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No tense: Temporality in the grammar of Paraguayan Guarani

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Abstract Paraguayan Guarani does not overtly mark tense in its inflectional system. Prior accounts of languages without obligatory morphological tense have posited a phonologically covert lexical tense, or have introduced tense semantics via a rule, in the post-syntactic interpretative component. We offer a more radical approach: Paraguayan Guarani does not have tense at the level of lexical or logical semantics. We propose that evaluation time shift, a mechanism independently attested in the *narrative present* in languages with tense, is more widely used in Paraguayan Guarani for encoding temporal meaning. The broader consequence of our proposal is that tense is not a linguistic universal.

Keywords tense · tenselessness · evaluation time shift · narrative present · linguistic universals · Paraguayan Guarani

1 Variation in the grammar of temporalilty

1.1 No overt tense

Paraguayan Guarani (from the Tupi-Guarani division of the Tupian family) does not have overt tense morphemes (Tonhauser 2011a,b). The language is otherwise

The name of the language is usually spelled as Guaraní in texts written in other languages. We adopt the spelling convention used in texts written in the language itself, without a final accent. The data reported here is based on fieldwork conducted in Asunción, Paraguay. In addition to working with several primary consultants, we also conducted four questionnaires: one was presented orally and the remaining three were distributed in written form.

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not morphologically impoverished. Its verbs are obligatorily marked for ϕ-features such as person and number, following a direct/inverse pattern, and some argument-structure alternations are also marked by overt inflection. Both types of morphemes can be seen in (1) (Zubizarreta & Pancheva 2017a: (4a), (6a), (8a))[1]. The sentences in (1) can all receive present or past, but not future, interpretation.

(1) a. a-jahu
1SG-bathe
'I bathe(d).' (*direct*)

b. ro-mbo-jahu
1SG→2SG-TR-bathe
'I bathe(d) you.' (*direct*)

c. che=mbo-jahu
1SG.OBJ=TR-bathe
'You bathe(d) me.' (*inverse*)

In addition to ϕ-feature-marking and argument-changing morphemes, verbs can also be marked with an overt aspectual suffix, (2a), or combine with free aspectual morphemes, as in (2b) and (2c).[2] The aspects further restrict temporal interpretation, in combination with aktionsart, as is to be expected. The sentences in (2a)-(2b) only have a single temporal reading, the former present and the latter past, but the sentence in (2c) allows both a present and past interpretation. Of course, these facts raise the question of whether *kuri* is a past tense and *-ta* a future tense; we come back to this question in §4 and show that they are not, in line with Tonhauser (2006, 2011a,b).

(2) a. a-karú-ta
1SG-eat-PROSP
'I am going to eat.'

b. a-karu kuri
1SG-eat RETROSP
'I ate.'

c. a-karu hína
1SG-eat CONT
'I am/was eating.'

Lack of overt tense is not an isolated phenomenon. Languages without overt tense are found in a varied group of families.[3] Other languages reportedly have optional tense morphemes.[4] Many of these languages otherwise have obligatory ϕ-feature in-

[1] 1SG→2SG glosses a portmanteau prefix marking person and number features of the agent and theme, respectively. The order is direct because the agent has a higher person value than the theme. In inverse orders, an object clitic for the theme, which is higher in person value than the agent, replaces the prefix. TR stands for 'transitive'.

[2] Abbreviations in the glosses in (2) are to be interpreted as follows: PROSP 'prospective', RETROSP 'retrospective' and CONT 'continuous'. Paraguayan Guarani has several other morphemes which have been argued by Tonhauser (2006, 2011b) to be aspectual but we leave them aside here.

[3] Languages with no overt tense include Kalaallisut (Eskimo-Aleut), Shaer (2003), Bittner (2005, 2011); Chinese (Sino-Tibetan), Smith & Erbaugh (2005), Lin (2006); Blackfoot (Algonquian), Ritter & Wiltschko (2004), Reis Silva & Matthewson (2007); St'át'imcets (Salish), Matthewson (2006); Gitxsan (Tsimshianic), Jóhannsdóttir & Matthewson 2007; Yucatec Maya (Mayan), Bohnemeyer (2009); Hausa (Afro-Asiatic), Mucha (2013), Bochnak et al. (2019); Northern Paiute (Uto-Aztecan), Toosarvandani (2016); Samoan (Austronesian) Bochnak et al. (2019); Sierra Zapotec (Oto-Manguean), Toosarvandani (2020).

