST <i>woll</i> pregnant | *no SOT |

There are various ways to exclude the impossible meanings of (27a)/(28b). The past interpretation could be ruled out via a presupposition that the denotation of *will/would* is future with respect to the local evaluation time. Similar to the *upper-limit constraint* proposed for PAST-under-PAST contexts in certain frameworks, which sets an upper limit for embedded PAST (see Abusch 1994, 1997, Heim 1994), embedded *woll* could be assumed to be subject to a ‘‘lower-limit constraint,’’ which makes the local evaluation time the lower limit for the denotation of embedded *woll* tenses.¹¹ Another option is to assume that in the case of *would*, SOT is obligatory (Kusumoto 1999). While this assumption may appear ad hoc, it is supported by several properties. First, as pointed out to me by Ezra Keshet, temporal *would* cannot appear unembedded (unless it is used in a special story-telling context): **Yesterday, I would be king* is impossible, in contrast to *Yesterday, I was going to be king* (see also Enç 2004).¹² Second, obligatory SOT finds support in examples where *would* is embedded under *will* such as (29a). Crucially, examples of this sort are ungrammatical with temporal *would* (again, the sentence is possible if *would* is conditional). The restriction that *would*-contexts must be interpreted as future with respect to the local evaluation time (*tonight* in (29a)) is not violated in this case, yet the example is impossible. Assuming that *would* comes with the restriction that the tense part must delete obligatorily via the SOT rule, an account is available. If the SOT rule does not apply, this special requirement of *would* is not met. However,

¹¹ Alternatively, the restriction could be seen as a kind of economy condition that blocks vacuous *woll*; that is, a PAST + *woll* structure is excluded in favor of a simple PAST configuration in cases where the interpretation corresponds to a PAST tense. Ogiwara’s (1995a:204) informal definition of *Temporal Directionality Isomorphism* seems to express a similar idea: ‘‘... any attitude report must be made in such a way that the temporal directionality of the original attitude as reported by the sentence agrees with the temporal directionality of the tense morpheme used in the verb complement clause. The temporal directionalities of tenses are given as follows: simple past tense is previous-time-oriented; simple present tense is current-time-oriented; and future auxiliary (*will* or *would*) is future-time-oriented.’’

¹² Enç (2004) proposes that [+past] modals such as *would*, when embedded under PAST, are ‘‘anaphoric,’’ which has the effect that the evaluation time for the embedded tense (the modal *would*) can only be the matrix event time. Furthermore, the lexical entry for *would* when bound to the matrix event time is assumed to essentially involve a vacuous [+past] in that it is stipulated that the event time (of the embedded *would*) must follow the evaluation time. While this system correctly derives the properties of *would* under PAST, it is not clear whether it excludes the cases of *would* under PRES discussed below in the text.

since (29a) is not an SOT environment (*PAST* is under *PRES* in (29b) and not under *PAST* as required by the SOT rule), deletion is not allowed. Thus, there is no way to satisfy both the special requirement of *would* and the SOT rule.

- (29) a. *John will promise me tonight that he would tell his mother tomorrow that . . .
 [OK if conditional]
 b. [_{Matrix} *PRES* woll promise [_{Inf} **PAST*/~~**PAST*~~ woll tell . . .

Although an explanation of this special property of *would* is still outstanding, it seems that for the purposes of this article it is sufficient to simply state it as an assumption.

Let us now finally return to infinitives. (29a) should be contrasted with (30a). Note first that the only difference between (29a) and (30a) is the finiteness of the middle clause. Crucially, (30a) is fully grammatical. This fact clearly shows that it cannot be assumed that infinitives involve a silent *would*. If this were the case, (30a) should not differ from (29a). Moreover, the interpretation of (30a) indicates once more that there is no tense in these infinitives. (30a) cannot receive the interpretation ‘John will promise me tonight to say to his mother tomorrow, “We are (now) having our last meal together”’. Under the assumption that infinitives lack tense, (30a), which is schematized in (30b), does not constitute an SOT context. Since embedded *PAST* is not in the scope of another *PAST*, SOT is correctly predicted to be blocked, and hence, the lowest clause in (30a–b) receives only a true *PAST* interpretation. If, on the other hand, infinitives were to involve a silent *would*, that is, a *PAST* as in (30c) (and if one could somehow get around the difference between finite and nonfinite *would*), it seems that the prediction would be that SOT should be possible since the deepest embedded *PAST* would be in the scope of another *PAST*. However, this is not correct.

- (30) a. John will promise me tonight to tell his mother tomorrow that they were
 having their last meal together (when . . .).
 b. [*PRES* woll promise [\emptyset woll tell [*PAST* meal *SOT
 c. [*PRES* woll promise [*PAST* woll tell [~~*PAST*~~ meal

Once again, future ECM/raising constructions display the same properties. (31a) shows that finite *would* under *will* is impossible (see also the examples in (15)), whereas no such restriction exists in the infinitive in (31b). Furthermore, the embedded past tense in (31b) can only receive a true *PAST* interpretation, and SOT is correctly predicted to be impossible under the assumption that infinitives are tenseless.

- (31) a. *It will be expected that the announcement would say . . .
 [* unless conditional]
 b. The announcement will be expected to say that Bill was stepping down (when . . .).

Before turning to other types of infinitives, I will discuss a further prediction of this account (see also section 5 for further predictions and alternatives). The assumption that infinitives are tenseless predicts that SOT should not apply to *PRES* in contexts such as (32a). Testing this prediction, however, is complicated by the fact that *PRES* can refer to future situations in English when the event is interpreted as planned or scheduled (see (32b)). For the speakers I consulted,

futurate interpretations are possible with basically any predicate, provided an appropriate context is given. Thus, the fact that (32a) can receive a simultaneous interpretation (the interpretation where John will tell his mother, ‘‘We are (now) having our last meal together’’) is not a counterexample to the claim that SOT does not apply in this context. This is further supported by the fact that the same interpretation is available in (32c), that is, a context where there is clearly no PRES above the embedded PRES.

- (32) a. John promised me to tell his mother tomorrow that they are having their last meal together.
 b. They are having their last meal together tomorrow.
 c. John promised me that he would tell his mother tomorrow that they are having their last meal together.

The same is true for (33a–b), which can both be used in a situation where it is not snowing at the utterance time, but where the announcement is ‘‘It is snowing now.’’

- (33) a. Last week, the weatherman hoped to announce on Christmas Eve that it is snowing.
 b. Last week, the weatherman hoped that he would announce on Christmas Eve that it is snowing.

As expected, the same holds again for future ECM/raising constructions. The examples in (34) can all be used in a situation where it is not snowing at the utterance time, but where the display will be ‘‘It is snowing now.’’ Although the distribution of present tense still awaits a satisfactory account, the fact that PRES allows a (nonabsolute) simultaneous interpretation even when it is embedded under *would* (i.e., when SOT cannot apply) shows that the above cases do not challenge the assumption that infinitives are tenseless.

- (34) a. The weather clock was expected to display on Christmas Eve that it is snowing.
 b. It was expected that the weather clock will display on Christmas Eve that it is snowing.
 c. ?It was expected that the weather clock would display on Christmas Eve that it is snowing.

To conclude, the interpretation of the temporal properties of future infinitives supports the claim that future infinitives lack (contentful) tense (but see section 5 for possible alternatives). Tenseless structures correctly predict that infinitival future is relative and that infinitives do not participate in the computation of SOT. I proposed that the future interpretation is contributed by a future modal *woll*, which I will argue in the next section is represented syntactically.

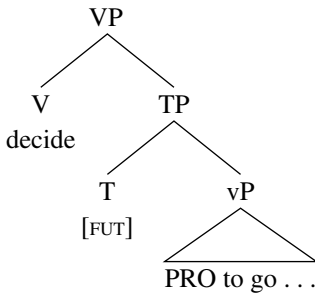
3.3 *Woll in Future Infinitives*

In contrast to the syntactic approaches summarized in section 2, which assume that future is a property encoded as tense as in (35a) (which, as we have seen, raises certain questions about the difference between finite and nonfinite future), many semantic approaches assume that infinitives are tenseless and that the future orientation of an infinitive is contributed by the meaning of the

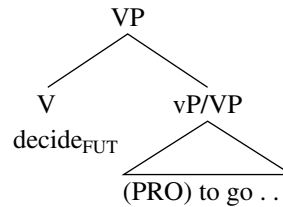
selecting predicate (see, e.g., Ogihara 1996, Abusch 1997, Katz 2001, 2004, Enç 2004). Under this view, the presence of tense and a syntactic TP would not be motivated on semantic grounds, and tense could be absent as in (35b). In the previous section, I argued that infinitival future should not be treated as a tense. In this section, I will address the question of whether future infinitives involve a syntactic representation of the future element *woll* or whether future is contributed (solely) as part of the meaning of the embedding verb.

A common view is that syntactic (LF) structure transparently reflects (certain) semantic properties of a sentence. Under this view, temporal elements would be present and visible in the structure. I will present two different types of arguments for this view and specifically for the structure in (35c). The first argument for the syntactic presence of a future element will be an extension of an argument made by Abusch (2004) based on scope. The second argument will be an indirect argument for syntactic future based on the distribution of restructuring in German.

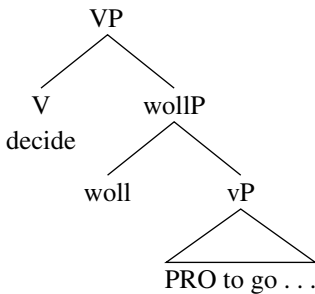
(35) a. *Future tense*



b. *Semantic future*



c. *Future modal*



3.3.1 Abusch's (2004) Scope Argument In this article, I follow Abusch (2004), who argues that the semantic operator responsible for the future interpretation of infinitives is present syntactically (but see section 5 for differences between Abusch's account and mine). The argument Abusch gives for the syntactic presence of the future operator comes from examples such as (36) (= Abusch's (76)) and (37) (= Abusch's (79)–(80)). The context in which Paul is mistaken about a particular woman's being Guido's sister is set up to guarantee a *de dicto* interpretation for the NP *a sister* in (36a), as well as the definite description *the woman who might have a crush on him* in (36b), since the former is the presuppositional antecedent of the latter. Furthermore, as illustrated by the possible continuation in (36c), according to Paul's beliefs, the time of the crush

precedes the time of the intended conversation. Assuming that *might* involves a temporal argument that needs to be bound, Abusch concludes that in (36b), this argument is bound by the same operator that binds the highest tense variable in the embedded clause, which is assumed to be the attitude holder's *contemporary now* (since the time of *might* is simultaneous with what the attitude holder considers to be his or her NOW), rather than by the embedded future operator associated with *would*.

- (36) Context: Some time ago, Paul misidentified a coworker of Guido's as Guido's sister.
- a. Paul₁ believed that Guido had a sister₂, and that she₂ might have a crush on him₁.
 - b. He believed that eventually he would have a long frank conversation with the woman who might have a crush on him.
 - c. But he believed that at that point she would not have a crush on him any more.

