

REVIEW ARTICLE OPEN ACCESS

Languages Without Tense

Maziar Toosarvandani 

Linguistics, University of California, Santa Cruz, Santa Cruz, California, USA

Correspondence: Maziar Toosarvandani (mtoosarv@ucsc.edu)**Received:** 21 August 2024 | **Revised:** 17 January 2025 | **Accepted:** 13 May 2025**Keywords:** pragmatics | semantics | theoretical linguistics

ABSTRACT

Within formal semantics, languages with no exponent of tense, or with optional tense, have begun to be incorporated into the theory of temporality only in the last couple decades. This article traces the development of their study, identifying empirical arguments that arbitrate between competing analyses of tenselessness. How future and past reference is established for root clauses, both in information-seeking exchanges and in narratives, requires differentiating at least three types of tenseless languages. Their temporal systems vary in whether they make use of a topic time, distinct from the eventuality and utterance times, and how they do so. While human language seems to allow for some variation in the temporal interpretation of tenseless clauses, it remains to be seen how constrained this variation is.

1 | Introduction

Linguists have known for quite some time that not all languages have a morphological exponent of tense. Only relatively recently have these tenseless languages figured into theorizing about temporality in formal semantics. The focus of earlier work in this tradition—starting with Bennett and Partee (1978), Dowty (1979), Partee (1973), and others—was on languages with tense, mostly European ones. This led to the development of analytical frameworks, influenced by Reichenbach (1947) and Klein (1994), which have been used to approach a range of phenomena in tensed languages. In the last 20 years or so, languages without tense have also been folded in. The same formal tools developed for English, French, Japanese, and Russian have been applied to Blackfoot, Gitksan, Guarani, Halkomelem, Hausa, Kalaallisut, Mandarin Chinese, Navajo, Northern Paiute, Samoan, St'át'imcets, Yucatec Maya, and Zapotec, among other languages.¹

Even more recently, this investigation has grown to include other languages—ones with tense, but which do not use it in every sentence—like Medumba, Tlingit and Washo. These demonstrate that, while linguists have a habit of talking about

tenseless languages, it is really clauses which do or do not have tense.

Two insights have been particularly influential in the study of languages with optional tense or with no tense at all. The first is Matthewson's (2006) hypothesis that tenseless languages may not actually be all that different under the hood, so to speak, from tensed ones. St'át'imcets, she argues, has a tense with familiar semantics; it just happens not to be pronounced. The second insight—apparent only as more tenseless languages have been studied—is that their temporal systems do not all work the same. There is variation, it turns out, in the semantics of tenselessness.

The first development suggests that, to study tenseless languages, we may not have to throw out everything we have learnt from tensed languages. In the neo-Reichenbachian framework for tense and aspect, an animating idea is that sentences are interpreted relative not only to the utterance time, but also a *topic time*. This time—to which 'a speaker's claim on [an] occasion is confined', as Klein (1994, 4) originally put it—is, on one view, retrieved anaphorically by tense (Partee 1973, 1984; Kratzer 1998). If St'át'imcets and other tenseless languages have

This is an open access article under the terms of the [Creative Commons Attribution-NonCommercial-NoDerivs](https://creativecommons.org/licenses/by-nc-nd/4.0/) License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.

© 2025 The Author(s). *Language and Linguistics Compass* published by John Wiley & Sons Ltd.

a silent tense, as Matthewson contends, then making reference to a topic time might be an expressive device which all human languages make use of.

At the same time, a single unified semantic analysis for tenseless languages looks increasingly unlikely. Some are unable to describe a future eventuality without the help of explicit future marking; others are able to do so, though not always in the same linguistic contexts. Tenseless languages also vary in how they describe past eventualities, as well as in how a clause embedded under an attitude predicate is interpreted. These surface differences do not guarantee that the underlying semantics of tenselessness varies. But if, indeed, there is no single way for a language to be without tense, a more sophisticated theory of tenselessness is needed, one which can contribute to determining what temporal systems are possible in human language.

This article will outline the main developments in the investigation of tenseless languages. Section 2 introduces three classes of accounts of tenselessness. While their analytical ingredients differ along several dimensions, I organize them according to how a tenseless clause makes reference to a topic time. In Section 3, I turn to future reference, where the attested variation provides an initial motivation for positing variation in the semantic systems of tenseless languages. Section 4 then addresses past reference, which under some of these accounts is established through distinct interpretive routes. These make different predictions for how narrative sequences can be interpreted, providing another diagnostic for the underlying semantics of tenselessness. Section 5 discusses temporal interpretation inside complement clauses where, too, there is variation across languages, which partially differentiates their underlying semantics. I close in Section 6 by considering what other empirical domains may, in the future, be able to shed light on the theory of tenselessness.

2 | Towards a Theory of Tenselessness

To understand the semantics of a tenseless clause, we have to start with aspect. Only by factoring out its contribution can we see what tense contributes, and what must be filled in through other means when there is none.

Even in tensed languages, a sentence's viewpoint aspect—*perfective* or *imperfective*—and the predicate's lexical semantics contribute to temporally locating an eventuality. In English, for example, a present progressive sentence can describe an episodic event overlapping the speech time (1a), while a simple present sentence containing an eventive predicate cannot (1b).

- (1) a. The child is cutting up the apple.
b. The child cuts up the apple.

This restriction is often attributed to the simple present's viewpoint aspect, which is generally taken to be perfective (Smith 1997, 110, Giorgi and Pianesi 1997, 163).

In the neo-Reichenbachian theory of tense and aspect (Kratzer 1998), perfective aspect locates an eventuality's runtime

(provided by the temporal trace function τ) within some time (2a), while imperfective aspect locates some time properly within the eventuality's runtime (2b).

- (2) a. $\llbracket \text{PRFV vP} \rrbracket = \lambda t \exists e [\llbracket \text{vP} \rrbracket (e) \wedge \tau(e) \subseteq t]$
b. $\llbracket \text{IMPF vP} \rrbracket = \lambda t \exists e [\llbracket \text{vP} \rrbracket (e) \wedge \tau(e) \supset t]$

Tense provides aspect with this time interval. In a referential theory of tense, it does this by anaphorically retrieving a *topic time*. The past tense, as in (3a), presupposes that the topic time precedes the time of the speech situation, represented by the time coordinate of the context (c).

- (3) a. $\llbracket \text{PAST}_i \rrbracket^{s,c} = g(i)$; defined iff $g(i) < \text{TIME}(c)$
b. $\llbracket \text{PRES}_i \rrbracket^{s,c} = g(i)$; defined iff $g(i) \subseteq \text{TIME}(c)$

If the present tense presupposes that the topic time is included in the time of the context, as in (3b), then a simple present sentence will be unable to describe an episodic event, if the speech situation is conceived of as instantaneous (Bennett and Partee 1978, 10; Kamp and Reyle 1993, 536–537; Giorgi and Pianesi 1997, 160; Smith 1997, 110–112).² Perfective aspect requires the event to be included in the topic time, which in turn must be included within the utterance time ($\tau(e) \subseteq g(i) \subseteq \text{TIME}(c)$)—but this is too short to contain an event.³ This does not explain the crosslinguistic variation attested in the interpretation of present perfective sentences, though it is compatible with it. In English, these can only have an habitual reading; but in Russian and other Slavic languages, they can have an episodic reading, as long as the event lies in the future (Grønn and von Stechow 2016, 352).

Returning now to tenseless languages: many, if not all, sentences in the perfective aspect have a past interpretation in an out-of-the-blue context, as shown for Northern Paiute in (4a). When *mino'o* 'now' is added, as in (4b), the event is understood to terminate at the utterance time.⁴

- (4) a. Su=nana t̄i=kaadzi madabbui-hu.
SUBJ=man REFL=car fix-PRFV
'The man fixed his car.'
b. **Mino'o** t̄i=kaadzi madabbui-hu.
now REFL=car fix-PRFV
'He just fixed his car now.'
(Toosarvandani, 2016, 863)

By contrast, an imperfective sentence in the same context has a present interpretation (5a), though adding a temporal adverbial, like *idzi'i* 'yesterday', can shift its interpretation into the past (5b).

- (5) a. Su=nana t̄i=kaadzi madabbui-winni.
SUBJ=man REFL=car fix-PROG
'The man is fixing his car.'
b. **Idzi'i** t̄i=kaadzi madabbui-winni.
yesterday REFL=car fix-PROG
'He was fixing his car yesterday.'
(Toosarvandani, 2016, 863)

The past interpretation for perfective sentences in an out-of-the-blue context has been claimed to have the same source as the restriction on the simple present. If conversational participants conceive of the speech situation as instantaneous, it will be too short to contain an event in its entirety (Smith and Erbaugh 2005; Smith et al. 2007). Only a past interpretation will then be possible, if a future interpretation is ruled out for an independent reason (some possibilities are discussed below). The present interpretation that imperfective sentences have in an out-of-the-blue context, as in (5a), must be explained in some other way. While Smith et al. (2007, 44) attribute it to a pragmatic preference for locating situations at the speech time, it is unclear where this might come from.

Such inferences for tenseless sentences are sometimes referred to as ‘defaults’. But prioritizing out-of-the-blue contexts in this way does not provide any real insight into their semantics, or into the pragmatic principles underlying these inferences. An out-of-the-blue context is simply a very underspecified context, in which conversational participants share few beliefs beyond whatever world knowledge is in the common ground. What is needed is a theory of the conventional meaning of tenseless clauses which, when paired with a theory of pragmatic reasoning, can account for their temporal interpretation in out-of-the-blue—as well as other—contexts.