[4] Languages that have been argued to have optional tense include Mbyá Guarani (Tupi-Guarani), Thomas (2014); Washo (isolate), Bochnak (2016); Medumba (Niger-Congo), Mucha (2017); Tlingit (Na-Dene), Cable (2017); Atayal and Javanese (Austronesian), Chen et al. (2021).

flection and overt aspect; thus the absence of overt tense or its optional realization cannot be attributed to a more general tendency of not marking inflectional categories overtly. The possibility for temporal reference in the absence of explicit marking of tense calls for an explanation.

A simple answer would attribute the differences among languages to variation in the phonological realization of tense inflection. Yet this cannot be the only explanation. Languages without overt tense differ in what temporal interpretations they allow; specifically, whether future reference is possible without an overt prospective aspectual marker. In Paraguayan Guarani prospective *-ta* is generally required for describing future events (with some qualifications to be discussed later), and the same has been said to be the case in St'át'imcets, Gitxsan, Washo, Sierra Zapotec, a.o.. Yet this is not so in other languages without overt tense. See (3a) from Yucatec Maya (Bohnemeyer 2009: (15d)) and (3b) from Hausa (Mucha 2013: (1)), where not only present and past, but also future interpretation is possible.[5] The fact that there are constraints on the possible temporal reference, and the constraints are subject to cross-linguistic variation, strengthens the case for the involvement of lexical and grammatical mechanisms beyond phonological realization.

(3) a. Táan in=mèet-ik le=nah=o' *(Y. Maya)*
PROG A1SG=do:APPL-INCOMPL(B3SG) DET=house=D2
'I am/was/will be building the house.'

b. Su-nà̀ wà̀sā. *(Hausa)*
3PL-CONT play
'They are/were/will be playing.'

Cross-linguistic facts make it clear that overt tense is not obligatory for temporal reference. Past and present interpretation can be achieved without explicit marking of past and present tense. There is also variation in whether future reference is possible in the absence of a prospective marker.

1.2 Semantic analyses of languages without overt tense

The analytical challenge posed by languages without overt tense is to derive temporal reference and any constraints on it, while keeping the usual semantics of aspect. If these languages have aspectual morphemes that behave like their counterparts in languages with overt tense, the posited difference in the grammar of temporality needs to be fairly limited. Among the semantic analyses that have been proposed for languages without overt tense, those that retain commonly accepted views of aspect, and are also formally explicit, all posit tense, i.e., a linguistic device – a morpheme or a rule – that identifies a time interval and relates it to the speech time (in matrix clauses). The analyses differ along two dimensions: (i) how they accomplish reference to time intervals

[5] Abbreviations in the glosses in (3) are to be interpreted as follows: PROG 'progressive', APPL 'applicative', INCOMPL 'incompletive' (a category that combines imperfective aspect and indicative mood), CONT 'continuous'. ϕ-markers differ between sets A and B, following an 'active-inactive' pattern. D2 glosses a distal deictic clitic.

– via a syntactically-represented lexical item (e.g., a covert pronoun) or a purely semantic rule without a lexical and syntactic basis, and (ii) how they restrict the location of those time intervals – via covert lexical features or discourse constraints. Along the spectrum of analytic possibilities are accounts that attribute both, one, or neither of these two dimensions of temporal reference to lexically-specified expressions, but in the semantic component they all involve tense as they all include in the truth conditions of sentences a certain time interval in relation to the speech time. We aim to develop a different type of account that does not rely on tense for temporal reference: neither as part of the lexical semantics of syntactically-represented expressions, nor as part of a post-syntactic semantic rule. We present below the main claims of the various accounts at an informal level, postponing an explicit characterization for §3.