Turning to infinitives, Abusch notes that the same interpretation is possible in future infinitives such as those in (37): the time of the (possible) crush can again be understood to be prior to the time of the intended dinner; thus, the temporal variables associated with *might* and *have dinner* are bound by different binders.

- (37) a. Paul decided to eventually have dinner with the woman who might have a crush on him.
- b. Paul promised to eventually have dinner with the woman who might have a crush on him.

Before discussing the relevance of these data in more detail, I add similar examples making the same point, but with temporal *would* instead of the modal *might*. The context given again singles out a *de dicto* interpretation of the NP combining with the relative clause. Furthermore, the time of the relative clause (the time of calling) is set to a time *before* the time of the infinitive (the time of the dinner). Examples (38b–c) are possible in this context. For completeness, (38d–e) are given to show that *would* is subject to obligatory SOT, which is only possible if it occurs under another PAST. This is the case in (38b–c), but not in (38d–e). (38d–e) are thus excluded on the same grounds as (29a) (**He will promise me that he would . . .*).

- (38) Context: Remy met a man who she mistakes as her friend's doctor about whom everyone says that he is very reliable and trustworthy and that he always keeps his promises. They go out and he promises to call her back later tonight. Remy is very excited and starts making plans for their next date already. What Remy doesn't know is that this man is exactly the opposite of her friend's doctor—he's unreliable and never calls people back.
- a. Remy believes that she went out with her friend's doctor and that he will call her back tonight.
 - b. Remy decided to have dinner with the man who would call her back tonight.
 - c. Remy planned to have dinner with the man who would call her back tonight.
 - d. *Remy hopes to have dinner with the man who would call her back tonight.
 - e. *Remy is planning to have dinner with the man who would call her back tonight.

The relevant parts of the examples in (37) and (38) are given in (39a).¹³ The exact syntactic (LF) structure depends on one's assumption about whether time and world variables must be bound locally or can also be bound nonlocally. I will not take a position on this question here, but will give the structures for both approaches. Crucially, under both views, we have evidence for the presence of a future operator separate from the selecting verb in future infinitives. If world/time variables must be bound locally, (37) and (38) would lead to the LF configuration shown in (39b) (which is what Abusch concludes). The *de dicto* interpretation of the definite descriptions confines the NP to the embedded clause (within the scope of the matrix verb). To yield an interpretation where the time of the relative clause is before the time of the infinitive, the NP including the relative clause must move outside the scope of the future operator (= SUB in Abusch's system; see section 5), but below the binder that binds the tense variable associated with the future operator. The result then is that both the time variable of the future operator and the highest time variable in the relative clause are associated with the attitude holder's NOW. The future operators (*woll* in the infinitives and the *woll* part of *would* in (38b–c)) then shift the time of the dinner and the time of calling to the future relative to the attitude holder's NOW; but since there are two future operators, this is done independently and different orderings between the time of the dinner and the time of calling can be derived.

- (39) a. PAST decide [_{Inf} woll have-dinner-with [_{NP} the-(wo)man-might/would-VP]]
 b. Paul promised/decided [_{CP} λn [the woman who might(*n*) have a crush on him]
 λe_3 [_n [SUB λn [PRO have dinner with e_3]]]]
 (Abusch 2004:49)
 c. decide λw_1 *woll* (w_1 , λw_2 [have-dinner-with (w_2 , the-woman-might/would-VP
 (w_1))])
 d. *decide + future λw_1 [have-dinner-with (w_1 , the-woman-might/would-VP (w_2))]

If time/world variables can be bound nonlocally, movement as in (39b) is not necessary, and the structure could be as in (39c), where the highest binder binds the tense variables of both *woll* and the highest tense in the relative clause. Importantly, both (39b) and (39c) involve a future operator, which is exactly what allows us to use the binders associated with the matrix verb and the future element separately. The binder associated with the matrix verb (λw_1) binds the time variable of *woll*, as well as the time variable of *might/would*, whereas the binder associated with *woll* (λw_2) only binds the time variable of the infinitive. If, as in (39d), the matrix predicate and infinitival future were not separated, there would only be one binder, and the only interpretation that could be derived would be one where all time variables were bound by the same binder. In the examples involving *might* in (37), this would not allow an interpretation where the dinner and the crush are temporally located at different times. In the examples involving *would* in (38), this would only lead to an interpretation where the calling is after the dinner, and not before as intended in those examples. To yield such an interpretation, the highest tense variable of the relative clause should not be bound by λw_1 , as in (39d), but this configuration is excluded since

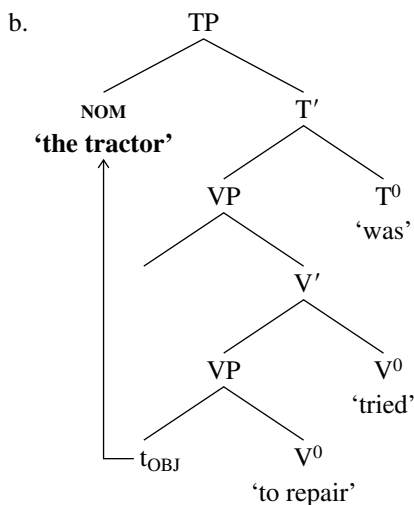
¹³ I thank one of the reviewers for very helpful comments regarding the relevance of these examples.

there would then not be a binder for that tense variable (recall that the *de dicto* interpretation requires a binder within the infinitival clause).¹⁴

In sum, examples such as those in (37) and (38) provide evidence for the existence of a future operator—which I have assumed to be *woll*—within the infinitival clause.

3.3.2 Woll and Restructuring The second (indirect) argument for the syntactic presence of a future element is based on the phenomenon of restructuring in German—in particular, constructions involving *long passive* as in (40a).¹⁵ *Long passive* refers to a construction where the embedded object of an (active) infinitive appears with nominative case rather than accusative. In previous works (Wurmbrand 2001, etc.), I have argued that long passive indicates the lack of case projections in the infinitive (see (40b)). Since the embedded object in (40a) cannot receive case within the infinitive, it becomes case-dependent on the matrix predicate. In (40a) the matrix verb is passive, and hence the object ends up with nominative. The crucial property of this construction is thus the lack of embedded case projections, such as vP and TP.

- (40) a. dass der Traktor zu reparieren versucht wurde
 that the.NOM tractor to repair tried was
 ‘that they tried to repair the tractor’



¹⁴ A reviewer wonders whether examples like those in (37) and (38) could perhaps be derived without a separate future operator if temporal reference were accounted for by means of anaphora rather than binding. The idea, according to this reviewer, would be that the temporal properties of the infinitive are controlled by the matrix verb, but the temporal properties of the relative clause are not. I leave comparing the current approach to such an alternative approach for future research. In section 3.3.2 I will, however, present another argument for the syntactic presence of a future element, which, as far as I can see, this alternative view cannot easily accommodate.

¹⁵ It has occasionally been suggested that the long passive construction is “marked” and that thus no conclusions can be drawn from its properties. However, data collected from a Google search show that long passive is a frequently occurring construction and is felt by many speakers to be natural in context (see <http://wurmbrand.uconn.edu/> for the results of the corpus search). One explanation for the marked status of this construction is that there is a normative bias

Returning to the discussion of infinitival tense, long passive is of interest because it shows a restriction on the temporal interpretation of the infinitive: this operation is not possible in future infinitives such as (41).¹⁶ This relation between future and case, I argue, receives a straightforward account under the assumption that future is represented structurally, whereas it would be unexpected under the view that future is contributed solely by the meaning of the matrix predicate.

- (41) *dass der Traktor zu reparieren geplant wurde
 that the.NOM tractor to repair planned was
 'that they planned to repair the tractor'

Following proposals in Wurmbrand 2001, I assume that the clause structure of infinitives is "flexible" in that the complement of a verb like *versuchen* 'try' can come in different sizes: CP, TP, vP, or VP (see (42)).

(42) *Degrees of restructuring* (Wurmbrand 2001)

- | | | | | | | | |
|----|-----------|-----|-----------|-----|-----|------|-----------------------------|
| a. | matrix V | [CP | [TP/wollP | [vP | [VP |]]]] | no restructuring |
| b. | matrix V | | [TP/wollP | [vP | [VP |]]] | "a little" restructuring |
| c. | matrix V | | | [vP | [VP |]] | "more" restructuring |
| d. | matrix V | | | | [VP |] | "most" restructuring |
| e. | *matrix V | | [wollP | | [VP |]] | *truncation from the middle |

The choice of the size of the infinitival complement correlates with the degree of restructuring. If a full CP complement is projected, no restructuring effects are found since the infinitive is a full clause, and hence, operations that are bound to occur within their clause cannot cross the infinitive. If CP is absent, but TP and vP are projected, certain clause union properties are possible (e.g., pronoun fronting and focus scrambling in German), but properties such as Case assignment

against using it, which would explain the variability in judgments (and would also accord with the results of an experimental study reported in Bader and Schmid 2004). Furthermore, as demonstrated in Bobaljik and Wurmbrand 2005, the complex scope properties of this construction are surprisingly stable and uniform, showing that even speakers who are biased against the construction have sharp intuitions about it—a fact that clearly points to the conclusion that this construction is part of these speakers' linguistic competence and hence a valid context for testing theoretical predictions.

¹⁶ Two remarks are in order here. First, in addition to being prohibited in future infinitives, long passive (in fact, restructuring in general) is prohibited in propositional and factive infinitives, that is, infinitives that are analyzed as [+tense] in Landau 1999, 2000, etc. In section 4.3, I show that propositional infinitives impose the now of the propositional attitude holder as the reference time of the infinitive. Together with the fact that restructuring is impossible in propositional infinitives, this could be seen as indirect support for the presence of syntactic tense in these infinitives.

Second, there is some debate about which contexts allow long passive and which contexts prohibit it. Wöllstein-Leisten (2001), for instance, claims that long passive is accepted by some speakers in apparent future contexts. While it is true that the temporal semantic composition of some of these cases needs further investigation (and might turn out to show that in addition to the syntactic representation of future, certain aspects of infinitival future must also be assumed to be contributed by the meaning of certain selecting predicates), I believe that the generalization stated in the text is not challenged by the facts reported there, as most cases can also be analyzed as nonfuture contexts. As far as I am aware, examples that require a future interpretation and are incompatible with a simultaneous interpretation (as diagnosed, for instance, by the presence of future adverbials) clearly prohibit long passive.

that target TP or vP are restricted to occurring within the infinitive.¹⁷ Crucially, however, as indicated in (42e), projections are not left out arbitrarily. Rather, structure is built uniformly, with restructuring being special only in that the functional domain is not built up to the top. Thus, the presence of higher functional projections entails the presence of lower ones, and a structure such as (42e) is impossible.