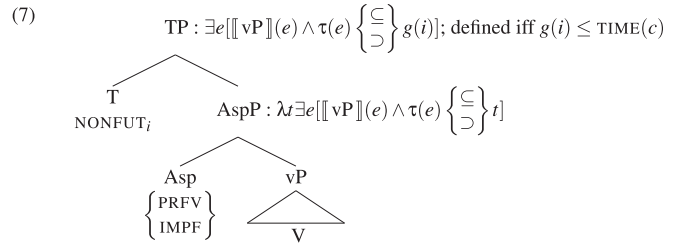
I turn to this theory now. Three broad classes of accounts have been proposed, building on the neo-Reichenbachian analysis of tense. I will start with a semantics for tenseless clauses in which they do, in fact, contain a silent tense that imposes a restriction on the topic time. This will lead, in turn, to a more heterogeneous set of analyses in which tenseless clauses pick out a topic time, though they do not impose a conventional restriction on it. Finally, I will consider a semantics for tenseless clauses in which they do not locate an eventuality relative to a topic time at all.

2.1 | Tenselessness With a Silent Tense

In St’át’imcets, Matthewson (2006) argues that all tenseless clauses contain a tense, albeit a silent one (also see Reis Silva and Matthewson 2007 on Blackfoot, Jóhannsdóttir and Matthewson 2007 on Gitksan, and Cable 2017 on Tlingit). Its presence can only be detected based on its presupposition: the topic time must lie at or before the utterance time.

$$(6) \quad \llbracket \text{NONFUT}_i \rrbracket^{g,c} = g(i); \text{ defined iff } g(i) \leq \text{TIME}(c) \quad (\text{Matthewson, 2006, 680})$$

This silent tense composes just like an overt tense and provides a time argument to aspect. Perfective aspect locates the event time within this time interval; imperfective aspect imposes an inverse temporal relation.



Under this account, tenseless and tensed clauses differ only in their phonology. Matthewson argues that this kind of variation is to be expected if tenses are referential, as pronouns are not pronounced in many languages. The silent tense’s semantic underspecification is similarly expected: third person pronouns also often do not differentiate the gender or other properties of their referent.

2.2 | Tenselessness With Unrestricted Reference to a Topic Time

In the second class of accounts, tenseless clauses are interpreted relative to a topic time, though one whose reference is not restricted.

One example is the analysis proposed for Hausa, Medumba, Northern Paiute, Samoan, Washo, and Zapotec, in which tenseless clauses have a silent tense that can refer, in principle, to any time (Mucha 2013, 2015; Bochnak 2016; Toosarvandani 2016, 2021, 2024; Hohaus 2019).

$$(8) \quad \llbracket \text{TNS}_i \rrbracket^g = g(i)$$

In root contexts, this is semantically equivalent to Tonhauser’s (2011b) analysis of Paraguayan Guaraní, in which a tenseless clause expresses a predicate of times. A semantic rule for matrix clauses saturates this predicate with an anaphorically retrieved topic time.

(9) **Matrix clause rule (after Tonhauser, 2011a, 288):**
A tenseless root clause φ is interpreted relative to a topic time t_i , i.e., $\llbracket \varphi \rrbracket(t_i)$.

I am emphasizing the similarities between these analyses, but there are important differences. With a semantic rule like (9), tenseless clauses may or may not contain a syntactic tense node (T); with a silent tense, there must be one. There are also semantic consequences for how embedded tenseless clauses are interpreted. For now I set these aside, though they will become relevant in Section 5.

This class of accounts, then, takes a tenseless clause to make a claim about an anaphorically retrieved time, just as in Matthewson’s (2006) analysis of St’át’imcets. The only difference with a tensed clause is that reference to a topic time is not semantically restricted.

2.3 | Tenselessness Without a Topic Time

It is possible that tenseless clauses could simply not be interpreted relative to a topic time at all. To my knowledge, not many accounts of this kind have been proposed, though at least one exists. Pancheva and Zubizarreta (2023) advance a theory of tenselessness without a topic time in Paraguayan Guaraní, motivated by recent work on the *narrative present*.

These unexpected uses of the present tense (sometimes also called the historical present) describe eventualities that are not located at the time of utterance. With the semantics for tense above, the sentences in (10) should be contradictions, since they combine present tense with a past time adverbial. To be sure, they cannot describe an event at the utterance time. But when joined with other sentences into a narrative, they can describe a sequence of events located in the past.

- (10) a. My neighbor is mowing the lawn yesterday.
(She waves at me and gestures for me to come over...)
b. On October 24, 1929, the stock market crashes.
(Many rush to the bank to make a withdrawal...)

The narrative present has been integrated into the theory of tense in one of two ways. First, the time coordinate of the context ($\text{TIME}(c)$) might be permitted to diverge from the actual utterance time, potentially creating an improper context (Hornstein 1990, 10–11; Zucchi 2005; Eckardt 2014, 221–225). Second, tenses might be evaluated relative to the time of an additional context—which I call c' —that can diverge from c (Schlenker 2004; Anand and Toosarvandani 2017, 2018).

$$(11) \quad \llbracket \text{PRES}_i \rrbracket^{g,c,c'} = g(i); \text{ defined iff } g(i) \subseteq \text{TIME}(c')$$

With either strategy, a present tense—in languages that have one—will be able to describe eventualities that precede the utterance time.

Pancheva and Zubizarreta (2023) recruit the bicontext to enable tenseless clauses to describe past eventualities, without locating them with respect to a topic time. They propose that, in Paraguayan Guaraní, there is no morpheme or rule which feeds a topic time to aspect (without committing to the presence or absence of a syntactic T node):

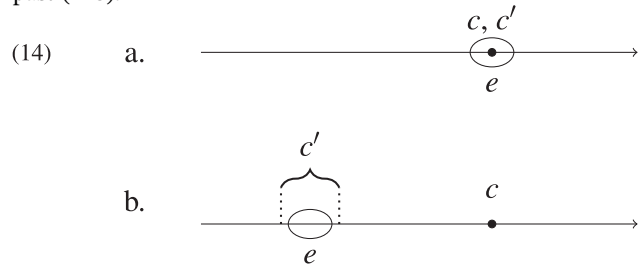
$$(12) \quad \llbracket \text{pro} \llbracket_{\text{TP}} \llbracket_{\text{AspP}} \lambda t \exists e. \llbracket_{\text{VP}} \rrbracket(e) \wedge \tau(e) \left\{ \begin{array}{l} \subseteq \\ \supseteq \end{array} \right\} t \rrbracket \rrbracket$$

Without saying anything more, this would leave a root clause as an unsaturated predicate of times. Pancheva and Zubizarreta assume, following Kusumoto (1999), that there is a pronoun indexical to the time of a context located in the left periphery, which provides a time argument to aspect directly.

$$(13) \quad \llbracket \text{pro} \rrbracket^{g,c,c'} = \text{TIME}(c) \text{ or } \text{TIME}(c')$$

As a result, the time at which a tenseless clause is evaluated is determined entirely by the theory of what c and c' can be.

The two contexts are, as a default, identical. Since c always represents the actual speech situation, an eventuality will be located at the time of utterance if c' is not shifted (14a).⁵ When c' is shifted into the past, an eventuality will be located in the past (14b).



This context shift must be constrained in some way. In a tensed language like English, only in a narrative can the present tense describe a past eventuality, which follows from the principle in (15a). To account for tenseless clauses in Guaraní, Pancheva and Zubizarreta must allow for some variation in how context shift is constrained: it has the somewhat more relaxed setting in (15b).

- (15) a. **Restricted context shift (e.g., in English):**
Shifting the time of c' is restricted to narratives.
b. **Free context shift (e.g., in Paraguayan Guaraní):**
Shifting the time of c' forward is restricted to narratives; shifting it backward is free.
(after Pancheva & Zubizarreta, 2023, 1341)

In other words, Guaraní puts the bicontext to a different use than English. It allows $\text{TIME}(c')$ to shift into the past in any type of discourse, including information-seeking exchanges, not just narratives.

To be explanatory, this hypothesis must be paired with a theory of what counts as a narrative. We can take a narrative to be a sequence of two or more sentences, describing a series of eventualities with some thematic unity (see Lascarides and Asher 1993; Smith 2003; Eckardt 2014; Altshuler 2016; Anand and Toosarvandani 2022). There is no intrinsic correspondence between how these eventualities are structured in the story world—which can be actual or imagined—and how they are described in the narrative. While sentences are ordered entirely by the act of speaking or writing, the events and states they describe can be temporally sequenced in different ways. When there is no lexical material specifying the temporal relation between two sentences, one is inferred by the addressee. Importantly, what constitutes a narrative is independent of tense. The past tense versions of (10a-b) are also narratives, and speakers can move back and forth between present and past tenses in the course of a single narrative, often rapidly (Schiffrin 1981). But the choice of a particular tense can come with affective consequences. Using the present tense in a narrative evokes a sense of vividness or immediacy, a perspective shift which corresponds to a shift of $\text{TIME}(c')$ away from the actual time of utterance in the bicontextual semantics above.

In Pancheva and Zubizarreta's (2023) account, a tenseless language departs more dramatically from a tensed language than in

the two earlier classes of accounts. There is no reference to a topic time distinct from the eventuality and utterance times at all. A formal device—the bicontext—is instead used in a more general way to describe past eventualities.