1.2.1 Semantic analyses involving tense

Covert lexical tense with lexical restriction on temporal reference This type of analysis attributes the absence of overt tense inflection to the fact that lexical tense is covert. Most accounts of this type posit a phonologically null version of the tense morphemes found in tense languages, preserving both the syntactic and lexical-semantic universality of tense (e.g., Matthewson 2006 for St'át'imcets, Jóhannsdóttir & Matthewson 2007 for Gitxsan, Reis Silva & Matthewson 2007 for Blackfoot, Cable 2017 on Tlingit, Chen et al. 2021 on Atayal). Other accounts propose that the covert lexical tense is an adverbial (Thomas 2014 for Mbyá Guarani), or incorporate tense semantics into morphemes for viewpoint aspect (Lin 2006 for Chinese), maintaining the lexical-semantic universality of tense, while allowing for variation in its morpho-syntactic expression. On all versions of this approach, lexically restricted tenses are part of the lexicons of all languages and cross-linguistic variation concerns only their phonological or morpho-syntactic realization, apart from their specific lexical semantics (non-future, past, present). Tense may not be overtly pronounced or merged in a tense projection, but it is part of the universal inventory of lexical interpretable features.

Tense via a post-syntactic rule At the other extreme is an analysis that does not posit lexical tense either in terms of reference to times or restriction on this reference (Tonhauser 2011b on Paraguayan Guarani). Yet tense semantics is nevertheless supplied via a semantic rule after the syntactic derivation is completed, and a discourse restriction further constrains the effects of the semantic rule. On this approach tense is still a semantic universal, even if not also a lexical or a syntactic one.

Covert lexical tense with no lexical restriction on temporal reference This approach retains a minimal structural and lexical-semantic role for tense in the form of a covert pronoun that denotes a contextually salient interval. No lexical restrictions are imposed on the referents of the tense pronoun. If the interpretation is restricted, e.g., to non-future, the restriction is established through discourse constraints. This account is adopted by Mucha (2013) for Hausa, Bochnak (2016) for Washo, Toosarvandani (2016) for Northern Paiute, Mucha (2017) for Medumba, Bochnak et al. (2019) for Samoan, Chen et al. (2021) for Javanese; in all cases the tense pronoun is

realized syntactically in a tense projection. Alternatively, Shaer (2003) suggests that in Kalaallisut tense semantics is built into the meaning of verbs and not expressed in a syntactic tense node. On this approach too tense is a semantic universal, with cross-linguistic variation limited to the possibility of discourse restrictions on temporal reference and the morpho-syntactic realization of the tense pronoun.

1.2.2 An alternative semantic analysis without tense

We develop an alternative with no tense – either in the lexical or in the logical semantics – or, for that matter, in the syntax. We propose that in the absence of tense, temporal reference is obtained through manipulation of the temporal parameter of the context of evaluation. By default, the time of evaluation (for matrix clauses) is the speech time. This is so in languages with tense and should be so in languages without tense as well. But the evaluation time can also be shifted, as happens in the phenomenon of the *narrative present* found in languages with tense. A special mode of narration permits the use of the simple present tense for description of events that are not contemporaneous with the time of speech. An illustration can be seen in (4) (Schiffrin 1981: (2e)-(2l)), where the simple present tense alternates with the past tense in a conversational narration of events that happened prior to the time of the speech context. What allows this alternation of tenses is a shift of the evaluation time from the actual speech time to the past time when the events happened.

(4) We just pulled into this lot [...] and all of a sudden the buzzer *sounds* [...] So we asked some guy t' come over an' help us. So he *opens* the car and everyone *gets* out except me and my girlfriend. We were in the front we just didn't feel like getting out. And all of a sudden all these sparks *start* t' fly.

Evaluation time can also be shifted forward. In narratives about the future, the present tense can be used for descriptions of events that are located after the time of the speech context. An excerpt from an opinion piece in the *Washington Post*, published on January 19, 2021, offers an illustration, (5). Here too we see an alternation between the canonical use of the present tense and the narrative present. The title of the piece is in the canonical present, which, with the help of auxiliary *woll*, makes salient a time six months into the future of the speech time.[6] The third and fourth sentence also use the canonical present. In contrast, the first two sentences and the last sentence of the excerpt are in the narrative present, where the evaluation time is shifted forward, to July 2021, and the present tense, without *woll*, is used for reference to this future time.