Under these assumptions, the prohibition against long passive in future infinitives follows. An infinitive combining with a verb like ‘plan’ receives a future interpretation, which is part of the lexical and/or semantic specification of future-taking complements (I will show in section 5 how this selectional relation is implemented structurally). In an approach such as the one pursued here, this means that future must be represented syntactically; hence, a wollP must be projected as in (43a). The presence of a wollP, however, entails the presence of a vP, and hence a structure such as (43b) will be impossible.¹⁸ Therefore, in future contexts, the embedded object is always assigned case by the accusative-assigning vP within the infinitive.

- (43) a. ‘plan’ [wollP [vP [VP]]]
 b. *‘plan’ [wollP [VP]]
 c. ‘try’ [VP . . .]
 d. *‘plan’ [VP . . .]

In contrast, ‘try’-infinitives do not involve a future interpretation, and therefore no wollP is projected. Assuming the highest degree of restructuring, only a VP is projected (see (43c)), and hence the object cannot receive case in the infinitive but will become case-dependent on the matrix predicate. Finally, a structure such as (43d) is impossible since future must be represented structurally and this structure does not meet the selectional properties of ‘plan’.

Turning now to a purely semantic view on infinitival future, the future-case correlation would be unexpected on this view. If the future interpretation of an infinitive is built into the semantics of the selecting predicate and not represented structurally, it would not be clear why future infinitives could not be bare VPs. That is, it would be unclear why a simple VP-complementation structure is possible for complements of ‘try’ as in (44a), but not for complements of ‘plan’ as

¹⁷ An interesting question is why German allows different-sized complements for verbs like *versuchen* ‘try’. The tests given in Wurmbrand 2001 target syntactic properties, and the different sizes show no detectable semantic differences regarding TPs and CPs (for these types of verbs). At the moment, I can only conclude that, although there is a close connection between the semantic temporal properties and the syntactic structure in that semantic tense is transparently reflected syntactically, syntax does also lead an independent life to some extent, since the lack of tense does not seem to preclude (semantically vacuous) syntactic projections. However, in the theory of selection developed in Wurmbrand 2013, to appear, the variability of complements for ‘try’-infinitives will not be unexpected. I propose there that future and propositional infinitives are locally selected by the matrix verb; thus, only one type of complement is possible. For ‘try’-infinitives (and other simultaneous infinitives; see section 4.4), no specific value of the complement is selected, and hence different-sized complements are in principle possible.

¹⁸ Note that the restriction in (43b) is a restriction on restructuring (i.e., on leaving off functional projections), not a claim about the clausal architecture in general. Thus, if the argument structure of a predicate does not involve a vP (as, for instance, in unaccusatives), a VP could, of course, combine with a wollP. Thanks to Marijana Marelj for pointing this out.

in (44b)—or, in other words, why future complements always must be vPs as in (44c). The obvious problem for such an approach is that there is no connection between future and case; hence, it is hard to see how an account can connect these two properties and derive the correlation. If future is structurally manifested, on the other hand, there is a connection: the structure, and hence conditions, can be formulated on the way structure is built.

- (44) a. ‘try’ [VP . . .]
 b. *‘plan_{FUT}’ [VP . . .]
 c. ‘plan_{FUT}’ [vP . . .]

To conclude, regarding the restructuring/nonrestructuring distinction, the relation between future and case appears to be a structural relation that can only be expressed if future is represented structurally.

4 Nonfuture Infinitives

In this section, I will discuss infinitives that do not receive a future interpretation, but are interpreted as simultaneous with the matrix predicate. I will argue that there are two types of simultaneous infinitives: propositional attitude infinitives, which impose the *NOW* of the propositional attitude holder as the reference time of the infinitive, and simultaneous infinitives in which the reference time of the infinitive corresponds to the reference time of the matrix predicate. Like future infinitives, both types of simultaneous constructions will be shown to come in control and ECM/raising variants. Since episodic interpretations (eventive predicates) will be used as a central property to distinguish the different classes of infinitives, I first provide an informal account of the distribution of episodic interpretations in finite contexts, followed by a summary of the three types of infinitival constructions as diagnosed by episodic interpretations.

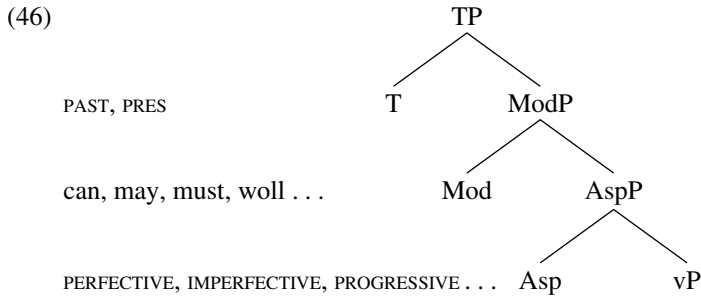
4.1 Episodic Interpretations: An Aspectual Account

In simple clauses, bare (nonprogressive) VPs can receive a nongeneric, nonstative, episodic interpretation in *PAST* and *FUT* contexts, but not in *PRES* contexts. (45a), for example, can only be interpreted as a habitual statement.

- (45) a. Leo sings in the shower (*right now).
 b. Leo sang in the shower yesterday.
 c. Leo will sing in the shower tomorrow.

I propose that the impossibility of (45a) is due to a restriction on *aspect*—specifically, perfective aspect. I cannot give a full formal semantic account of the distribution of episodic interpretations, but I will summarize the main ingredients of such an account (see Todorović 2012a,b for detailed semantic derivations along the lines I will suggest). First, I adopt the common view (see, e.g., Comrie 1981, 1985, Klein 1994, von Stechow 1999, Pancheva 2003, Pancheva and von Stechow 2004) that tenses set up an evaluation/reference time interval relative to the utterance time (in case the tense is the matrix tense) or another evaluation/reference time interval (in case the tense is embedded). Viewpoint aspect, on the other hand, positions the event time interval relative

to the evaluation/reference time interval (see below for more details). The clausal architecture I assume here is given in (46) (since I do not discuss PERFECT in this article, I ignore its controversial status).



A crucial part of my account of the distribution of episodic interpretations will be the contribution of perfective and imperfective aspect. The definitions I will use are given in (47) (from Pancheva and von Stechow 2004). Informally, perfective aspect requires that the event time interval be included in the reference time interval, whereas imperfective aspect requires that the reference time interval be included in the event time interval (see also Klein 1994, Kratzer 1998, and von Stechow 1999 for similar formal proposals along these lines).

- (47) a. $\llbracket \text{IMPERFECTIVE} \rrbracket = \lambda P_{(vt)} . \lambda t_{(i)} . \exists e_{(v)} [t \subseteq \tau(e) \ \& \ P(e)]$
 b. $\llbracket \text{PERFECTIVE} \rrbracket = \lambda P_{(vt)} . \lambda t_{(i)} . \exists e_{(v)} [\tau(e) \subset t \ \& \ P(e)]$

These notions of aspect then exclude perfective aspect in cases where the reference time interval is included in the event time interval. I propose that (im)perfective aspect is projected syntactically in English in nonstative constructions; however, only imperfective aspect is visible morphologically. Specifically, I suggest that in English, progressive morphology must be used in imperfective aspect contexts (i.e., whenever the interpretation is such that the reference time is included in the event time).¹⁹

This is illustrated in (48) and (49). While PAST and FUT allow (nonprogressive) episodic interpretations, this is only possible when the interpretation is such that the event time interval is included in the reference time interval. In examples such as (48a–b), the event time interval (time of singing) is included in the reference time interval (*yesterday* in (48a), *tomorrow* in (48b)) and the conditions of the perfective are thus met. If, on the other hand, the situation is construed as in (49a–b)—that is, in such a way that the past and future reference time intervals are restricted

¹⁹ Note that this does not mean that I assume that *imperfective aspect* and *progressive* are the same elements semantically. Given the modal nature of the English progressive (Dowty 1979, Landman 1992), a *modal progressive* head must be assumed in certain contexts. I leave open whether this modal progressive then occurs in addition to or instead of imperfective aspect. The important point here is that imperfective aspect implies progressive morphology in English (i.e., imperfective aspect is spelled out as *-ing* in English).

Note also that the account to be presented—specifically, the claims that English does also have perfective aspect (which is morphologically not expressed) and that the *-ing* form in English can correspond to imperfective aspect—receives support from Serbo-Croatian (and possibly other languages), which does have productive (im)perfective morphology, and where the distribution of perfective is subject to basically the same restrictions that I will lay out in the text for English. A detailed study of aspect in Serbo-Croatian and an analysis along the lines proposed here is provided in Todorović 2012a,b.

to a short time interval (the time of the mailman's arrival in these cases)—the event time interval (the time of singing) can no longer be included in that reference time interval. Hence, the conditions of perfective are not met in (49a–b), and only imperfective (progressive) can be used. These examples are crucial since they show that it is not simply PAST and FUT that ‘license’ episodic interpretations—rather, the aspectual composition is the determining factor.²⁰

- (48) a. John sang in the shower yesterday.
 b. John will sing in the shower tomorrow.
- (49) a. *John sang in the shower when the mailman arrived. OK if inchoative
 cf. John was singing in the shower when the mailman arrived.
 b. *John will sing in the shower when the mailman arrives. OK if inchoative
 cf. John will be singing in the shower when the mailman arrives.

Returning to (45a), nongeneric present tense statements necessarily yield an interpretation in which the reference time (a short time interval corresponding to the utterance time, the speaker's NOW; see, e.g., Giorgi and Pianesi 1997, Cowper 1998, Ogihara 2007) is included in the event time (the time of singing). Thus, only imperfective aspect is possible, and progressive is obligatory in the present. If the statement is understood habitually (as, for instance, in *Whenever he is happy, John sings in the shower*), there are repeated occurrences of singing events, which are included in a larger reference interval. Thus, in generic statements, the event intervals are included in the reference interval, which eliminates the need for progressive. Finally, I assume here that in stative constructions, (im)perfective aspect is not projected; hence, the verb combines with tense directly, and the aspect distinction is irrelevant for statives.²¹

²⁰ The ungrammaticality of (49a–b) refers to situations in which the mailman's arrival occurs during John's singing. The sentences may be possible under what I will call an inchoative interpretation—that is, an interpretation where John's singing starts after (or at the same time as) the mailman's arrival (e.g., the singing is used as a code or signal to indicate the mailman's arrival).

As discussed in more detail in Todorović 2012a,b, the same effect arises in Serbo-Croatian perfective constructions. Todorović proposes, and I follow her account here, that inchoative interpretations are special cases of aspectual coercion (see de Swart 1998, 2000). According to de Swart, the trigger for such a reinterpretation of an eventuality is a mismatch between the input requirements of an aspectual operator (in our case the reference time for perfective, which has been restricted to a very short interval by the adverbial) and the time of the eventuality (which is a longer interval). Temporal adjustment therefore takes place, reinterpreting the aspectual property of the eventuality to avoid this mismatch. In the cases relevant for our purposes, the repair yields an inchoative interpretation in which aspect is ‘coerced’ to mark the onset of the event (rather than the inclusion of the event time in the reference time interval). Although these interpretations are irrelevant for the account of (im)perfective I develop in this article, they nevertheless support the claim that perfective becomes impossible in PAST contexts and *woll*-contexts when the reference time is restricted to a short interval, since it is only in these cases that the mismatches, and hence the inchoative interpretations, arise.