2.4 | Comparing Accounts of Tenselessness

The differences between these three classes of accounts are summarized below, with each labelled by a letter for convenience (A, B or C):

- (16) a. **A-tenselessness:**
A tenseless root clause contains a silent tense which picks out a topic time, subject to a semantic restriction.
- b. **B-tenselessness:**
A tenseless root clause is interpreted relative to a topic time, which is not semantically restricted.
- c. **C-tenselessness:**
A tenseless root clause is not interpreted relative to a topic time.

They differ based on whether they make reference to a topic time distinct from the utterance or other evaluation time, and if they do, how they do so.

In what follows, I will be comparing these three classes to one another, though the existing accounts do not exhaust the logical space within them. For example, alongside Matthewson’s (2006) account of St’át’imcets with a single silent nonfuture tense, we could imagine a different A-tenseless account with a single silent present tense. This would be quite difficult to discern empirically from Pancheva and Zubizarreta’s (2023) C-account, which uses a silent indexical pronoun to relate an eventuality to the time of a context. These accounts will be easiest to distinguish from one another when a topic time disjoint from the time of a context is appealed to.

Or, we could imagine a C-account like Pancheva and Zubizarreta’s which dispenses with a silent indexical pronoun in the left periphery, closing off aspect’s time argument instead through existential quantification. In such a language, sentences would essentially express atemporal propositions, which must hold at *some* time to be true. Under an account like this, however, we would not expect the range of temporal interpretations for tenseless sentences to be restricted in any way. As we will see in the next sections, while tenseless sentences are indeed more interpretively free than tensed sentences, they are still not completely unconstrained. If this has a semantic source, then any viable C-account will have to appeal to some time parameter.

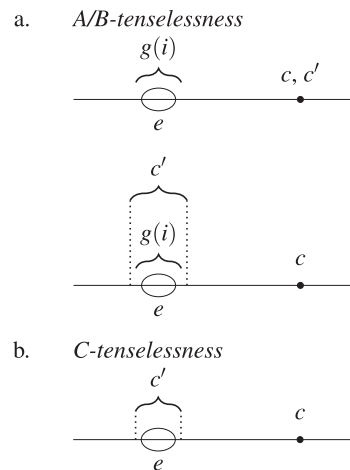
For most languages, just one of these accounts has been advanced. But for the closely related Mbyá and Paraguayan Guaraní languages, both a B-account (Tonhauser 2011b) and a C-account (Pancheva and Zubizarreta 2023) have been proposed.⁶ This suggests we can think about these alternatives in two ways: either as different ways of analyzing tenselessness in general or as different ways that a language might be tenseless. If languages turn out to have different temporal systems in this respect, the theory of tenselessness would have to explain why just these systems are attested.

Can we decide on conceptual grounds what possible languages are allowed? Matthewson (2006, 705–708) argues that a theory that only admits A-tenselessness can help explain how tenselessness comes to be acquired. A child learning St’át’imcets, for instance, must learn that finite clauses cannot describe future eventualities. They will be prepared to do this, she conjectures, if they expect a tense with a semantic restriction in every finite clause, even if one is not pronounced.

This argument is only compelling, Pancheva and Zubizarreta (2023, 1346–1348) point out, if there is no other analysis a child might posit for a tenseless clause. The basic semantics underlying perspective shift in narratives is plausibly universal, since telling stories is a basic human ability. If these mechanics can be used to derive tenselessness, as in their C-account, no child would ever have to posit a tense, unless they received positive evidence for its existence.

For a silent tense, this evidence would have to be interpretative. While a tenseless clause describes the same basic temporal configuration across these accounts—where an eventuality is located in time—the speaker and addressee arrive at this interpretation in different ways. In an A- or B-tenseless system, a past eventuality can be described from the perspective of the speech situation, by finding a topic time anterior to it, or from the perspective of a narrative, when the topic time is located within its temporal extent (17a). By contrast, a C-tenseless system has only one way to describe a past eventuality (17b).

(17) Past reference potentials:



This means that, for A- and B-accounts, a tenseless clause’s interpretation depends in part on the speaker’s referential intentions, evidence for which should be available to the child during acquisition. By age two, children are finely attuned to their social environment, especially adults’ intentions and eye gaze, and they are already mostly adult-like in their ability to track pronominal reference (Moyer et al. 2015). Since there is no reason to think that reference to times is any different than reference to individuals (Schlenker 2006), it seems likely that children will have access to the positive evidence they would need to posit a silent tense in a tenseless clause.

For this reason, excluding any of these accounts just on conceptual grounds seems improbable. Children should be able to

acquire an A- or B-tenseless language or a C-tenseless one. To determine what the theory of tenselessness allows, we will instead have to look for empirical arguments favouring one analysis over another in particular languages.

3 | Referring to the Future

One argument that some clauses are A-tenseless comes from their inability to describe a future eventuality. In St'át'imcets, this is impossible out of the blue, even with a temporal adverbial's help.

- (18) # Táyt-kan natcw/zánucwem.
 hungry-1SG.SUBJ one.day.away/next.year
 Intended: 'I will be hungry tomorrow/next year.'
 (Matthewson, 2006, 677)

This follows directly from Matthewson's (2006) account, in which a tenseless clause contains a silent nonfuture tense.

As we will see below, other languages also exhibit a restriction on future reference in an out-of-the-blue context, though they do not do so in other contexts. While some languages, like St'át'imcets, may indeed be A-tenseless, others cannot be.

3.1 | Some Languages Are Not A-Tenseless

Paraguayan Guaraní does not allow future reference in out-of-the-blue contexts (19). However, as Tonhauser (2011b, 273–274) shows, it does in two other environments: the non-initial clause in a conjunction, when the first conjunct has future marking (20a), and following an adjunct clause introduced by *-re* 'for' containing future marking (20b).

- (19) # Ko'ëro a-jahu.
 tomorrow A1SG-bathe
 Intended: 'Tomorrow, I am going to bathe.'
 (Tonhauser, 2011b, 260)

This precludes an A-tenseless account for Paraguayan Guaraní. If it were A-tenseless, the bare verbs in (20) would contain NONFUT, and so would be restricted to present or past reference.

- (20) a. *Context: Friends are waiting for me in the next city over. I'm running late and call them:*
 A-jahú-ta ha (upéi) a-jupi kolektívo-pe.
 A1SG-bathe-PROSP and then A1SG-get.on bus-at
 'I'm going to shower and then I'll get on the bus.' (Tonhauser, 2011b, 273)
- b. *Context: It's morning and the speaker is talking about a goose walking past her and the addressee.*
 Ja'ú-ta-re ko gánso ko'ëro, a-juka ko ka'arú-pe.
 A1PL.INCL-eat-PROSP-for this goose tomorrow A1SG-kill this afternoon-at
 'Since we are going to eat this goose tomorrow, I will kill it this afternoon.'
 (Tonhauser, 2011b, 274)

Tonhauser (2011b, 274) considers whether this analysis might be rescued by having the future marker in the preceding clause shift the topic time inside these root clauses. This could happen, for instance, if they simply lacked NONFUT, though it would undermine the hypothesis that every tenseless clause contains this silent tense.

3.2 | Constraining Future Reference With B-Tenselessness

Instead, Tonhauser (2011b) argues for a B-account of Paraguayan Guaraní, in which an anaphorically retrieved topic time that is not semantically restricted is introduced by a semantic rule.

Two questions are relevant here. First, what constrains the topic time as a 'default' to a present or past time, producing the infelicity of examples like (19) above, as well as (21) below? Future reference is not even possible when a question in the preceding context makes available a salient time.

- (21) A: Mba'é-pa re-japó-ta ko'ëro dié-pe?
 what-Q A2SG-do-PROSP tomorrow ten-at
 'What are you going to do tomorrow at 10?'
 B: # A-jahu.
 A1SG-bathe
 Intended: 'I am going to bathe.'
 (Tonhauser, 2011b, 259)

Second, what is it about the configurations in (20a-b) that enables the topic time to have future reference? While these are distinct questions, whatever explains why future reference is prohibited in some contexts must be compatible with why it is possible in others.

For the first question, Tonhauser (2011b, 288–293) identifies the need for an appropriate constraint on the topic time's reference. She takes it to be a contextual restriction to a present or past time, though she does not say more about its source.

For a similar restriction in Kalaallisut, Bittner (2011) proposes that certain moods—in particular, what she calls 'fact-oriented' moods—require an event to be a currently verifiable fact: it

must have begun by the speech time in every world in the common ground. For Bittner, not all languages have such moods. But even if they did, a fact-oriented mood cannot account for why future reference is possible in some root clauses (in conjunctions and following certain adjunct clauses). This is, in fact, quite a general problem which any semantic constraint would face.

The alternative is a pragmatic constraint of some kind. Smith et al. (2007, 60) propose one favouring simpler interpretations. In the absence of a future marker, reference to future times is ruled out because it is more complex, due to epistemic uncertainty about the future (see also Mucha 2013, 392). Bochnak (2016, 271) suggests a different principle, which appeals to the indeterminacy of the future (cf. Abusch's (1997) Upper Limit Constraint). While the past is settled, the future is not, and this constrains speakers' ability to refer to times in the future without using a future marker.

A pragmatic constraint may have a hard time explaining crosslinguistic variation in future reference. In Hausa, tenseless clauses can have future reference more freely than in Guaraní or St'át'imcets (Mucha 2013, 386–388). While a temporal adverbial is not enough to shift an eventuality into the future in an out-of-the-blue context (22a), a preceding question can (22b).