(5) What the Biden era will feel like, six months in
The Biden era *is* well underway by now. The world – wary still at the bizarrely unrecognizable and unreliable United States of the previous four years – *has* begun to breathe just a touch more easily. [...] The past four years have been an unending succession of places where we had previously never been before [...]

[6] The auxiliary verb *woll* contributes modal and prospective aspectual interpretation, and in combination with present or past tense it surfaces as *will* or *would*, respectively (Abusch 1997, a.o.; for a recent overview see Bochnak 2019).

> And so, conservatives six months from now will have embarked on a period of soul-searching. [...] In July 2021, I *have* gone back to worrying about things both meaningful and mundane.

While in English tense is obligatory in matrix and in finite embedded clauses, and so the present tense is used in case of a shifted evaluation time, the mechanism of evaluation time shift itself is not dependent on tense. We propose that evaluation time shift can be used more broadly, outside of the special narrative mode seen in (4) and (5), in at least some languages without overt tense morphology. Whether the evaluation time is the default speech time or is shifted, determines temporal reference – entirely without tense. We develop this analysis for Paraguayan Guarani, but in principle, the account could be applicable to other languages without overt tense, offering a distinct analytic alternative to the tense accounts that have been previously proposed. On our account, languages whose lexical inventory does not include tense, do not get to have tense in the semantic component either. They have to make use of an independently available mechanism for temporal reference: evaluation time shift. In other words, tense is not a semantic universal.

2 Theoretical preliminaries: tense and aspect

We adopt a neo-Reichenbachian framework for tense and aspect (Klein 1994, a.o., after Reichenbach 1947). In this framework tense does not directly locate eventualities in time; rather it is concerned solely with the temporal location of a *reference time* in relation to the *evaluation time* for the clause. Other temporal relations, e.g., between the event(uality) time and the reference time, are left to the domain of aspect. The separation of tense and aspect in this framework has been very successful in clarifying the meaning of functional morphemes that contribute to temporal interpretation in various languages. The separation also allows for the possibility that a language can have aspectual morphemes but no tense morphemes.

2.1 Tense

The truth of propositions is evaluated relative to an *evaluation time*. In matrix clauses, the default evaluation time is the speech time, the speaker's *now*, but it may shift in special cases, as in (4) and (5). Formal accounts of temporal reference suggest that the context of evaluation c, to which the interpretation function is relativized, $[\![.]\!]^c$, provides the evaluation time t_c. Thus, $[\![\phi]\!]^c$ is true iff ϕ is true at time t_c.

The lexical semantics of tenses may encode the context dependency directly by reference to t_c, as in (6).

(6) $[\![\ \text{PAST}_i\ ]\!]^{g,c}$ is defined only if $g(i) < t_c$; if defined $[\![\ \text{PAST}_i\ ]\!]^{g,c} = g(i)$

This example illustrates the pronominal analysis of tense, an approach that is typically adopted in the literature on languages without overt tense.[7] According to this analy-

[7] A common alternative is the quantificational approach to tense: the past (and present) assert the existence of a time that precedes (or equals) t_c, and which is further restricted by inclusion in a contextually

sis, tense is a temporal pronoun denoting a contextually salient time – the reference time $g(i)$ – whose temporal location relative to the evaluation time is presupposed. A more articulated version of (6) separates the pronominal part of tense from the lexical restriction on its reference (more on this in §3.2.3 and §3.3). The reference time sets the local attitude holder's perspective for the description of the event, with aspect elaborating further.[8]