²¹ This is obviously a simplification. A more refined approach could relate the possibility of simple PRES in statives to the subinterval property of statives (see Ogihara 2007). According to Bennett and Partee (1972), Taylor (1977), and Dowty (1979), statives are defined as sentences that have the *subinterval property*; that is, statives refer to homogenous situations, where the truth of a stative sentence implies the truth of the sentence at every subinterval of the time at which the sentence is true. In contrast to nonstatives, which do not have the subinterval property, a stative event always contains subintervals that are included in the reference time, even in the PRES (assuming the reference time in the PRES is also an interval, albeit a very short one). If perfective is understood with respect to subintervals of a stative event, the availability of a simple PRES with statives could be attributed to the subinterval property.

The last case relevant for current purposes is tense in SOT contexts. Portner (2003) notes an interesting contrast. As shown in (50a), past progressive is possible in both the simultaneous (SOT) and shifted PAST interpretations. However, a bare (nonprogressive) PAST as in (50b) can only refer to the shifted PAST interpretation; the SOT interpretation is excluded. Thus, a deleted PAST behaves like PRES in that it is not compatible with an episodic interpretation.

- | | | |
|---------|--|--------------|
| (50) a. | John said that Mary was reading <i>Middlemarch</i> . | SOT possible |
| b. | John said that Mary read <i>Middlemarch</i> . | *SOT |
| c. | [PAST say [\emptyset was reading/*read]] | SOT |

The contrast in (50) follows from the above assumptions about aspect and the meaning attributed to a deleted tense. Following Heim (1994), Kratzer (1998), and Abusch (2004), I assume that the deleted tense sets up a reference interval in relation to the attitude holder's NOW—the point in time that the attitude holder considers the NOW of the attitude. Like the matrix speech time (the utterance time), I assume that the attitude holder's NOW is a very short time interval. Turning to aspect, embedded perfective aspect imposes the condition that the event time interval (the time of reading) is included in the reference time interval (the attitude holder's NOW). Given that the NOW is a very short time interval, the condition imposed by the perfective cannot be met and the interpretation is excluded. The only way the sentence can be interpreted in an SOT context is to use imperfective aspect instead.

Under the shifted PAST interpretation, on the other hand, the embedded PAST shifts the reference interval to a time before the attitude holder's NOW, which can be an infinitely large time interval, unless it is restricted, for instance, by the addition of an adverbial. In this interpretation, the embedded event time interval (the time of reading) can be included in the reference time interval (the time interval before the attitude holder's NOW).

The examples in (51) further support this analysis. As we saw in (49), a *when*-clause referring to a short time interval restricts the reference time interval, and as a result perfective becomes impossible. The same is the case in (51a). The simultaneous (SOT) interpretation of this example is excluded in exactly the same way as in (50b). The shifted interpretation is excluded, since even though the reference time interval for the embedded aspect is shifted to a time before the attitude holder's NOW, that reference time interval is further restricted by the *when*-clause to a very short time interval (the time of the mailman's knocking). This short reference time interval is incompatible with perfective aspect (the time of reading cannot be included in the reference time interval, the time of the mailman's knocking). Hence, (51a) is ungrammatical. As predicted, (51b) is possible under both interpretations (shifted and SOT), since imperfective requires that the reference time be included in the event time, which is possible in both of these scenarios.

- | | |
|---------|--|
| (51) a. | *John said yesterday that Mary read a week ago when the mailman knocked. |
| b. | John said yesterday that Mary was reading a week ago when the mailman knocked. |

To conclude, I have proposed that the distribution of bare (nonprogressive) episodic VPs in English is determined by restrictions imposed by perfective aspect. In the next section, I will show how episodic interpretations can be used to diagnose the presence or absence of certain temporal elements in infinitives.

4.2 Episodic Interpretations in Infinitives

Given the analysis of episodic interpretations presented in the previous section, one conclusion we can draw regarding future infinitives is that the possibility of episodic interpretations as in (52) does not tell us anything about tense. Given that future infinitives involve a modal component, *woll*, which shifts the reference time to an unspecified time in the future, episodic interpretations are predicted to be possible independently of whether there is tense above the *woll* component or not. Thus, episodic interpretations are predicted to be possible in both control and ECM/raising infinitives, as long as the infinitive is interpreted as a future infinitive (with a nonrestricted reference time; see below).

- (52) a. John decided to sing in the shower.
 b. The copier is expected to break (down) again.

As we have seen in finite future contexts, if the embedded reference time is restricted (by an adverbial) to a short time interval such as 5 p.m. in (53b), the situation changes. I assume that adverbials combine with AspP, and AspP (plus the adverbial) combines with *woll* in a future infinitive. Adverbials such as *at 5 p.m.* restrict the reference time to the time denoted by the adverbial. For the current cases, restricting the reference time to 5 p.m. then has the effect that the event time can no longer be included in the reference time, and the condition of perfective cannot be met. Only imperfective is possible, as in (53c).

- (53) Is John available tomorrow at 5 p.m.?
 a. Probably not. He expects to work tomorrow. ✓ perfective
 b. *I don't think so. He expects to work at 5 p.m. tomorrow. *perfective²²
 c. I don't think so. He expects to be working at 5 p.m. tomorrow. ✓ imperfective

Although episodic interpretations cannot be used to determine whether there is tense in future infinitives, we will see that the distribution of episodic interpretations is nevertheless insightful when we consider simultaneous infinitival constructions. The examples in (54) involve constructions that do not allow a future interpretation for the infinitive, as indicated by the impossibility of future adverbials.²³

²² Examples such as (53b) can again receive an inchoative interpretation (John started to work at 5 p.m.), which for some speakers is easily available. See footnote 20 for an explanation in terms of aspectual coercion. To exclude that reading (although, as pointed out in footnote 20, the existence of aspectual coercion supports the account proposed here according to which a mismatch arises in these contexts), it is important to make sure such examples are understood in a way that the event is an ongoing event starting before the time of the adverbial.

²³ If the infinitive is changed to progressive aspect, a scheduled future interpretation may be available in these cases (see (6e)). However, this interpretation is also available in present tense statements such as *I am leaving tomorrow* and hence provides no evidence for future.

- | | | |
|---------|---|---------|
| (54) a. | *Yesterday, John believed Mary to leave tomorrow. | ECM |
| b. | *Yesterday, John claimed to leave tomorrow. | control |
| c. | *Yesterday, John seemed to leave tomorrow. | raising |

Turning to episodic interpretations, we see that *believe* (ECM) and *claim* (control) do not allow embedded episodic interpretations. Independently of the matrix tense, bare VPs are excluded (see (55a–b), (56a–b)), unless they are stative or generic ((55c), (56c)). The examples are fine when progressive is used ((55d–e), (56d–e)). Thus, regarding the distribution of perfective aspect, these constructions behave like the present tense or SOT contexts discussed in the previous section. (Abusch (2004) also notes the same properties for examples involving subject raising in contexts with passivized matrix predicates such as *asserted*, *confessed*, *known*, *reported*, *said*, *thought*.)

- | | | |
|---------|---|----------------|
| (55) a. | *Leo believes Julia to sing in the shower right now. | *perfective |
| b. | *Leo believed Julia to sing in the shower yesterday. | *perfective |
| c. | Leo believes Julia to like bagels (*tomorrow). | ✓ stative |
| d. | Leo believes Julia to be singing in the shower right now. | ✓ imperfective |
| e. | Leo believed Julia to be singing in the shower yesterday. | ✓ imperfective |
| (56) a. | *Leo claims to sing in the shower right now. | *perfective |
| b. | *Leo claimed to sing in the shower yesterday. | *perfective |
| c. | Leo claims to like bagels (*tomorrow). | ✓ stative |
| d. | Leo claims to be singing in the shower right now. | ✓ imperfective |
| e. | Leo claimed to be singing in the shower yesterday. | ✓ imperfective |

An interesting pattern is found with raising *seem*-constructions. As shown in (57a–b), *seem*-constructions behave like *believe*- and *claim*-constructions when the matrix verb occurs in the present tense: a bare nonprogressive infinitive cannot receive an episodic interpretation; only the imperfective (progressive) form is possible. Crucially, however, when the *matrix* verb occurs in the past tense, bare episodic interpretations suddenly become possible.²⁴ Thus, there is a crucial contrast between (57c), on the one hand, and (55b) and (56b), on the other hand.

- | | | |
|---------|--|----------------|
| (57) a. | *Leo seems to sing in the shower right now. | *perfective |
| b. | Leo seems to be singing in the shower right now. | ✓ imperfective |
| c. | Leo seemed to sing in the shower yesterday. | ✓ perfective |

²⁴ These facts were noticed by Martin (2001), who suggests that *seem*-infinitives are ambiguous between raising, which prohibits episodic interpretations, and control, which allows episodic interpretations. However, as we will see in section 4.4, this assumption cannot be maintained since the same tense contrast holds independently of whether the subject is animate or inanimate.

Table 3

Tense and episodic interpretations

Infinitive	Examples	Episodic interpretations
Future	decide, expect	possible
Simultaneous propositional attitude	believe, claim	impossible
Simultaneous tenseless	seem	dependent on matrix tense

Table 3 summarizes the three types of infinitives. In the next two sections, I will discuss the two classes of simultaneous infinitives and propose an account of the distribution of episodic interpretations based on the restrictions imposed by the matrix predicate.

4.3 Propositional Attitude Infinitives

We have seen that neither propositional ECM nor propositional control infinitives allow episodic interpretations of bare (nonprogressive) infinitives. To account for the simultaneous interpretation and the impossibility of episodic interpretations, one may hypothesize that these infinitives project a *PRES* tense. However, there are at least two reasons to exclude this possibility. First, these simultaneous infinitives clearly differ from finite *PRES* tense counterparts regarding the embedded tense interpretation. A well-known phenomenon of *PRES*-under-*PAST* contexts is the so-called *double access* reading, illustrated in (58a–b). A *PRES* embedded under a *PAST* must refer to a time spanning the higher *PAST* and the utterance time. Given that pregnancies do not take five years, (58a–b) are pragmatically ill-formed. Crucially, the infinitival analogues of these constructions, (58c–d), are perfectly fine; that is, a double access reading is not necessary in these constructions. The lack of a double access reading hence casts doubt on the presence of *PRES* in these infinitives.