- (22) a. # Ta-nà wàsà gòbe.
3SG.F-CONT play tomorrow
Intended: 'She will be playing tomorrow.'
(Mucha, 2013, 386)
- b. A: 'What will Audu and Binta be doing when I come tomorrow morning?'
B: Su-na magana.
3PL-CONT talk
'They will be talking.'
(Mucha, 2013, 388)

Some languages even seem to permit future reference in out-of-the-blue contexts, though there is some disagreement between speakers. In Blackfoot, for instance, Ritter and Wiltschko (2005, 354) describe (23) as having either past or

future reference, though Reis Silva and Matthewson (2007, 202) report that a speaker they consulted rejected a future interpretation.

- (23) Nit-sspiy-ihpinnaan.
1-dance-1PL
'We danced.'
'We are going to dance.'
(Ritter & Wiltschko, 2005, 354)

Similar variation exists in Southeastern Sierra Zapotec. While Sonnenschein (2004, 69) reports that an imperfective sentence can have future reference with an adverbial in the Zoogocho variety (24a), two speakers from the nearby towns of Guiloxi and Yalina report that this is impossible (24b-c).⁷

- (24) a. Chhoh=a' shinh wxe.
IMPF.make=1SG work tomorrow
'I work tomorrow.' (Sonnenschein, 2004, 69)
- b. # Chho¹nh=a^{'3} llinh³ wxe¹.
IMPF.make=1SG work tomorrow
Intended: 'I will work tomorrow.'
(FA, GZY041, 18:36)
- c. # Dzonh¹=a^{'3} llinh³ wxe¹.
IMPF.make=1SG work tomorrow
Intended: 'I will work tomorrow.'
(RM, GZY041, 18:36)

It remains to be seen how this variation might be attributed to a pragmatic principle, if it is grounded in general aspects of human cognition.

For the second question now, why is future reference allowed where it is, which in Paraguayan Guaraní is in the non-initial clause of a conjunction (20a) and root clauses modified by certain adjunct clauses (20b)? Both contexts also enable future reference in Southeastern Sierra Zapotec (25a–b).

- (25) a. We¹shi¹ ne³lla³ y-e¹-l³linh³ Pe¹dro=nh³ lha¹ll=ba^{'3} nha^{'3} xna^{'3}=ba^{'2}
next.week today POT-REP-arrive Pedro=DEF town=3.HU and mother=3.HU
dzu³nh=e^{'1} llinh³ le^{'e³} yi³xe^{'3}.
do.CONT=3.EL work in fields
'Next week today, John will come back to town, and his mother will be working in the fields.'
(RM/FA, GZY076, 54:10)
- b. Ka¹te^{'3} e¹lli³nh=a^{'3} lh³ill³=e^{'1} wxe¹, **dze³-se³-tahs³¹=e^{'1}**.
when arrive.POT=1SG home=3.EL tomorrow, **CONT-PL-sleep=3.EL**
'When I arrive at their house tomorrow, they will be sleeping.'
(RM/FA, GZY065, 50:45)

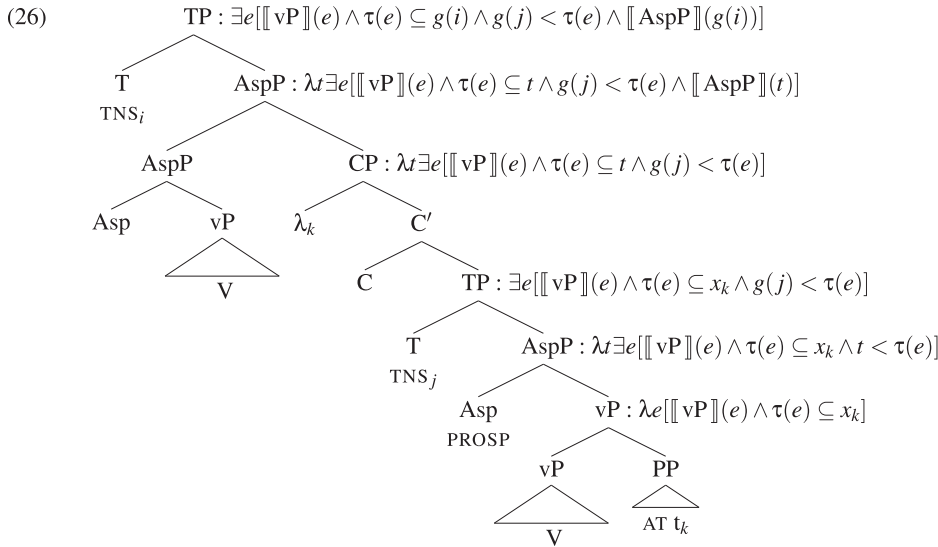
Under a B-account of tenselessness, future shifting by a temporal adjunct clause is perhaps not so unexpected. If the temporal adjunct clause contains operator movement from an adjunct PP, much like a relative clause (Arregui and Kusumoto 1998, 8–9), it will express a predicate of times, as shown in (26) (for simplicity, I show the adjunct clause in final position below):

(27)

Interpretative rule for conjunction:

In a conjunction of sentences S_1 to S_n , if the eventuality time of S_i ($1 \leq i < n$) is temporally located in the future of the utterance time, then the topic time for S_{i+1} is a time shortly after the eventuality time of S_i .

(after Tonhauser, 2011b, 292)



If the adjunct clause contains prospective aspect, it will describe times which overlap the future-shifted event time. By adjoining to the root clause below tense and composing by set intersection, the root clause event can also be future-shifted.⁸

The rule in (27) is striking for its reference to the linear order of conjuncts, which parallels the progression found in narratives. In a narrative, (perfective) sentences are generally interpreted temporally ‘just after’ the immediately preceding (perfective) sentence (Partee 1984; Hinrichs 1986). In Southeastern Sierra Zapotec, for example, a discourse parallel to (25a) without conjunction also permits future reference after the first sentence, as in (28).

For conjunction, Tonhauser (2011b) proposes an interpretative rule, stated in (27), which shifts the topic time for a non-initial conjunct to a time immediately following the event time of the preceding conjunct.

- (28) We¹shi¹ ne³lla³ y-e¹-l¹inh³ Pe¹dro=nh³ lha¹ll=ba³. Xna³=ba²
 next.week today POT-REP-arrive Pedro=DEF town=3.HU mother=3.HU
 dzu³nh=e¹ l¹inh³ le³e³yi³xe³.
 do.CONT=3.EL work in field
 ‘Next week today, John will come back to town. His mother will be working in the fields.’
 (RM/FA, GZY076, 54:10)

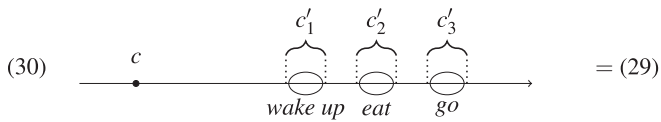
If the pragmatic mechanism responsible for a forward-moving interpretation in narratives is also operative in conjunctions, then an additional rule like (27) is not needed.

3.3 | Enabling Future Reference With C-Tenselessness

In Pancheva and Zubizarreta's (2023) C-account of Paraguayan Guaraní, a special interpretive rule like (27) is also unnecessary. They observe that the clauses in a conjunction can describe future eventualities, even in the absence of a future-marked first conjunct, as long as this is in a narrative (29).

- (29) Context: *Mba'épa ja-japo-ta ko'ërõ?*
 what 1PL.INCL-do-PROSP tomorrow
 'What will we do tomorrow?'
 Ko'ërõ ja-páy la 8, ña-rambosa, ha upéi ja-ha
 tomorrow 1PL.INCL-wake the 8 1PL.INCL-eat.breakfast and then 1PL.INCL-go
 mercádo-pe.
 market-LOC
 'Tomorrow, we wake up at 8, we eat breakfast, and then we go to the market.'
 (Pancheva & Zubizarreta, 2023, 1374)

Under their account, the two contexts are disconnected in (29). Each conjunct is located at the time of c' , which is updated to a future time in the narrative⁹:



Their account can also handle conjunctions in which the first conjunct is future-marked, like (20a): the next conjunct will be located at a $\text{TIME}(c')$ that follows it temporally.

While future narratives like (29) motivate Pancheva and Zubizarreta's C-account, they are not a problem for a B-account. As discussed in Section 2, all languages presumably have the same semantic resources for conveying a narrative. Despite the different LFs posited by the two accounts—(31a) and (31b)—the narrative sequence in (30) could be described in either.

- (31) a. $[\text{TP TNS}_3 [\text{AspP } \lambda t \exists e . \text{wake-up}(e) \wedge \tau(e) \subseteq t]]$
 b. $[\text{TIME}(c') [(\text{TP}) [\text{AspP } \lambda t \exists e . \text{wake-up}(e) \wedge \tau(e) \subseteq t]]]$

- B-tenselessness
 C-tenselessness

In a B-tenseless clause, while the topic time may not be semantically restricted, the speaker's referential intentions can still locate it within the future time of a narrative.

The space between B- and C-tenselessness would narrow even further if context shift was completely unconstrained. This cannot be the case for Guaraní, of course, because a bare clause cannot describe a future eventuality outside of a narrative, for example, (21) above. For languages like Hausa and Blackfoot, which do seem to allow future reference in an information-seeking exchange (22–23), a C-account would be possible if context shift was freely available into the past or future. But then, a principled understanding would be needed for why an eventuality can or cannot be located in the future, just as with a B-account, though this would have to involve a restriction on $\text{TIME}(c')$, rather than the topic time.

In sum, in an A-tenseless language with a silent nonfuture tense, future eventualities can never be described without future marking. However, there are also languages where a tenseless clause can describe a future eventuality. For some, this is more free; for others, it is more restricted. Both B- and C-accounts make this possible, if for somewhat different reasons. As a result, telling them apart solely on these grounds turns out to be quite hard.