2.2 Aspect

We make a general distinction between two kinds of aspects: *viewpoint aspects* like the perfective and imperfective vs. the perfect (or retrospective) and prospective, which we will call *high aspects*.[9] High aspects express relations between the reference time, contributed by tense, and another temporal interval, see (7a) for the meaning of prospective *woll* (Abusch 1997), and (7b) for the meaning of the perfect in English and German (Pancheva & von Stechow 2004).[10] We follow Tonhauser (2006, 2011a,b) in treating *-ta* in Paraguayan Guarani, seen in (2a), as a prospective aspectual marker. Tonhauser analyzes *-ta* along the lines of English *woll* in (7a), i.e., as a high aspect in our terminology (the two are also associated with a modal meaning, which we put aside). We note in §4.2 that a prospective meaning need not be encoded by a high aspect but may be associated with a viewpoint aspect. As our main proposal does not hinge on settling this distinction, we do not address here the precise semantics of *-ta*. We also argue in §4.3 that *kuri*, seen in (2b), has the same meaning as the perfect in (7b).

(7) a. $[\![\text{PROSPECTIVE}]\!] = [\![\textit{woll}]\!] = \lambda p_{\langle i,t \rangle} \lambda t \exists t' [t' > t \wedge p(t')]$
b. $[\![\text{PERFECT}]\!] = \lambda p_{\langle i,t \rangle} \lambda t \exists t' [t' \leq t \wedge p(t')]$
$(t' \leq t$ iff $\neg \exists t'' [t'' \subset t' \wedge t'' > t])$

Viewpoint aspects differ from high aspects in that they encode relations involving the event(uality) time, $\tau(e)$. In the absence of a high aspect in the clause, viewpoint aspect relates the event time to the reference time introduced by tense; in the presence

salient interval. In yet another approach, tenses are binary predicates that have non-overt time-denoting arguments; the pronominal external argument of tense is indexical in matrix clauses and denotes the speech time, t_c while its reference is controlled by the time of the matrix attitude event in embedded clauses (Stowell 1996, 2007). While the specifics of the lexical semantics of tense may differ, on all approaches tense introduces in the logical form a time interval in relation to the evaluation time. For an overview of tense semantics, see Ogihara 2007, 2011, Ogihara & Sharvit 2012, Ogihara & Kusumoto 2020, Sharvit 2020, a.o.).

[8] Corresponding to our use of 'reference time' are the terms 'topic time' (Klein 1994) or 'assertion time' (Demirdache & Uribe-Etxebarria 2000).

[9] These core aspectual relations have sub-types, e.g., the non-habitual uses of imperfective aspect are usually called *continuous* (Comrie 1976), and the progressive, in English and other languages, is one type of continuous aspect, restricted to non-stative predicates. There is a lot of variation in how the core aspectual relations and their sub-types are instantiated in specific morphemes in different languages and we clearly cannot do justice to this variation here.

[10] The meaning in (7b) is not universally adopted, e.g., Kratzer (1998) analyzes the perfect as a viewpoint aspect. The interval introduced by the perfect, t' in (7b), has sometimes been called the *perfect time span* (Iatridou et al. 2001), a term we will also use.

of a high aspect, viewpoint aspect relates the event time to the time introduced by the high aspect, i.e., the prospective time or the perfect time span. In other words, the time argument t in (8a)-(8b) gets bound by either high aspect, or by tense directly. Following Tonhauser (2006, 2011b), we attribute to the Paraguayan Guarani morpheme *hína*, seen in (2c), the interpretation of a continuous aspect (Comrie 1976), a type of the general imperfective whose core meaning is seen in (8b).[11] And also in line with Tonhauser (2011b), we suggest that Paraguayan Guarani has covert viewpoint aspect, with an underspecified meaning – we represent it as $\tau(e)$ AT t – that varies with aktionsart, see (9).[12]

(8) a. $[\![\text{PERFECTIVE}]\!] = \lambda P_{\langle v,t\rangle}\, \lambda t\, \exists e\, [P(e) \wedge \tau(e) \subseteq t]$
b. $[\![\text{IMPERFECTIVE}]\!] = \lambda P_{\langle v,t\rangle}\, \lambda t\, \exists e\, [P(e) \wedge t \subset \tau(e)]$

(9) $[\![\text{ASP}_{\varnothing}]\!] = \lambda P_{\langle v,t\rangle}\, \lambda t\, \exists e\, [P(e) \wedge \tau(e)\, \text{AT}\, t]$ $\quad (t\, \text{AT}\, t' \text{ iff } t \subseteq t' \vee t' \subset t)$

We discuss the high and viewpoint aspects of Paraguayan Guarani further in §4. In line with the neo-Reichenbachian perspective that separates the role of tense and aspect, it is possible for a language to have aspect but no tense, and we propose that this characterizes Paraguayan Guarani.