- (58) a. #Five years ago, Julia claimed that she is pregnant. double access
 b. #Five years ago, it was believed that Julia is pregnant. double access
 c. Five years ago, Julia claimed to be pregnant. double access not necessary
 d. Five years ago, Julia was believed to be pregnant. double access not necessary

Second, as Ogihara (1996) points out, like future infinitives, these infinitives do not intervene in SOT contexts. As shown in (59), SOT across *claim*- and *believe*-infinitives is possible, which again provides evidence against a *PRES* in these infinitives.²⁵

²⁵ Assuming a deleted *PAST* is not an option here either, since it could not be explained why the *PAST* must always delete, and how this is possible in non-SOT contexts (e.g., *Julia claims to be pregnant* cannot mean ‘Julia claims that she was pregnant’).

- (59) a. A year ago, Mary claimed to know that she was pregnant.
 Mary's claim: "I know I am pregnant now." SOT
- b. A year ago, Leo believed Mary to know that she was pregnant.
 Leo's belief: "Mary knows that she is pregnant now." SOT
- c. PAST claim/believe [_{Inf} Ø INF [~~PAST~~ pregnant]]

The above distribution shows once again that in terms of tense properties, simultaneous control infinitives (*claim*) behave the same as simultaneous ECM (*believe*) infinitives.

Before addressing the question of why episodic interpretations are impossible with bare VPs in these constructions, I return to infinitives combining with *expect*. In section 3, we saw that *expect* can be interpreted as a future infinitive in both the ECM and control variants. In addition to the various versions of *expect* discussed there, *expect*-constructions can have yet another interpretation (though this interpretation is somewhat marked): a simultaneous propositional interpretation. An example is given in (60). The meaning of *expect* corresponds to the 'believe' version of *expect*, and the event described by the infinitive is understood to occur simultaneously with the matrix time. Importantly, in this case, episodic interpretations are impossible.

- (60) Context: I was out with friends last night; my husband was at home then with my son Leo, who usually goes to bed around 8 p.m. Later that evening, my husband asked me what I was doing around 9 p.m. I told him that I was thinking of him and our son, of course. He asked what I thought Leo was doing then, and I replied:
- a. I expected Leo to be sleeping then. simultaneous, ✓ imperfective
- b. *I expected Leo to sleep then. *perfective

The examples in (61) and (62) further illustrate the ambiguity for clear ECM versions of *expect*. The (a) examples involve a (near) future interpretation, and episodic interpretations are possible. The (b) examples, on the other hand, involve the simultaneous 'believe' interpretation, and only imperfective/progressive is possible in the infinitive.²⁶

- (61) a. The bridge is expected to collapse right now. (near) future
 ≈ The bridge is scheduled to collapse now; it will collapse now.
 *People think the bridge is collapsing right now.
- b. The bridge is expected to be collapsing right now. simultaneous
 ≈ People think the bridge is collapsing right now.
- (62) a. The bridge was expected to collapse right then. future
 ≈ The bridge was scheduled to collapse then; they thought it would collapse then.
 *People thought the bridge was collapsing right then.

²⁶ In addition to *expect*, Abusch (2004) lists *anticipate*, *forecast*, *intend*, *mean*, *plan*, *predict*, and *project* as predicates that are compatible with either a future or a simultaneous interpretation. In all these cases, episodic interpretations are only possible in the future interpretations; they are prohibited under the simultaneous construals.

- b. The bridge was expected to be collapsing right then. simultaneous
 ≈ People thought the bridge was collapsing right then.

We have now seen that there are a range of constructions that involve propositional attitude infinitives yielding simultaneous interpretations. The generalization is that in these contexts, the perfective restriction arises: perfective is impossible and only imperfective is allowed. In the relevant cases, the matrix tense was PAST, which shows that the matrix tense does not affect the embedded aspect. Furthermore, we have seen evidence that these infinitives cannot involve a PRES tense. Given the analysis of episodic interpretations developed here, the conclusion is that in propositional attitude infinitives, the conditions of perfective cannot be met—that is, the event time cannot be included in the reference time. The question then is, What is the reference time for the embedded aspect, such that it is impossible for the embedded event time interval to be included in that reference time interval? I propose that propositional attitude verbs impose the restriction that, as in SOT contexts, the reference time for the embedded aspect (the time that the aspect uses to position the embedded event time relative to) corresponds to the NOW of the propositional attitude holder.

To see how this proposal derives the perfective restriction, consider (63) (in part repeated from (55) and (56)). Since the attitude holder's NOW, like the utterance time, is a near-instantaneous interval that cannot include the event time, the conditions for perfective are not met, and episodic interpretations are excluded.

- (63) a. Leo believed Julia to be singing in the shower yesterday. ✓ imperfective
 Leo claimed to be singing in the shower yesterday.
 b. *Leo believed Julia to sing in the shower yesterday. *perfective
 *Leo claimed to sing in the shower yesterday.
 c. believe/claim λn [_{TP} n [_{Asp} *PERFECTIVE/✓ IMPERFECTIVE [_{VP} sing in the shower]]]

Evidence that the reference time is the attitude holder's NOW rather than the matrix event or reference time is provided in (64).²⁷ In the context given, the matrix event time can be an extended time interval. Under this interpretation, the embedded event time would be included in the matrix event time. However, it is not clear in this example whether the embedded event time can be *properly* included in the matrix event time. Assuming the aspect definitions in (47), it should be noted that the definition for perfective aspect states that the event time must be *properly* included in the reference time. Thus, (64) is suggestive but not conclusive.

- (64) Context: John had a written exam from 10 to 12 last Monday, and this was a known fact. From 10 to 12 that day, all his relatives thought anxiously about John, hoping he was doing well.
 a. John was believed to be writing an essay.
 b. *John was believed to write an essay.

²⁷ I thank a reviewer for contributing some of the examples discussed in the text.

I believe, however, that (65) can be used to motivate the claim that the attitude holder's NOW is the crucial interval relevant for the embedded aspect. In the context given in (65), John's parents were mistaken about the time: they held the belief that he was writing a one-hour exam for two hours. In this case, the matrix event time, the actual time of the parents' belief, is then two hours; however, the embedded event time (the time of the exam according to the parents' belief) is only one hour. Thus, the embedded event time would be properly included in the matrix event time, and hence the conditions of perfective would be met if it was the matrix event time that is relevant. As shown in (65), however, a bare (nonprogressive) embedded VP is clearly impossible in such contexts as well. Contexts such as (65) then motivate the claim that the reference time for perfective aspect is not the matrix event or reference time, but the attitude holder's NOW. Since this is a very short interval, the embedded event time cannot be included in the reference time, and perfective is correctly predicted to be impossible.

- (65) Context: John's parents knew that John had a one-hour exam yesterday that was scheduled for 2:00–3:00. At 2:00, they were thinking of him and hoping that things would go well. At 2:30 their clock stopped, for exactly one hour, then started again, but John's parents didn't notice (they don't have a good sense of time). When the clock showed 3:00, they thought the exam ended.
- a. From 2 to 4, John's parents believed John to be writing his one-hour exam.
 - b. *From 2 to 4, John's parents believed John to write his one-hour exam.

In this article, I leave open exactly what the structural consequences of this analysis are. Regarding the syntax of propositional attitude infinitives, Landau (1999, 2000, etc.) and I (Wurmbrand 1998, 2001) have proposed that these infinitives involve a syntactic TP, since partial control is allowed (which according to Landau requires a [+tense] infinitive) and restructuring is prohibited (which, as we saw in section 3.3.2, is expected if those infinitives are tensed). This could be seen as suggestive that the restriction on propositional infinitives—namely, that the attitude holder's NOW functions as the reference time of the embedded predicate—shows a structural reflex. However, I leave the details of such a reflex to future research.

4.4 Tenseless Simultaneous Infinitives

In this section, I will discuss the examples in (66) and propose that these constructions, which do not form an easily definable class, nevertheless can be subsumed under a uniform approach.²⁸ As shown in (66), the relevant constructions include implicative and aspectual verbs, *try*, and *seem*. Following the standard view, nonagentive inanimate subjects like *bridge* in (66b) indicate a raising configuration (see Perlmutter 1970 for *begin*). Thus, these infinitives can also be realized as control or raising infinitives.

²⁸ Since the constructions in this section involve a semantically diverse class of matrix verbs, it is important to keep in mind that these verbs involve different meaning components that may result in distributional differences (*manage* cannot involve an episodic present tense, *seem* is stative, etc.). Although each verb deserves its own special attention, I can only concentrate on the common properties here.

- (66) a. Yesterday, John tried/began . . . /managed . . . to sing (*tomorrow/*next week).
 b. The bridge began/seemed to tremble (*tomorrow/*next week).

Let's start with the question of what these predicates may have in common. First, these constructions do not involve a future interpretation, as shown by the impossibility of future adverbials.²⁹ In the current system, this means that there is no future modal *woll* in these infinitives. Second, we can observe that all predicates in (66) except *seem* are nonpropositional (aspectuals and implicatives are not intensional, and, as mentioned in footnote 29, *try* is irrealis but involves a crucial extensional component; see Pesetsky 1992 among others for the difference between irrealis and propositional complements).³⁰ Thus, in contrast to propositional attitude infinitives, in which a matrix argument (typically the subject) is always understood as the attitude holder of the embedded infinitive, the infinitives in (66) are not (necessarily) attitudes attributed to a matrix argument.

As we will see, this hypothesis has the welcome consequence that these predicates do not impose any restrictions regarding an attitude holder, such as the restriction discussed in the previous section that the reference time of the embedded infinitive corresponds to the attitude holder's NOW. As for *seem*, I will show that infinitives combining with *seem* are ambiguous: they can but do not have to be understood as attitudes attributed to a matrix argument. Crucially, when the statement is understood to involve an attitude holder (which in the case of a *seem*-statement would be the matrix experiencer argument), *seem*-infinitives pattern with propositional attitude contexts regarding their temporal properties.

Note that the propositional attitude contexts discussed in the previous section are different in that the embedded attitude is always attributed to a matrix argument, even in cases where that matrix argument is not present, as in matrix passive contexts (cf. the impossibility of nongeneric episodic interpretations in cases such as *John was believed to *swim/✓ be swimming at 5 p.m.*). This reflects the assumption made in the previous section that with verbs such as *claim* and *believe*, the "selection" of an attitude holder is specified as part of the meaning of the attitude verb and potentially independent of the syntactic presence of an argument corresponding to the attitude holder (however, there are also accounts of passive that assume that the external argument is, in one way or another, syntactically present in passive constructions as well; see Baker, Johnson, and Roberts 1989, Landau 2010, Legate 2010, 2012). Importantly, we will see that *seem* behaves differently in that an attitude holder is optional in both syntax and semantics.