4 | Narrative Sequencing and Reference to the Past

The B- and C-accounts of tenselessness do make different predictions about temporal sequencing in narratives, though.

While narratives are generally forward moving, the order of eventuality descriptions does not always mirror the temporal sequence of the elements they describe. In the absence of lexical

material specifying the temporal relations between sentences, they must be inferred. In past tense narratives, both *narrative progression* (32a) and *backshifting* (32b) are possible.

- (32) a. Max stood up. John greeted him.
 b. Max fell. John pushed him.
 (Lascarides & Asher, 1993, 437)

For present tense narratives, however, Anand and Toosarvandani (2018) observe that backshifting is impossible. The present tense analogue of (32b)—*Max falls. John pushes him.*—can only describe a falling event followed by a pushing event. They derive this restriction from constraints on how the additional context (c') in a bicontextual semantics can be shifted in a narrative.

Since Pancheva and Zubizarreta's (2023) C-account only allows for past reference using this mechanism, backshifting should be impossible. This prediction appears to be borne out for Paraguayan Guaraní, though it does not hold for Southeastern Sierra Zapotec (Toosarvandani 2021). Not all tenseless languages, then, can be C-tenseless.

4.1 | Backshifting in Narratives

Pancheva and Zubizarreta identify the following constraints on how the time of the additional context can shift in a narrative (cf. Anand and Toosarvandani 2018, 80):

- (33) **Context shift in narratives:**
- For the first shifted sentence S_1 , the time of c' cannot precede the time of the eventuality described by S_1 , i.e., $\text{TIME}(c') \not\prec \tau(S_1)$.
 - For a subsequent shifted sentence S_2 , the time of c' cannot precede the time of the eventuality described by S_1 .
- (after Pancheva & Zubizarreta, 2023, 1377)

For tensed languages, if the past tense picks out a topic time before the time of c' , then it will be able to backshift a sentence relative to any sentence which locates an eventuality inside $\text{TIME}(c')$. The present tense, by contrast, will not be able to do so, since it picks out a topic time inside $\text{TIME}(c')$.

In Guaraní, eventualities are always located at the evaluation time, which in a narrative is the time of c' , according to Pancheva and Zubizarreta's C-account. This makes it possible to describe an eventuality whose temporal extent is disjoint from the utterance time. But it also predicts that a tenseless sentence in a narrative will not be able to be backshifted. According to the constraint in (33b), when a tenseless sentence is shifted, it will be interpreted at a $\text{TIME}(c')$ which cannot precede the eventuality time of the preceding sentence.

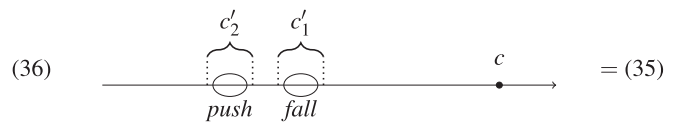
Backshifting is indeed not allowed in Guaraní, which can be seen in future narratives most clearly. The sentences in (34) cannot be understood as a narrative in which the running-over event precedes the dying event.

- (34) *Context: This morning we went to visit a fortune teller. She told us: "Now Kalo is fine. However, ..."*
 ... ko'ērō Kalo o-**mano**. O-**hasa** hi'ári camión.
 tomorrow Kalo 3-**die** 3-**pass** on-top truck
 '... tomorrow Kalo dies. A truck runs him over.'
 (Pancheva & Zubizarreta, 2023, 1378)

For past narratives, the empirical picture is more complicated. Pancheva and Zubizarreta report that 5 out of 10 speakers judged the sequence in (35) to be appropriate in the context provided.

- (35) *Context: Juan likes to bother his sister Maria at school. The teacher explains why she had to punish him.*
 Kuehe, Maria ho-**'a** kyhágui. Juan o-**myaña** chupe.
 yesterday Maria 3-**fall** from-hammock Juan 3-**push** 3SG
 'Yesterday Maria fell from the hammock. Juan pushed her.'
 (Pancheva & Zubizarreta, 2023, 1378)

The judgements of the five speakers who found this sequence unacceptable can be attributed to the unavailability of backshifting in Guaraní. The two sentences cannot form a narrative in which the pushing event is understood to precede the falling event. Since each sentence locates an event at the evaluation time, the only way for the pushing event to precede the falling event would be for $\text{TIME}(c')$ of the second sentence to precede $\text{TIME}(c')$ of the first sentence. However, this configuration, depicted below, is not permitted by the constraint in (33b).



For the other five speakers, Pancheva and Zubizarreta suggest that they may have judged the sequence as acceptable because they understood the two sentences as 'free-standing', and not as part of a coherent narrative. This is a possibility because the principle in (15b) enables context shift in Guaraní into the past for any reason at all. Independent context shift for each sentence is plausible in (35)—but not the fortune teller context in (34)—since the teacher could provide an explanation in two ways: by telling a story about what happened or by making two independent claims, which she may have different sources of knowledge for.¹⁰

Tenseless languages appear to vary in whether they permit backshifting in narratives or not. In Southeastern Sierra Zapotec, spontaneously produced examples of backshifting are attested, and speakers find them unexceptional (Toosarvandani 2021). In (37), for example, the killing (really, attacking) event must temporally precede the agonizing death described by the preceding sentence.

- (37) “Ja-na’=to’ bi’ walhall che=to’ nha=nh’ de nha’. Ba
 AND-see=1PL.EXCL CL hometown of=1.PL.EXCL that=DEF be there already
cheyollhalle’=be’, ba chat=be’, **g-os-ot** bene’ ka’ lebe’.”
 CONT.agonize=3.HU already CONT.die=3.HU COMP-PL-kill people those 3.HU
 “‘We went and saw it was our fellow villager was lying there. He **was** already **in the throes of death**, already dying, because those men **had killed** him.’”
 (Long, 1993, 264)

Only a B-account for Southeastern Sierra Zapotec can explain this pattern of temporal interpretation. If each sentence in (37) refers to a (possibly distinct) topic time, the second sentence can pick out a topic time, located before $\text{TIME}(c')$, which includes the runtime of the agonizing death event.

4.2 | The Future-in-the-Past Restriction

If tenselessness is encoded in different ways in Guaraní and Zapotec—the former amenable to a C-account, and the latter a B-account—different explanations are needed for a restriction that has been observed on *future-in-the-past* readings.

In both languages, future inflection cannot locate an eventuality in the future of a past time freely (Tonhauser 2011a, 217–219, Toosarvandan 2021, Pancheva and Zubizarreta 2023, 1379).

- (38) a. # Kuehe Kalo o-**purahéi-ta**.
 yesterday Kalo 3SG-**sing-FUT**
 Intended: ‘Kalo **was going to sing** yesterday.’
 (Pancheva & Zubizarreta, 2023, 1379)
- b. # Ne³je¹ **gul**¹ Pe¹dro=nh³.
 yesterday **FUT.sing** Pedro=DEF
 Intended: ‘Pedro **was going to sing** yesterday.’
 (RM/FA, GZYZ028, 7:57)

A similar restriction has been identified in other tenseless languages, including Gitxsan (Jóhannsdóttir and Matthewson 2007, 306, fn. 5), Hausa (Mucha 2015, 82–83), Medumba (Mucha 2015, 169–170), and St’át’imcets (Matthewson 2006, 691–692).

Tonhauser (Tonhauser 2011a, 222) proposes that, in a B-account, this restriction arises in part from the semantics of the future marker. As shown in (39), she takes *-ta* in Guaraní to encode a future-oriented modal (either epistemic or circumstantial), whose domain is determined by the world of evaluation (w_0) and a contextually salient topic time. The modal’s prejacent is evaluated at a time in the future of the topic time (which, in the modified entry in (39), is provided by a silent tense).

- (39) $\llbracket \text{TNS}_i \text{ VP-ta} \rrbracket^g = \forall w' : w' \in \text{max}_h(w_0, g(i)) (\cap f(w_0, g(i))) \exists t' : g(i) < t' \llbracket \llbracket \text{VP} \rrbracket(w')(t') \rrbracket$

With this semantics, (38a) is predicted to be a contradiction, assuming: (i) the contextually salient topic time is resolved to the utterance time (see Section 3) and (ii) the temporal adverbial takes scope under the modal, either by constraining the shifted time or the eventuality time.

But this predicts that when no past temporal adverbial is present, no contradiction should arise, and so a future-in-the-past reading should be possible, as long as a contextually salient past topic time can be found. This is in fact possible in the non-initial clauses of a narrative.

- (40) *Context: The mother received a call from the school that her daughter had had an accident at school and was now at the hospital. The teacher told her to come to a particular road crossing.*
 Upépeve o-guerú-**ta** chupe la i-profesor.
 there A3-bring-FUT 3.ACC the B3-teacher
 ‘Her teacher **would/was going to** bring her there.’
 (Tonhauser, 2011a, 217)

From this perspective, whether a future-in-the-past reading is possible actually comes down to how the topic time is resolved. This, in turn, requires some theory of when the topic time can be located in the past.

In the absence of such a theory, Pancheva and Zubizarreta (2023, 1379–1381) take the availability of future-in-the-past readings in narratives to be an argument against a B-account of Guaraní, and in favour of a C-account instead. The restriction in out-of-the-blue contexts follows, for them, from a constraint on context shift in free-standing clauses. This constraint is stated independently in (41), though Pancheva and Zubizarreta collapse it with the narrative startup constraint in (33a) above.

- (41) **Context shift in free-standing clauses:**
 For a sentence S_0 , the time of c' cannot precede the time of the eventuality described by S_0 , i.e., $\text{TIME}(c') \not< \tau(S_0)$.