2.3 Lexical tense vs. its absence

We sketch L(ogical) F(orm)s with and without lexical tense in (10). Let us focus first on the IPs. Lexical tense, when it is syntactically present in the IP, binds the time argument of the highest aspect, t in (10b).

(10) a. $[_{CP} \ldots\ [_{IP}\ \ldots\ldots\ [_{AspP}\ \boldsymbol{\lambda t}\, \exists e\, [P(e) \wedge \tau(e)\, \text{AT}\, t\,]]]]$ *no lexical tense*
b. $[_{CP} \ldots\ [_{IP}\ \textbf{TENSE}\ [_{AspP}\ \boldsymbol{\lambda t}\, \exists e\, [P(e) \wedge \tau(e)\, \text{AT}\, t\,]]]]$ *lexical tense*

In the absence of lexical tense, the semantic time variable of aspect, t in (10a), remains unsaturated at the IP level. There are two options for this variable in the absence of lexical tense: it could be interpreted as the time of the context of evaluation, by a semantic rule along the lines of Lin (2006), Zucchi (2009), a.o., or a different semantic rule could be posited that interprets it as denoting the salient reference time, as in Tonhauser (2011b). The former is an instance of a true absence of tense (lexical, syntactic and semantic), the latter is a case of non-lexical, post-syntactic, rule-based semantic tense.

We develop a version of the first, truly tenseless approach. We adopt a representation where the evaluation time is syntactically represented as a covert indexical pronoun *pro* in the CP domain, as in (11a) (as in Pancheva & Zubizarreta, 2020, following Enç 1987, Kusumoto 2005, and the spirit of Stowell 1996, 2007). Evaluated in a context c, *pro* denotes the time of the context, t_c, (11b).

[11] Tonhauser (2006, 2011b) refers to *hína* as 'progressive', but since it is compatible with states, we have chosen to call it 'continuous'. Stative predicates are known to resist the progressive cross-linguistically.

[12] The covert viewpoint aspect can also be interpreted habitually. Additionally, Paraguayan Guarani has overt morphemes that unambiguously mark habitual aspect, see footnote 28.

(11) a. $[_{CP}\ pro\ \ [_{IP}\ \ \ldots\ldots\ \ [_{AspP}\ \boldsymbol{\lambda t}\ \exists e\,[P(e) \wedge \tau(e)\,\text{AT}\,t\,]]]]$
b. $[\![\,pro\,]\!]^c = t_c$

The evaluation-time denoting *pro* binds the time variable of aspect, t in (11a). In attitude complements *pro* is abstracted over, (12), giving the matrix attitude verb a suitable argument, and in effect making the time of the matrix attitude event the evaluation time for the complement clause (cf. the bound zero pronoun in Heim 1994, Sharvit 2003, and the temporally controlled pronoun in Stowell 1996, 2007).

(12) $[_{CP}\ \ldots\ldots\ [_{CP}\ \boldsymbol{\lambda_1}\ \ \boldsymbol{pro}_1\ \ \ldots..\ \lambda t\ \exists e\,[P(e) \wedge \tau(e)\,\text{AT}\,t\,]]]$

Our core idea – that temporal interpretation in Paraguayan Guarani is derived solely via a default and shifted evaluation time – is not dependent on the presence of an indexical, evaluation-time-denoting pronoun at LF. The evaluation time could just as well be represented solely as a parameter of evaluation. All that would be required is a semantic rule that specifies that the unbound temporal variable is interpreted as denoting the speech time, as in Lin (2006), Zucchi (2009), see (13).