²⁹ In the case of *try*, its irrealis interpretation is often confused with a future interpretation. A convincing account teasing apart the subtleties of the meaning of *try*-constructions is given by Sharvit (2003). Roughly, in *try*-infinitives the embedded event is not realized at the time of trying, but is understood to continue as part of the subject's beliefs (similar to modal readings of the progressive). Sharvit proposes that *try*-constructions involve both an extensional and an intensional component. In contrast to what we find with (intensional) future infinitives such as *decide* and *expect*, there must be an ongoing event (some activity related to the infinitive) in the actual world in *try*-constructions (hence the simultaneous flavor). This event then potentially develops into the event expressed by the infinitive in the subject's relevant accessible worlds.

³⁰ It may be interesting in this respect that *seem*-statements also have received a nonintensional treatment in certain contexts (see Jacobson 2006).

I propose that the infinitives in (66) are truly tenseless, lacking tense and *woll*, and that the matrix predicates impose their reference time as the reference time of the embedded infinitive. As before, I will not provide details about the syntactic structure, but merely note that (a) a structure lacking an embedded TP domain altogether (though potentially including an aspectual projection; see Wurmbrand 2013) is compatible with the tense properties and (b) the predicates in (66) are among the core restructuring predicates crosslinguistically (see Wurmbrand 2001)—that is, as suggested in section 3.3.2, constructions that arguably involve a truncated infinitival structure. The assumption that the reference time of the embedded infinitive corresponds to the matrix reference time accounts for the distribution of episodic interpretations in these contexts. To recap, in (67) ((a) and (b) are repeated from (57)), the availability of embedded episodic predicates depends on the matrix tense. The account is straightforward. If the matrix predicate occurs with present tense, as in (67a,c), the matrix reference time corresponds to the utterance time. Since the embedded event time cannot be included in that reference time, perfective is excluded. The situation is different when the matrix tense is PAST, as in (67b,d). In this case, the matrix event time corresponds to an extended time interval in the past, which is large enough to allow inclusion of the embedded event time interval, meeting the conditions of perfective aspect.

- (67) a. *Leo seems to sing in the shower right now. *perfective
 cf. Leo seems to be singing in the shower right now.
 b. Leo seemed to sing in the shower yesterday. ✓ perfective
 c. *The bridge seems to tremble right now. *perfective
 cf. The bridge seems to be trembling right now.
 d. The bridge seemed to tremble yesterday. ✓ perfective

Furthermore, the account predicts that examples such as (67b,d) should become impossible again when the matrix reference time is restricted—for instance, by adding a time adverbial referring to a short time interval. The examples in (68) show that this is correct. The reference time for embedded aspect is restricted to a short past interval because of the adverbial *at 5 p.m.*, and hence perfective is impossible. As before, the examples may allow an inchoative reading (Leo's singing started at 5 p.m.), which involves aspectual coercion (see footnote 20).

- (68) a. *Leo seemed to sing at 5 p.m. yesterday. OK if inchoative
 b. Leo seemed to be singing at 5 p.m. yesterday.
 c. *The bridge seemed to tremble at 11 a.m. yesterday. OK if inchoative
 d. The bridge seemed to be trembling at 11 a.m. yesterday.

Regarding the other predicates in (66), the account developed here makes the correct predictions with respect to episodic interpretations; however, the dependency on the matrix tense (or rather the matrix event time) cannot be shown in these examples. I nevertheless include a short discussion for completeness. As with *seem*, episodic predicates are possible when the matrix tense is PAST (see (69a)). Since these matrix predicates are not stative, they cannot occur in a bare nonprogressive form in the present (see (69b)), but are only possible with imperfective/progressive as

- (70) Context: John had an exam scheduled for yesterday. The exam is done online and he can take it at home. His parents knew that his exam was yesterday, but they didn't know the exact time. At 2:00, they noticed that the music stopped in John's room and they thought that he might be doing his exam then. At 2:30 their clock stopped, for exactly one hour, then continued, but John's parents didn't notice (they don't have a good sense of time). When the clock showed 3:00, music came on in John's room, and John's parents thought that he did the exam from 2:00 to (what they thought was) 3:00. In reality, John had indeed done his exam from 2:00 to 3:00, but after the exam was finished, he played computer games with his headphones on. Only at 4:00 did he turn the music on again.
- From 2:00 to 4:00 John seemed to his parents to be writing his one-hour exam.
 - *From 2:00 to 4:00 John seemed to his parents to write his one-hour exam.
 - From 2:00 to 4:00 John seemed to be writing his one-hour exam.
 - *From 2:00 to 4:00 John seemed to write his one-hour exam.

These data are interesting since they potentially allow us to predict whether the reference time for the infinitive is the matrix reference time or the attitude holder's *NOW*. In (70a–b), there is an overt experiencer, and that experiencer's false belief about the actual time indicates that the experiencer functions as the attitude holder. The impossibility of perfective in (70b) shows that in such a situation, the reference time of the infinitive is the attitude holder's *NOW*. Importantly, the examples in (70c–d) show the same distribution; however, no overt experiencer is present in these cases. Nevertheless, the only situation in which (70c) can be interpreted is one in which there is a contextually understood argument that holds the belief that the silence in John's room lasted for two hours, when in fact it lasted only one hour. If there is no such experiencer who could hold a false belief, the sentence is uninterpretable. This means that semantically, (70c–d) are like (70a–b) in that the infinitive is attributed to an (understood) attitude holder. The impossibility of (70d) then shows that in this case, too, the reference time of the infinitive is the attitude holder's *NOW* rather than the matrix event or reference time. I therefore hypothesize that the specification of an overt or understood attitude holder is the crucial factor in determining whether the reference time for the embedded event is the matrix reference time (no attitude holder other than the speaker) or, in case an attitude holder is present, that attitude holder's *NOW*.

While I leave open a specific account of this generalization, it is worth noting that a way to derive it would be to assume that there is a structural reflex of the two types of infinitives. If infinitives in which the attitude holder's *NOW* is relevant involve a structural correlate of a temporal argument associated with the attitude *NOW*, that tense element would function as the closest time interval for the embedded aspect and hence would have to be used as the reference time, blocking association of the infinitive with the higher matrix reference time. In cases where I have assumed that the embedding verb imposes the matrix reference time as the reference time for the infinitive, no attitude holder, and hence no tense argument corresponding to an attitude *NOW*, would be present in the infinitive, allowing the association of the infinitive with the higher matrix reference time. Once again, this view would be corroborated by syntactic approaches such as those developed

in Landau 1999, 2000, etc., and Wurmbrand 1998, 2001, where propositional attitude infinitives are considered as tensed whereas the infinitives in (66) are tenseless (or [–tense]).

5 Outlook and Conclusion

In this article, I have proposed that there are three classes of infinitival complements, which differ in their temporal composition: future infinitives are tenseless but involve *woll*, propositional attitude infinitives impose the restriction that the attitude holder's NOW functions as the reference time of the embedded predicate, and simultaneous tenseless infinitives share the reference time with the matrix predicate. The arguments for the three classes of infinitives were based on semantic properties indicating tense and/or aspect, foremost among them the distribution of episodic interpretations, for which I provided an account based on (im)perfective aspect. Importantly, for all constructions, I showed that the temporal properties do not correlate with a control versus ECM/raising difference. The complete picture I have proposed is summarized in table 4.

Comparing the picture I have argued for with the summary provided in section 2, one noticeable difference is that, literally speaking, my account differs from all others in treating future irrealis infinitives as tenseless (however, I do still assume that there is a structural element, the modal *woll*, corresponding to the future meaning). Before offering some extensions and broader consequences of the account provided here, I would like to mention some alternatives to the tenseless structure of future infinitives that I have proposed, which I have set aside so far.

First, following Abusch (2004), it could be assumed that both propositional attitude infinitives and future infinitives involve an additional temporal argument corresponding to the attitude holder's NOW. Such a temporal argument above *woll* in a future infinitive would not have any effect on the distribution of episodic interpretations, since the lower *woll* would work exactly as in tenseless *woll*-infinitives.

Second, as suggested to me by David Pesetsky and a reviewer, the SOT properties of future infinitives discussed in section 3 could also be derived if future infinitives were assumed to involve *either* PRES + *woll* or PAST + *woll*, and if the restriction that *would* involves obligatory

Table 4
Tense properties of English infinitives

Infinitive	Examples	Syntax	Episodic interpretation	Temporal composition of infinitive
Irrealis future	decide, expect expect	control ECM	possible	<i>woll</i>
Propositional	claim believe, expect	control ECM	impossible	reference time is attitude holder's NOW
Nonpropositional; no attitude holder	manage, try begin, seem	control raising	dependent on matrix tense	reference time is matrix reference time

SOT also applied to infinitival PAST + *woll*. Although this alternative would lead to different semantic structures in certain cases, it is unfortunately very difficult to test the predictions that differentiate it from my proposal. One configuration where the two approaches in principle make different predictions was given in (32)–(34). (33) is repeated in (71). As shown in (71c), the view that infinitives are tenseless cannot derive the nonabsolute interpretation of (71a) via SOT, whereas the alternative tense view could assume an SOT analysis for (71a) yielding the relative interpretation. However, as shown in (71d), both approaches run into a problem regarding (71b). That is, both approaches would predict only an absolute interpretation, contrary to fact. This shows that (morphological) present tense behaves “specially” in these contexts (see also Anand and Hacquard 2008 for other contexts where present is interpreted as a relative tense in English), and that whatever is ultimately responsible for deriving the nonabsolute simultaneous interpretation in (71b) would also derive it in (71a).

- (71) a. Last week, the weatherman hoped to announce on Christmas Eve that it is
snowing.
b. Last week, the weatherman hoped that he would announce on Christmas Eve
that it is snowing.
- | | | | | |
|----|--------------------------------|---------------|-------------------|---------------|
| c. | [PAST hope [| woll announce | [PRES snow | no-tense view |
| | [PAST hope [PRES woll announce | [PRES snow | PRES-OR-PAST view | |
| d. | [PAST hope [PAST woll announce | [PRES snow | no-tense view | |
| | [PAST hope [PAST woll announce | [PRES snow | PRES-OR-PAST view | |

Note also that the PRES-OF-PAST view for future infinitives does not translate to propositional attitude infinitives. As I showed in section 4.3, propositional infinitives cannot be assumed to involve a PRES, since infinitives crucially differ from finite present tense contexts. Thus, under this alternative proposal, it would be necessary to also allow infinitives without PRES—specifically, infinitives in which the reference time of the infinitive is associated with the attitude holder’s NOW (either as a restriction imposed by the matrix verb or via an additional tense argument in the infinitive) rather than the utterance time. This then means, however, that in future infinitives there should be yet another option, a structure without a PRES tense but with *woll* (semantically, this would be identical to the PAST + *woll* structure). While this is possible, this account now creates significant redundancies and risks becoming an “anything goes” analysis.

Another context where the two views may make different predictions is given in (72). According to the proposal made in this article, there is only one structure for a sentence like *John decided to leave*, namely, (72a). For the PRES-OR-PAST view, however, there should be two possible structures: a PAST (*would*) structure, as in (72b), which is indistinguishable from the no-tense structure, and a PRES (*will*) structure, as in (72b'). It is this latter structure that may distinguish between the two accounts.