In a free-standing clause, a future-in-the-past reading is prohibited because it would locate an eventuality after $\text{TIME}(c')$. A future-in-the-past reading is possible in a narrative, as in (40), because the constraint in (33b) comes into play instead. This is satisfied as long as $\text{TIME}(c')$ is updated to a time that does not precede the eventuality time of the preceding, future-marked sentence.

Under an A- or B-account, however, the future-in-the-past restriction need not find its source in how the topic time is resolved at all. In Southeastern Sierra Zapotec, future marking can only locate an eventuality after a past time in the complement of an attitude predicate (42a), not a relative clause (42b).

- (42) a. $\text{Go}^3\text{shyi}^3 \text{gokd}^3 \quad \text{Pe}^1\text{dro}=\text{nh}^3 \text{[gak}^1 \quad \text{zahg}^3 \text{ne}^3\text{je}^1]$.
last.week COMP.think Pedro=DEF **FUT.happen** cold yesterday
'Last week, Pedro thought it **would be cold** yesterday.'
(RM/FA, GZYZ081, 12:30)
- b. $\# \text{Go}^3\text{shyi}^3 \text{bzi}^3 \text{i}^3 \quad \text{Pe}^1\text{dro}=\text{nh}^3 \text{[ba}^1\text{ke}^1=\text{nh}^3 \text{e}^1\text{xhonj}=\text{b}^1\text{ne}^3\text{je}^1]$.
last.week COMP.buy Pedro=DEF cow=DEF **FUT.run**=3.AN yesterday
'Last week, Pedro bought the cow that **would run away** yesterday.'
(RM/FA, GZYZ081, 8:00)

This parallels the behaviour of epistemic modals in English, whose temporal perspective cannot be shifted outside of attitude contexts (Abusch 1997, 23). For this reason, their modal base and ordering source are often taken to be interpreted at the local evaluation time, either by taking scope over tense or under a special null tense that must be bound (see Rullmann and Matthewson 2018 for discussion). A parallel analysis is possible for future marking in Zapotec, as in (43) (Toosarvandani 2021).

- (43) $\llbracket \text{FUT VP} \rrbracket^{c,c',g} = \forall w' : w' \in \text{max}_h(w_0, t_0) (\cap f(w_0, t_0)) \exists t' : t_0 < t' \llbracket \text{VP} \rrbracket(w')(t')$

In attitude contexts, the local evaluation time is provided by the attitude predicate; elsewhere, it is provided by the additional context (c'). A future-in-the-past reading is impossible in a relative clause then, because of the more restrictive setting for context shifting in (15a). This correctly predicts that a future-in-the-past reading should become possible in a relative clause, as long as it is part of a narrative (and not used on its own in an information-seeking exchange), as shown by (44).

- (44) *Context: 'Last year, Maria came to Laxopa for the fiesta. It was her first time. She took a walk around the town. She visited the church.'*
 $\text{Nha}^3 \text{ja}^1\text{-na}^3\text{le}^1=\text{ba}^2 \quad \text{go}^3\text{on}^1\text{[ye}^1\text{-se}^1\text{-e}^3\text{-xhi}^1=\text{e}^1 \text{llah}^3 \text{yo}^3\text{ble}^1]$.
then COMP.AND-visit=3.HU bull **FUT-PL-ride**=3.EL day next
'She visited [the bull they **would ride** the next day].'
(RM, GZYZ086, 44:00)

Since the time of c' is shifted into the past in the narrative in (44), the riding event can be located in the future of this past time, even though it is outside an attitude context.

Not all tenseless languages can be C-tenseless, then. In those which allow backshifting in narratives, a tenseless clause must refer to a topic time, as in an A- or B-account. This freedom comes at cost, though, as they also exhibit the past-in-the future restriction. Since free reference to a topic time enables both past reference and backshifting, some explanation is needed for why a future-marked clause cannot take past perspective outside of narratives. In a C-tenseless language, by contrast, the unavailability of backshifting and a future-in-past reading could have

the same source, in the more restricted mechanism by which past reference arises.

5 | Temporal Interpretation in Embedded Clauses

So far, we have been focused on the temporal interpretation of root clauses. However, embedded contexts—complements of attitude predicates, relative clauses, temporal adjunct clauses—

are all important testing grounds for theories of tense (see Ogihara and Sharvit 2012; von Stechow and Grønn 2013a, 2013b for recent surveys). This should be true for theories of tenselessness, too, though only recently have they begun to be explored in this connection. There is some variation in how attitude complements are interpreted in languages without tense or with optional tense, which partially differentiates the existing accounts of tenselessness.

First, a bit of background on tense in embedded clauses. In English, a language with sequence of tense, a past tense clause embedded under a past tense attitude predicate, like (45), has two readings. The embedded clause can either describe an eventuality located at the attitude holder's now (a 'simultaneous' reading) or anterior to it (a 'shifted' reading).¹¹

- (45) Finn believed he was ill.
- $[_{TP} PAST_i V [\lambda_{w_0} \lambda_{t_0} [_{TP} PAST_0 V]]]$
 - $[_{TP} PAST_i V [\lambda_{w_0} \lambda_{t_0} \exists_j [_{TP} PAST_{0,j} V]]]$
 - $[_{TP} PAST_i [V-PAST_j] [\lambda_{w_0} \lambda_j [_{TP} t_j V]]]$

In Abusch's (1997) theory of embedded tense, a simultaneous reading is produced by 'deleting' the embedded tense and abstracting over it (see Ogihara and Sharvit 2012 for a review of this and competing approaches). The result is the *de se* LF in (45a), in which a temporal property is ascribed to the attitude holder's now. When the embedded tense is not deleted, two LFs are possible. In one, (45b), the tense's evaluation time is bound, resulting in a shifted reading. In the other, (45c), the embedded tense undergoes *res*-movement (Heim 1994). With this LF, a temporal property is ascribed to the moved tense ($PAST_j$) under a suitable acquaintance relation, which may locate it either at or before the attitude holder's now.

Note that, with the LF in (45a), the embedded past clause actually ends up being C-tenseless, as it is not interpreted relative to a topic time.¹² According to Pancheva and Zubizarreta's (2023) account, attitude complements in C-tenseless languages should only have a simultaneous reading, assuming that the temporal indexical pronoun is only found in the left periphery of root clauses.

- (46) $[_{TIME}(c') [_{TP} V [\lambda_{w_0} [_{TP} V]]]]$

This turns out, in fact, to be true for Guaraní (Tonhauser 2011b, 275; Thomas 2014, 363–364; Pancheva and Zubizarreta 2023, 1364–1368).

- (48) a. $[_{TP} TNS_i V [\lambda_{w_0} \lambda_{t_0} [_{TP} TNS_0 V]]]$
 b. $[_{TP} TNS_i [V-TNS_j] [\lambda_{w_0} \lambda_j [_{TP} t_j V]]]$

Existing A-accounts and some—though not all—B-accounts make a different prediction. In Tonhauser's theory of Guaraní, an anaphoric topic time is introduced by a semantic rule only in root clauses. For her, embedded clauses would denote a temporal property, just as in Pancheva and Zubizarreta's theory. However, in Matthewson (2006) account of St'át'imcets, as well as in any B-account with a silent pronominal tense, this is not the case. While a shifted reading with an LF like (45b) will not be possible, we might expect this silent tense to be

able to be construed *de re*, giving rise to a shifted reading in that way.

Bochnak et al. (2019) show that, for at least some tenseless languages, this is the case. In Hausa, an embedded tenseless clause can describe an eventuality located either at the attitude

- (simultaneous)
 (shifted)
 (simultaneous or shifted)

holder's now (the 'simultaneous' reading), as in the context in (47a), or before it (the 'shifted' reading), as in the context in (47b).

- (47) a. *Context: 'Audu, you met Binta and Hawwa yesterday, how were they doing?'* (simultaneous)
 b. *Context: 'Audu, you met Binta and Hawwa yesterday. Did they tell you why they were in such a bad mood last week?'* (shifted)
 Hãwwa dà Binta sun cê [sun gàji].
 Hawwa and Binta 3PL.PRFV say 3PL.PRFV be.tired
 'Hãwwa and Binta said that they were tired.'
 (Bochnak et al., 2019, 436–437)

Tenseless complement clauses in Washo, a language with optional past tense, pattern the same way. At the same time, Bochnak et al. identify Samoan as another tenseless language, alongside Guaraní, that only permits a simultaneous reading.

Bochnak et al. propose a way to capture this variation within a referential B-account of tenselessness.¹³ Since the silent tense comes with no restriction on its reference, when it is bound in an embedded clause, as in the LF in (48a), the result is just a simultaneous reading. A shifted reading is possible in Hausa and Washo, because the silent tense can be construed *de re*, as in (48b).

In Samoan, which Bochnak et al. maintain is B-tenseless, only a simultaneous reading is possible, then, because *res*-movement is not available as freely as in other languages. They draw a parallel between this variation and variation in other types of covert movement, such as quantifier raising.

The interpretation of attitude complements can distinguish between the main accounts of tenselessness, though only sometimes. If a language has both simultaneous and shifted readings,

then it cannot be C-tenseless. Some mechanism is needed for generating both, which Bochnak et al. argue involves *res*-movement. However, if a language only allows a simultaneous reading, the complement clause could in principle be either A/B-tenseless or C-tenseless, assuming the mechanism for *de re* construal is subject to crosslinguistic variation.

6 | Conclusion

There seems, then, to be no one way for a language to be without tense. While some do not allow a tenseless clause to have future reference, others do, albeit only in limited linguistic contexts. The former, like St'át'imcets, have been argued to be subject to an analysis in which a silent tense refers to a nonfuture topic time (what I have called A-tenselessness). A different empirical property differentiates languages that do permit future reference. Southeastern Sierra Zapotec allows backshifting in narratives, something which should only be possible if tenseless sentences in the language can refer to a topic time located before the now of the speech situation or narrative (B-tenselessness). By contrast, Paraguayan Guaraní has been claimed to disallow backshifting altogether. If true, this would follow from the language not making reference to a topic time at all (C-tenselessness).

The temporal interpretation of complement clauses is more equivocal, and only sometimes seems to differentiate between A/B- and C-tenselessness. For languages which only permit a simultaneous reading, this might be attributed either to their lacking reference to a topic time or to their having more restricted access to a *res*-movement operation.

While the study of tenseless languages has come a long way, much empirical ground remains to be covered. There are other temporal phenomena besides those discussed here, whose semantics make reference to the same meaning components implicated in the semantics of tenselessness. A topic time has been appealed to not only in the semantics of tense, but also in the semantics of temporal adverbials and temporal adjunct clauses. Similarly, the interpretations of temporal demonstratives as well as certain temporal adverbials and adjunct clauses make reference to the evaluation time, whose contextual shift enables C-tenselessness. What these phenomena may reveal about the theory of tenselessness by and large remains to be seen.

Acknowledgements

I would like to thank Raúl Díaz, Fe Silva Robles, and two other speakers of Zapotec for teaching me about their language. I am also grateful to two anonymous reviewers and to Professor Jesse Harris for their generous comments, which have greatly improved the article. It has also benefited from questions and suggestions from Roumi Pancheva, as well as from audiences at WCCFL 37 and SULA 12. This material is based on work supported by the Committee on Research from the University of California, Santa Cruz.

Endnotes

¹ Some relevant references: Blackfoot (Ritter and Wiltschko 2005; Reis Silva and Matthewson 2007), Gitksan (Jóhannsdóttir and Matthewson 2007; Aonuki 2021), Guaraní (Tonhauser 2011b; Thomas 2014;

Pancheva and Zubizarreta 2020, 2023), Halkomelem (Ritter and Wiltschko 2005), Hausa (Mucha 2013), Kalaallisut (Shaer 2003; Bittner 2005, 2011), Mandarin Chinese (Lin 2003, 2006, 2012; Smith and Erbaugh 2005), Medumba (Mucha 2015), Navajo (Smith et al. 2007), Northern Paiute (Toosarvandani 2016), Samoan (Hohaus 2019), St'át'imcets (Matthewson 2006), Tlingit (Cable 2017), Washo (Bochnak 2016), Yucatec Maya (Bohnemeyer 2002, 2003, 2009), Zapotec (Toosarvandani 2021, 2024; Plumb 2024).

² It must be short enough not to temporally contain a punctual event, though not so short so as to preclude overlap with a stative eventuality.

³ Alternatively, Ogihara (2007, 400) attributes this restriction entirely to the semantics for present tense, if it requires a sentence to hold throughout the utterance time (by holding at every subinterval of the utterance time). This would not offer an explanation for why a perfective sentence in tenseless languages cannot have a present interpretation.

⁴ In some tenseless languages, the perfective aspect is simply incompatible with 'now', for example, Blackfoot (Reis Silva and Matthewson 2007, 201).

⁵ With this default, *pro* may not need the disjunctive denotation in (13) for *pro*: it could just pick out the time of *c'*.

⁶ Thomas (2014) advances what might even be considered an A-account of Guaraní. For him, tenseless clauses are interpreted relative to a non-future topic time, though this is provided by an 'adverb'.

⁷ The original Southeastern Sierra Zapotec data reported in this article comes from meetings with four adult speakers living in the large diaspora community in California. All four learnt Zapotec as their first language and moved to the United States as adults. I have been working with three of the speakers continuously since 2016 and the fourth starting in 2022. Our (bi)weekly meetings took place with Spanish as the intermediate language and remotely by Zoom in 2020–2021. All Zapotec data from other sources has been orthographically normalized and morphologically reanalyzed.

⁸ Tonhauser (2011b, 273, fn. 12) observes that purely temporal adjunct clauses, with *-rire* 'after' and *-vove* 'when', do not have this ability. This contrasts with Southeastern Sierra Zapotec, as shown in (25b), where even a temporal adjunct clause with *kate'* 'when' does. In addition, the Guaraní example in (20b) can have a futurate reading involving a plan (Roumyana Pancheva, p.c.), while the Zapotec example in (25b) may not.

⁹ There is a question of whether narrative progression is derived entirely from shifting the time of the additional context forward or not. For Anand and Toosarvandani (2018, 84–87), narrative progression is the product of an independent pragmatic mechanism, and they accordingly do not require $\text{TIME}(c')$ to be updated for each sentence.

¹⁰ In support of this analysis, Pancheva and Zubizarreta (2023, 1378, fn. 49) observe that when the indirect evidential *ra'e* is added to the second sentence in (35), 8 out of 10 speakers judged it as acceptable. By explicitly signalling that the pushing event was reported or inferred, the evidential facilitates a free-standing interpretation for the two sentences.

¹¹ We are only looking at stative descriptions in the embedded clause, since eventive descriptions (in the perfective) cannot have the simultaneous reading (Gennari 2003).

¹² There are other C-tenseless embedded clauses in tensed languages, including at least some infinitival complements (Wurmbrand 2014).

¹³ Since Bochnak et al. assume that the temporal interpretation of the embedded clause is subject to the Upper Limit Constraint (Abusch 1997), their account is also compatible with A-tenselessness. An embedded nonfuture tense would give rise to the exact same readings as the LFs in (48), since the embedded clause independently cannot be located in the future of the attitude holder's now.