- (72) a. [PAST decide [woll leave]] no-tense view
 b. [PAST decide [PAST woll leave]] PRES-OR-PAST view
 b'. [PAST decide [PRES woll leave]] PRES-OR-PAST view

A well-known property of infinitives is that they receive only a *de se* interpretation (this is typically illustrated regarding PRO (see Chierchia 1989), but is extended to tense in many accounts (see, e.g., Abusch 1997, Schlenker 2003)). For finite future contexts, on the other hand, *de re* interpretations have been proposed. For instance, Ogihara (1996) argues that future-under-past contexts can yield a truth-conditionally distinct double access reading, which he analyzes as a *de re* configuration. If Ogihara's approach is correct, then the PRES-OR-PAST view predicts that future infinitives should allow a *de re* and a *de se* interpretation of infinitival tense, whereas the no-tense view predicts only a *de se* interpretation. Testing this prediction is rather complex, however, and I must leave it for future research.

I will, however, offer one potential piece of theoretical support for the no-tense view and against both alternatives mentioned above. To do so, I will follow the suggestion I provided at the end of sections 4.3 and 4.4, that propositional infinitives are TPs that involve a temporal argument corresponding to the attitude holder's NOW, whereas simultaneous nonattitude infinitives are bare vPs or AspPs (i.e., they include embedded (im)perfective). If these structures can be motivated by further investigation, the resulting system has the following advantages: it involves a direct mapping between syntax and semantics; it is in accordance with syntactic approaches that postulate tense in propositional infinitives (see Landau 1999, 2000, etc., Wurmbbrand 1998, 2001); and, crucially, it allows us to determine the different complementation options via local selection.³² For instance, a verb like *decide* syntactically and semantically selects a future infinitive (i.e., a woliP), whereas a verb like *claim* selects a propositional attitude infinitive (i.e., a TP with an attitude now). In Wurmbbrand 2013, to appear, I develop an account of selection according to which merging two syntactic units is licensed by feature valuation. Specifically, I propose that certain selected elements are underspecified for particular features, which need to be supplied by an element (typically, the selecting element) merging with the underspecified object. This establishes a featural dependency between verbs embedding infinitives and the type of infinitival complement they can combine with, which correctly derives the possible combinations and excludes the impossible ones.

³² These structures may also provide a direction for deriving the distribution of deverbal nominalizations combining with infinitives. According to Pesetsky (1992) and Pesetsky and Torrego (2001, 2004, 2006), infinitives in English can combine with nominalized irrealis predicates, but not with nominalized propositional, implicative, or factive predicates. Looking at other languages, however, we find that infinitives can combine with nominalized propositional predicates; for example, in German, constructions such as (i) are possible.

- (i) sein Glaube, schwach zu sein
 his belief weak to be
 'his belief to be weak'

Similarly, even in English the verb *claim* can occur with an infinitive when nominalized (*John's claim to be weak . . .*). Thus, a purely semantic account does not seem to be sufficient to derive the restrictions on nominalization. One property that does seem to be at work is ECM (note that in languages such as German, ECM does not exist). Once ECM constructions are taken out of the picture (e.g., they are excluded from nominalized infinitival constructions for case reasons), the remaining question is why nominalized implicative predicates cannot combine with infinitives (potentially also factive predicates; I have set aside factive infinitives throughout this article since the empirical distribution is rather controversial and unstable). The classification provided in this article may allow us to approach this question. Implicative infinitives are AspPs, involving perfective aspect, which requires that the infinitival event interval be included in a reference interval. If a reference time interval must be syntactically present for aspect to be computed (whereas tense and modals can be related to a contextually understood time), it would follow that bare AspP infinitives can only be embedded in verbal contexts.

Turning to the two alternatives to the no-tense view mentioned above, the main question raised for these accounts is how the selectional properties can be implemented. The idea that the temporal composition of the infinitive is determined by the higher verb via selection is also proposed by Abusch (2004). Abusch's system is summarized in (73) (= Abusch's (83)). $SUB_1(t, \infty)$ refers to a substitution operator with the interval (t, ∞) , that is, an interval stretching from t (a bound time variable) to infinity. This operator is present in pure future infinitives (such as *promise*) and yields only a future interpretation. $SUB_2[t, \infty)$ refers to a substitution operator with the interval $[t, \infty)$, that is, an interval including the left boundary t . This operator is compatible with both a future and a simultaneous interpretation (such as *predict*, *expect*). For the simultaneous interpretation, an additional time frame adverbial *now*, which can be overt or covert, is necessary to derive the correct interpretation. The SUB operators are thus the crucial elements responsible for a future interpretation. Returning to the question of how it is determined which type of structure can/must combine with which type of infinitive, it is not clear how the relation between the matrix verbs in (73a–b) and the type of SUB operator selected can be implemented. Since Abusch assumes that future infinitives also involve a *contemporary now* above the SUB operators, selection of future infinitives cannot be local.

- (73) a. *promise* $[_{CP} \lambda n [_{IP} n [SUB_1 [_{CP} \lambda n [_{IP} n VP]]]]]$
 b. *predict* $[_{CP} \lambda n [_{IP} n [SUB_2 [_{CP} \lambda n [_{IP} n VP]]]]]$
 c. *believe* $[_{CP} \lambda n [_{IP} n VP]]]$

A similar issue arises for the PRES-OR-PAST view. As shown in (74), since *woll* combines with tense, it is not clear how the matrix verb can “select” *woll* across tense (and, of course, PRES and PAST cannot be assumed to select *woll*, since there are PRES and PAST contexts without *woll*).

- (74) a. *decide* $[_{TP} PRES [_{ModP} woll \dots]]$
 b. *decide* $[_{TP} PAST [_{ModP} woll \dots]]$

For both alternatives, then, the question is how the system can exclude the impossible cases. For instance, what goes wrong with the structures in (75a–b) where *claim* combines with a future infinitive, or with the structures in (75c–d) where *decide* combines with an infinitive without *woll*?

- (75) a. **claim* $[_{TP} PRES/PAST/\emptyset [_{ModP} woll \dots]]$
 b. **claim* $[_{CP} \lambda n [_{IP} n [SUB_1/SUB_2 [_{CP} \lambda n [_{IP} n VP]]]]]$
 c. **decide* $[_{TP} PRES/PAST/\emptyset [_{VP} \dots]]$
 d. **decide* $[_{CP} \lambda n [_{IP} n VP]]]$

In the approach suggested here, verbs like *claim* are specified as requiring a complement including the attitude holder's NOW and hence can only merge with such a TP, whereas verbs like *decide* are specified for a future complement and therefore must merge with a *woll*P.³³

³³ An alternative to the syntactic view of selection given in the text suggested to me by a reviewer would be to assume that verbs requiring a future infinitive select *woll*P, whereas all other infinitive-taking verbs select *vP*/AspP, and that the distinction between propositional and nonpropositional infinitives is purely semantic. Further investigation of the syntactic and semantic properties of nonfuture infinitives is necessary to decide between these two options.

To conclude, the account proposed in this article not only accounts for the (im)possible temporal properties of infinitives, but also allows us to employ a system of local selection that derives which combinations of matrix verbs and different types of infinitives are possible, and which are impossible. While certain claims about the structural composition of infinitival complements are tentative, the strength of the current system is that it covers a very diverse set of infinitival constructions (without ignoring exceptions), it offers a way to account for selectional restrictions of different infinitive-taking predicates, and it allows a unified account of several (partly unrelated) phenomena such as SOT and episodic interpretations.

References

- Abusch, Dorit. 1985. On verbs and time. Doctoral dissertation, University of Massachusetts, Amherst.
- Abusch, Dorit. 1988. Sequence of tense, intensionality, and scope. In *Proceedings of the 7th West Coast Conference on Formal Linguistics*, ed. by Hagit Borer, 1–14. Stanford, CA: CSLI Publications.
- Abusch, Dorit. 1994. Sequence of tense revisited: Two semantic accounts of tense in intensional contexts. In *Ellipsis, tense and questions*, ed. by Hans Kamp, 87–139. Amsterdam: University of Amsterdam, Dyana-2 Esprit Basic Research Project 6852, Deliverable R2.2.B.
- Abusch, Dorit. 1997. Sequence of tense and temporal *de re*. *Linguistics and Philosophy* 20:1–50.
- Abusch, Dorit. 2004. On the temporal composition of infinitives. In *The syntax of time*, ed. by Jacqueline Guéron and Jacqueline Lecarme, 27–53. Cambridge, MA: MIT Press.
- Anand, Pranav, and Valentine Hacquard. 2008. When the present is all in the past. In *Recent advances in the syntax and semantics of tense, mood and aspect*, ed. by Louis de Saussure, Jacques Moeschler, and Genoveva Puskás, 209–228. Berlin: Mouton de Gruyter.
- Bader, Markus, and Tanja Schmid. 2004. The perceptual complexity of intraposed infinitivals. Paper presented at the Workshop on Infinitives (Sonderforschungsbereich 471: Variation and Evolution in the Lexicon), University of Konstanz, Konstanz.
- Baker, Mark, Kyle Johnson, and Ian Roberts. 1989. Passive arguments raised. *Linguistic Inquiry* 20:219–251.
- Baltin, Mark, and Leslie Barrett. 2002. The null content of null Case. Ms., New York University.
- Bennett, Michael, and Barbara Partee. 1972. Toward the logic of tense and aspect in English. Bloomington: Indiana University Linguistics Club.
- Bobaljik, Jonathan David, and Susi Wurmbrand. 2005. The domain of agreement. *Natural Language and Linguistic Theory* 23:809–865.
- Bošković, Željko. 1996. Selection and the categorial status of infinitival complements. *Natural Language and Linguistic Theory* 14:269–304.
- Bošković, Željko. 1997. *The syntax of nonfinite complementation: An economy approach*. Cambridge, MA: MIT Press.
- Bresnan, Joan. 1972. Theory of complementation in English. Doctoral dissertation, MIT, Cambridge, MA.
- Bruening, Benjamin. 2006. Discrepancies between projection and selection: Split coordination and raising to object in Passamaquoddy. Ms., University of Delaware, Newark.
- Chierchia, Gennaro. 1989. Anaphora and attitudes *de se*. In *Semantics and contextual expression*, ed. by Renate Bartsch, Johan van Benthem, and Peter van Emde Boas, 1–32. Dordrecht: Foris.
- Chomsky, Noam. 1981. *Lectures on government and binding*. Dordrecht: Foris.
- Chomsky, Noam, and Howard Lasnik. 1993. Principles and parameters theory. In *Syntax: An international handbook of contemporary research*, ed. by Joachim Jacobs, Arnim von Stechow, Wolfgang Sternefeld, and Theo Vennemann, 506–569. Berlin: Mouton de Gruyter.