References

- Abusch, D. 1997. "Sequence of Tense and Temporal De Re." *Linguistics and Philosophy* 20: 1–50. <https://doi.org/10.1023/a:1005331423820>.
- Altshuler, D. 2016. *Events, States, and Times: An Essay on Narrative Discourse in English*. De Gruyter Mouton.
- Anand, P., and M. Toosarvandani. 2017. "Unifying the Canonical, Historical, and Play-By-Play Present." *Sinn und Bedeutung* 21: 19–34.
- Anand, P., and M. Toosarvandani. 2018. "No Explanation for the Historical Present: Temporal Sequencing and Discourse." *Sinn und Bedeutung* 22: 73–90. <https://doi.org/10.21248/zaspil.60.2018.455>.
- Anand, P., and M. Toosarvandani. 2022. "Narrative and Point of View." In *Linguistics Meets Philosophy*, edited by D. Altshuler, 176–213. Cambridge University Press.
- Aonuki, Y. 2021. "Relative Pronominal Tense: Evidence From Gitksan, Japanese, and English." Unpublished Master's thesis, University of British Columbia.
- Arregui, A., and K. Kusumoto. 1998. "Tense in Temporal Adjunct Clauses." *Semantics and Linguistic Theory (SALT)* 8: 1–18. <https://doi.org/10.3765/salt.v0i0.2814>.
- Bennett, M., and B. H. Partee. 1978. *Toward the Logic of Tense and Aspect in English*. Indiana University Linguistics Club.
- Bittner, M. 2005. "Future Discourse in a Tenseless Language." *Journal of Semantics* 22, no. 4: 339–387. <https://doi.org/10.1093/jos/ffh029>.
- Bittner, M. 2011. "Time and Modality Without Tense or Modals." In *Tense Across Languages*, edited by R. Musan and M. Rathert, 147–188. Walter de Gruyter.
- Bochnak, M. R. 2016. "Past Time Reference in a Language With Optional Tense." *Linguistics and Philosophy* 39, no. 4: 247–294. <https://doi.org/10.1007/s10988-016-9191-6>.
- Bochnak, M. R., V. Hohaus, and A. Mucha. 2019. "Variation in Tense and Aspect, and the Temporal Interpretation of Complement Clauses." *Journal of Semantics* 36, no. 3: 407–452. <https://doi.org/10.1093/jos/ffz008>.
- Bohnenmeyer, J. 2002. *The Grammar of Time Reference in Yukatek Maya*. Lincoln.
- Bohnenmeyer, J. 2003. "Invisible Time Lines in the Fabric of Events: Temporal Coherence in Yucatec Narratives." *Journal of Linguistic Anthropology* 13, no. 2: 139–162. <https://doi.org/10.1525/jlin.2003.13.2.139>.
- Bohnenmeyer, J. 2009. "Temporal Anaphora in a Tenseless Language." In *The Expression of Time*, edited by W. Klein and P. Li, 83–128. De Gruyter.
- Cable, S. 2017. "The Implicatures of Optional Past Tense in Tlingit and the Implications for 'Discontinuous Past'." *Natural Language & Linguistic Theory* 35, no. 3: 635–685. <https://doi.org/10.1007/s11049-016-9355-7>.
- Dowty, D. 1979. *Word Meaning and Montague Grammar*. Kluwer.
- Eckardt, R. 2014. *The Semantics of Free Indirect Discourse: How Texts Allow Us to Mind-Read and Eavesdrop*. Brill.
- Gennari, S. 2003. "Tense Meanings and Temporal Interpretation." *Journal of Semantics* 20, no. 1: 35–71. <https://doi.org/10.1093/jos/20.1.35>.
- Giorgi, A., and F. Pianesi. 1997. *Tense and Aspect: From Semantics to Morphosyntax*. Oxford University Press.
- Grønn, A., and A. von Stechow. 2016. "Tense." In *The Cambridge Handbook of Formal Semantics*, edited by M. Aloni and P. Dekker, 313–341. Cambridge University Press.
- Heim, I. 1994. "Some Comments on Abusch's Theory of Tense." In *Ellipsis, Tense, and Questions*, edited by H. Kamp, 143–170. Department of Philosophy, University of Amsterdam.
- Hinrichs, E. 1986. "Temporal Anaphora in Discourses of English." *Linguistics and Philosophy* 9, no. 1: 63–82. <https://doi.org/10.1007/bf00627435>.
- Hohaus, V. 2019. "The Temporal Interpretation of Complement and Relative Clauses: Contrasting English and Samoan." *Austronesian Formal Linguistics Association* 24: 42–60.
- Hornstein, N. 1990. *As Time Goes By: Tense and Universal Grammar*. MIT Press.
- Jóhannsdóttir, K. M., and L. Matthewson. 2007. "Zero-Marked Tense: The Case of Gitksan." *North East Linguistic Society (NELS)* 37: 299–310.
- Kamp, H., and U. Reyle. 1993. *From Discourse to Logic: Introduction to Modeltheoretic Semantics of Natural Language, Formal Logic, and Discourse Representation Theory*. Kluwer Academic Publishers.
- Klein, W. 1994. *Time in Language*. Routledge.
- Kratzer, A. 1998. "More Structural Analogies Between Pronouns and Tense." *Semantics and Linguistic Theory (SALT)* 8: 92–110. <https://doi.org/10.3765/salt.v0i0.2808>.
- Kusumoto, K. 1999. "Tense in Embedded Contexts." Unpublished Doctoral diss., Massachusetts Institute of Technology.
- Lascarides, A., and N. Asher. 1993. "Temporal Interpretation, Discourse Relations, and Commonsense Entailment." *Linguistics and Philosophy* 16, no. 5: 437–493. <https://doi.org/10.1007/bf00986208>.
- Lin, J.-W. 2003. "Temporal Reference in Mandarin Chinese." *Journal of East Asian Linguistics* 12, no. 3: 259–311. <https://doi.org/10.1023/a:1023665301095>.
- Lin, J.-W. 2006. "Time in a Language Without Tense: The Case of Chinese." *Journal of Semantics* 23, no. 1: 1–53. <https://doi.org/10.1093/jos/ffh033>.
- Lin, J.-W. 2012. "Tenselessness." In *The Oxford Handbook of Tense and Aspect*, edited by R. I. Binnick, 669–695. Oxford University Press.
- Long, R. A. 1993. *Zoogocho Zapotec Interlinear Text Project*. Instituto Lingüístico de Verano.
- Matthewson, L. 2006. "Temporal Semantics in a Superficially Tenseless Language." *Linguistics and Philosophy* 29, no. 6: 673–713. <https://doi.org/10.1007/s10988-006-9010-6>.
- Moyer, M., K. Harrigan, V. Hacquard, and J. Lidz. 2015. "2-Year-Olds' Comprehension of Personal Pronouns." In *Boston University Conference on Language Development Online Proceedings Supplement*, Vol. 39. <https://www.bu.edu/buclid/files/2015/06/Moyer.pdf>.
- Mucha, A. 2013. "Temporal Interpretation in Hausa." *Linguistics and Philosophy* 36, no. 5: 371–415. <https://doi.org/10.1007/s10988-013-9140-6>.
- Mucha, A. 2015. "Temporal Interpretation and Cross-Linguistic Variation." Unpublished Doctoral diss., University of Potsdam.
- Ogihara, T. 2007. "Tense and Aspect in Truth-Conditional Semantics." *Lingua* 117, no. 2: 392–418. <https://doi.org/10.1016/j.lingua.2005.01.002>.
- Ogihara, T., and Y. Sharvit. 2012. "Embedded Tenses." In *The Oxford Handbook of Tense and Aspect*, edited by R. I. Binnick, 638–668. Oxford University Press.
- Pancheva, R., and M. L. Zubizarreta. 2020. "Temporal Reference in the Absence of Tense in Paraguayan Guarani." *North East Linguistic Society (NELS)* 50, no. 2: 265–278.
- Pancheva, R., and M. L. Zubizarreta. 2023. "No Tense: Temporality in the Grammar of Paraguayan Guarani." *Linguistics and Philosophy* 46, no. 6: 1329–1391. <https://doi.org/10.1007/s10988-023-09387-0>.
- Partee, B. H. 1973. "Some Structural Analogies Between Tenses and Pronouns in English." *Journal of Philosophy* 70, no. 18: 601–609. <https://doi.org/10.2307/2025024>.

- Partee, B. H. 1984. "Nominal and Temporal Anaphora." *Linguistics and Philosophy* 7, no. 3: 243–286. <https://doi.org/10.1007/bf00627707>.
- Plumb, M. H. 2024. "Temporal-Modal Semantics in Diza (Tlacochohuaya Zapotec)." Unpublished Doctoral diss., University of Texas, Austin.
- Reichenbach, H. 1947. *Elements of Symbolic Logic*. University of California Press.
- Reis Silva, M. A., and L. Matthewson. 2007. "An Instantaneous Present in Blackfoot." In *Semantics of Underrepresented Languages in the Americas (SULA)*, Vol. 4, 191–214.
- Ritter, E., and M. Wiltschko. 2005. "Anchoring Events to Utterances Without Tense." In *West Coast Conference on Formal Linguistics (WCCFL)*, Vol. 24, 343–351.
- Rullmann, H., and L. Matthewson. 2018. "Towards a Theory of Modal-Temporal Interaction." *Language* 94, no. 2: 281–331. <https://doi.org/10.1353/lan.0.0227>.
- Schiffrin, D. 1981. "Tense Variation in Narrative." *Language* 57, no. 1: 45–62. <https://doi.org/10.1353/lan.1981.0011>.
- Schlenker, P. 2004. "Context of Thought and Context of Utterance (A Note on Free Indirect Discourse and the Historical Present)." *Mind & Language* 19, no. 3: 279–304. <https://doi.org/10.1111/j.1468-0017.2004.00259.x>.
- Schlenker, P. 2006. "Ontological Symmetry in Language: A Brief Manifesto." *Mind & Language* 21, no. 4: 504–539. <https://doi.org/10.1111/j.1468-0017.2006.00288.x>.
- Shaer, B. 2003. "Toward the Tenseless Analysis of a Tenseless Language." In *Semantics of Underrepresented Languages in the Americas (SULA)*, Vol. 2, 139–156.
- Smith, C. S. 1997. *The Paramater of Aspect*. 2nd ed. Kluwer Academic Publishers.
- Smith, C. S. 2003. *Mode of Discourse: The Logical Structure of Texts*. Cambridge University Press.
- Smith, C. S., and M. S. Erbaugh. 2005. "Temporal Interpretation in Mandarin Chinese." *Linguistics* 43, no. 4: 713–756. <https://doi.org/10.1515/ling.2005.43.4.713>.
- Smith, C. S., E. T. Perkins, and T. B. Fernald. 2007. "Time in Navajo: Direct and Indirect Interpretation." *International Journal of American Linguistics* 73, no. 1: 40–71. <https://doi.org/10.1086/518334>.
- Sonnenschein, A. 2004. "A Descriptive Grammar of San Bartolomé Zoogocho Zapotec." Unpublished Doctoral diss., University of Southern California.
- Thomas, G. 2014. "Nominal Tense and Temporal Implicatures: Evidence From Mbyá." *Natural Language Semantics* 22, no. 4: 357–412. <https://doi.org/10.1007/s11050-014-9108-2>.
- Tonhauser, J. 2011a. "The Paraguayan Guaraní Future Marker *-ta*: Formal Semantics and Cross-Linguistic Comparison." In *Tense Across Languages*, edited by R. Musan and M. Rathert, 207–232. De Gruyter.
- Tonhauser, J. 2011b. "Temporal Reference in Paraguayan Guaraní, a Tenseless Language." *Linguistics and Philosophy* 34, no. 3: 257–303. <https://doi.org/10.1007/s10988-011-9097-2>.
- Toosarvandani, M. 2016. "The Temporal Interpretation of Clause Chaining in Northern Paiute." *Language* 94, no. 2: 850–889. <https://doi.org/10.1353/lan.2016.0075>.
- Toosarvandani, M. 2021. "Encoding Time in Tenseless Languages: The View From Zapotec." In *West Coast Conference on Formal Linguistics (WCCFL)*, Vol. 37, 21–41.
- Toosarvandani, M. 2024. "Talking About the Future in Zapotec." In *Semantics of Underrepresented Languages in the Americas (SULA)*, Vol. 12, 137–156.
- von Stechow, A., and A. Grønn. 2013a. "Tense in Adjuncts Part 1: Relative Clauses." *Language and Linguistics Compass* 7, no. 5: 295–310. <https://doi.org/10.1111/inc3.12020>.
- von Stechow, A., and A. Grønn. 2013b. "Tense in Adjuncts Part 2: Temporal Adverbial Clauses." *Language and Linguistics Compass* 7, no. 5: 311–327. <https://doi.org/10.1111/inc3.12019>.
- Wurmbrand, S. 2014. "Tense and Aspect in English Infinitives." *Linguistic Inquiry* 45, no. 3: 403–447. https://doi.org/10.1162/ling_a_00161.
- Zucchi, S. 2005. "The Present Mode." In *Reference and Quantification: The Partee Effect*, edited by G. N. Carlson and F. J. Pelletier, 1–28. CSLI.