- Comrie, Bernard. 1981. On Reichenbach's approach to tense. In *Papers from the 17th Regional Meeting of the Chicago Linguistic Society*, ed. by Roberta A. Hendrick, Carrie S. Masek, and Mary Frances Miller, 24–30. Chicago: University of Chicago, Chicago Linguistic Society.
- Comrie, Bernard. 1985. *Tense*. Cambridge: Cambridge University Press.
- Condoravdi, Cleo. 2001. Temporal interpretation of modals: Modals for the present and for the past. In *Stanford papers on semantics*, ed. by David Beaver, Stefan Kaufmann, Brady Clark, and Luis Casillas, 59–88. Stanford, CA: CSLI Publications.
- Copley, Bridget. 2002. The semantics of the future. Doctoral dissertation, MIT, Cambridge, MA.
- Cowper, Elizabeth. 1998. The simple present in English: A unified treatment. *Studia Linguistica* 52:1–18.
- de Swart, Henriëtte. 1998. Aspect shift and coercion. *Natural Language and Linguistic Theory* 16:347–385.
- de Swart, Henriëtte. 2000. Tense, aspect and coercion in a cross-linguistic perspective. In *Proceedings of the Berkeley Formal Grammar Workshops*, ed. by Miriam Butt and Tracy Holloway King. Available at <http://www.stanford.edu/group/cslipublications/cslipublications/LFG/5/bfg00/bfg00deswart.pdf>.
- Dowty, David. 1979. *Word meaning and Montague Grammar*. Dordrecht: Reidel.
- Dowty, David. 1982. Tenses, time adverbs, and compositional semantic theory. *Linguistics and Philosophy* 9:405–426.
- Enç, Mürvet. 1987. Anchoring conditions for tense. *Linguistic Inquiry* 18:633–657.
- Enç, Mürvet. 1991. On the absence of the present tense morpheme in English. Ms., University of Wisconsin, Madison.
- Enç, Mürvet. 2004. Rethinking past tense. In *The syntax of time*, ed. by Jacqueline Guéron and Jacqueline Lecarme, 203–215. Cambridge, MA: MIT Press.
- Freidin, Robert, and Howard Lasnik. 1981. Disjoint reference and *wh*-trace. *Linguistic Inquiry* 12:39–53.
- Giorgi, Alessandra, and Fabio Pianesi. 1997. *Tense and aspect: From semantics to morphosyntax*. Oxford: Oxford University Press.
- Heim, Irene. 1994. Comments on Abusch's theory of tense. In *Ellipsis, tense and questions*, ed. by Hans Kamp, 143–170. Amsterdam: University of Amsterdam, Dyana-2 Esprit Basic Research Project 6852, Deliverable R2.2.B.
- Hornstein, Norbert. 2003. On control. In *Minimalist syntax*, ed. by Randall Hendrick, 6–81. Oxford: Blackwell.
- Jacobson, Pauline. 2006. I can't seem to figure this out. In *Drawing the boundaries of meaning: Neo-Gricean studies in pragmatics and semantics in honor of Laurence R. Horn*, ed. by Betty J. Birner and Gregory Ward, 157–175. Amsterdam: John Benjamins.
- Katz, Graham. 2001. (A)temporal complements. In *Auditor vox sapientiae*, ed. by Caroline Féry and Wolfgang Sternefeld, 240–258. Berlin: Akademie Verlag.
- Katz, Graham. 2004. The temporal interpretation of finite and non-finite complement clauses of attitude verbs. Ms., University of Osnabrück.
- Kaufmann, Stefan. 2005. Conditional truth and future reference. *Journal of Semantics* 22:231–280.
- Kayne, Richard. 1989. Null subjects and clitic climbing. In *The null subject parameter*, ed. by Osvaldo Jaeggli and Kenneth Safir, 239–261. Dordrecht: Kluwer.
- Klein, Wolfgang. 1994. *Time in language*. London: Routledge.
- Kratzer, Angelika. 1998. More structural analogies between pronouns and tenses. In *Proceedings from Semantics and Linguistic Theory VIII*, ed. by Devon Strolovitch and Aaron Lawson, 92–110. Ithaca, NY: Cornell University, CLC Publications.
- Kusumoto, Kiyomi. 1999. Tense in embedded contexts. Doctoral dissertation, University of Massachusetts, Amherst.
- Landau, Idan. 1999. Elements of control. Doctoral dissertation, MIT, Cambridge, MA.
- Landau, Idan. 2000. *Elements of control: Structure and meaning in infinitival constructions*. Dordrecht: Kluwer.

- Landau, Idan. 2010. The explicit syntax of implicit arguments. *Linguistic Inquiry* 41:357–388.
- Landman, Fred. 1992. The progressive. *Natural Language Semantics* 1:1–32.
- Lasnik, Howard. 1995. Verbal morphology: *Syntactic Structures* meets the Minimalist Program. In *Evolution and revolution in linguistic theory: Essays in honor of Carlos Otero*, ed. by Héctor Campos and Paula Kempchinsky, 251–275. Washington, DC: Georgetown University Press.
- Legate, Julie Anne. 2010. The structure of agents in implicit passives. Paper presented at the 41st annual meeting of the North East Linguistic Society, Philadelphia.
- Legate, Julie Anne. 2012. Subjects in Acehnese and the nature of the passive. *Language* 88:495–525.
- Martin, Roger. 1996. A Minimalist theory of PRO and control. Doctoral dissertation, University of Connecticut, Storrs.
- Martin, Roger. 2001. Null case and the distribution of PRO. *Linguistic Inquiry* 32:141–166.
- Ogihara, Toshiyuki. 1995a. Double-access sentences and reference to states. *Natural Language Semantics* 3:177–210.
- Ogihara, Toshiyuki. 1995b. The semantics of tense in embedded clauses. *Linguistic Inquiry* 26:663–679.
- Ogihara, Toshiyuki. 1996. *Tense, attitude, and scope*. Dordrecht: Kluwer.
- Ogihara, Toshiyuki. 2007. Tense and aspect in truth-conditional semantics. *Lingua* 117:392–418.
- Pancheva, Roumyana. 2003. The aspectual makeup of perfect participles and the interpretations of the perfect. In *Perfect explorations*, ed. by Artemis Alexiadou, Monika Rathert, and Arnim von Stechow, 277–308. Berlin: Mouton de Gruyter.
- Pancheva, Roumyana, and Arnim von Stechow. 2004. On the present perfect puzzle. In *NELS 34*, ed. by Keir Moulton and Matthew Wolf, 469–484. Amherst: University of Massachusetts, Graduate Linguistic Student Association.
- Perlmutter, David. 1970. The two verbs ‘begin’. In *Readings in English transformational grammar*, ed. by Roderick A. Jacobs and Peter S. Rosenbaum, 107–119. Waltham, MA: Ginn.
- Pesetsky, David. 1982. Paths and categories. Doctoral dissertation, MIT, Cambridge, MA.
- Pesetsky, David. 1992. Zero syntax II: An essay on infinitives. Ms., MIT, Cambridge, MA.
- Pesetsky, David, and Esther Torrego. 2001. T-to-C movement: Causes and consequences. In *Ken Hale: A life in language*, ed. by Michael Kenstowicz, 355–426. Cambridge, MA: MIT Press.
- Pesetsky, David, and Esther Torrego. 2004. Tense, case, and the nature of syntactic categories. In *The syntax of time*, ed. by Jacqueline Guéron and Jacqueline Lecarme, 495–537. Cambridge, MA: MIT Press.
- Pesetsky, David, and Esther Torrego. 2006. Probes, goals and syntactic categories. In *Proceedings of the 7th annual Tokyo Conference on Psycholinguistics*, ed. by Yukio Otsu, 25–60. Tokyo: Hituzi Syobo.
- Portner, Paul. 2003. The (temporal) semantics and (modal) pragmatics of the perfect. *Linguistics and Philosophy* 26:459–510.
- Schlenker, Philippe. 1999. Propositional attitudes and indexicality: A cross-categorical approach. Doctoral dissertation, MIT, Cambridge, MA.
- Schlenker, Philippe. 2003. A plea for monsters. *Linguistics and Philosophy* 26:29–120.
- Sharvit, Yael. 2003. Trying to be progressive: The extensionality of try. *Journal of Semantics* 20:403–445.
- Stechow, Arnim von. 1995. On the proper treatment of tense. In *Proceedings from Semantics and Linguistic Theory V*, ed. by Mandy Simons and Teresa Galloway, 362–386. Ithaca, NY: Cornell University, CLC Publications.
- Stechow, Arnim von. 1999. Eine erweiterte Extended Now-Theorie für Perfekt und Futur. *Zeitschrift für Literaturwissenschaft und Linguistik* 113:86–118.
- Stowell, Tim. 1982. The tense of infinitives. *Linguistic Inquiry* 13:561–570.
- Taylor, Barry. 1977. Tense and continuity. *Linguistics and Philosophy* 1:199–220.
- Thomason, Richmond. 1970. Indeterminist time and truth-value gaps. *Theoria* 36:264–281.
- Todorović, Neda. 2012a. On the distribution of perfective aspect in Serbian. In *Proceedings of FASL 21*, ed. by Steven Franks, Mark Dickinson, George Fowler, Melissa Witcombe, and Ksenia Zanon, 373–389. Ann Arbor: Michigan Slavic Publications.

- Todorović, Neda. 2012b. Tense and aspect (in)compatibility in Serbian matrix and subordinate clauses. Ms., University of Connecticut, Storrs.
- Travis, Lisa deMena. 1994. Event phrase and a theory of functional categories. In *Proceedings of the 1994 Annual Conference of the Canadian Linguistic Association*, ed. by Päivi Koskinen, 559–570. Toronto, Ontario: University of Toronto, Toronto Working Papers in Linguistics.
- Travis, Lisa deMena. 2000. The L-syntax/S-syntax boundary: Evidence from Austronesian. In *Formal issues in Austronesian syntax*, ed. by Ileana Paul, Vivianne Phillips, and Lisa deMena Travis, 167–194. Dordrecht: Kluwer.
- Wöllstein-Leisten, Angelika. 2001. *Die Syntax der dritten Konstruktion*. Tübingen: Stauffenburg.
- Wurmbrand, Susi. 1998. Infinitives. Doctoral dissertation, MIT, Cambridge, MA.
- Wurmbrand, Susi. 2001. *Infinitives: Restructuring and clause structure*. Berlin: Mouton de Gruyter.
- Wurmbrand, Susi. 2013. QR and selection: Covert evidence for phasehood. In *NELS 42*, ed. by Stefan Keine and Shayne Sloggett, 619–632. Amherst: University of Massachusetts, Graduate Linguistic Student Association.
- Wurmbrand, Susi. To appear. The Merge Condition: A syntactic approach to selection. In *Minimalism and beyond: Radicalizing the interfaces*, ed. by Peter Kosta, Lilia Schürcks, Steven Franks, and Teodora Radev-Bork. Amsterdam: John Benjamins.

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