(13) $[\![\,[_{CP}\ \boldsymbol{\lambda t}\ \exists e\,[P(e) \wedge \tau(e)\,\text{AT}\,t\,]]\,]\!]^c = 1 \ \ \text{iff} \ \ \exists e\,[P(e) \wedge \tau(e)\,\text{AT}\ t_c\,]$

Our analysis could easily be implemented as in (13). Yet the syntactic representation of the evaluation time, as in (11a) permits compositional interpretation without recourse to a special semantic rule. A syntactic representation with an indexical *pro* allows only elements present in the syntax and the lexicon to affect meaning.

Crucially, indexical *pro* may be posited both in structures with lexical tense, (10b), and in those without, (10a)/(11a). Analyses of tense as an existential quantifier, and as a predicate (see ftn. 7) already separate the context-dependent component from the lexical semantics of tense proper, because not doing so complicates the analysis of tense in complements to attitude verbs, where the evaluation time for tense is typically the time of the attitude (as is the case for the English past tense). On these approaches, tense itself has a time argument, e.g., t' in (14), which is interpreted as the time of the context of evaluation. This could be done so by a semantic rule (Lin 2006, Zucchi 2009) or via binding by an evaluation-time denoting *pro* (Enç 1987, Kusumoto 2005), i.e., the same analytical choice as the one between (13) and (11a).

(14) $[\![\,\text{PAST}_i\,]\!]^{g,c} = \lambda t'\,\lambda\, p_{\langle i,t\rangle}\,\exists t\,[t < t' \wedge t \subseteq g(i) \wedge p(t)\,]$

The tense analyses that have been proposed for languages without overt tense and that we will discuss next, all adopt a pronominal(-like) approach – either a lexical pronominal tense or a semantic rule that mirrors the referential properties of tense pronouns. Thus, the comparison will be between our analysis that only employs an evaluation-time denoting pronoun and does not introduce a reference time in the logical form, and analyses that evoke a reference time in relation to the evaluation time.

3 No tense vs. tense in the absence of overt tense inflection

Now that we have discussed the neo-Reichenbachian representations underlying temporal reference with and without lexical tense, we can turn to the question of how

temporal interpretation can be derived in the absence of overt tense morphemes, with particular focus on Paraguayan Guarani. We present our tenseless proposal in §3.1. It works with LFs as in (11a) in the absence of a special semantic rule determining how the variable of aspect is to be interpreted: that variable is bound by the evaluation-time denoting *pro*. In §3.2 we discuss alternative approaches, all involving some form of tense. One approach, discussed in §3.2.1, assumes an LF as in (10a), but then posits a rule introducing non-lexical tense, i.e., specifying that the variable of aspect denotes the reference time, much like a lexical pronoun would. Two other approaches, discussed in §3.2.2 and §3.2.3, posit some form of lexical tense, phonologically null, in LFs of the kind sketched in (10b).

We note that our account localizes cross-linguistic variation strictly to tense or its absence, preserving uniformity in the analysis of aspect and employing temporal variables.[13]

3.1 No tense in the lexical and/or logical semantics in Paraguayan Guarani

We propose that Paraguayan Guarani has no semantic tense, neither lexical nor post-syntactic. The LFs that determine temporal interpretation are as in (11a): no lexical tense is merged in the inflectional domain. Given that there is no tense, the evaluation-time denoting *pro* binds the time variable of aspect. Variation in temporal reference in matrix clauses results from manipulation of the context parameter: whether evaluation is with respect to the speech time or the time of a shifted context. The default evaluation time is the speech time, the result is present reference. Future reference is derived with prospective *-ta* (or with other modals, which we do not discuss here). The challenge is to derive past interpretation. We suggest that past reference obtains via evaluation time shift. The evaluation time may shift to a time represented as if it were the speech time, as happens in the *narrative present* in languages with tense. If the shifted evaluation time is before the actual speech time, the result is past interpretation. If the evaluation time is shifted forward, a second mechanism for deriving future reference, without a prospective marker, becomes available. The manipulation of the evaluation time – default or shifted – derives temporal reference without tense.

3.1.1 Evaluation time shift

A present tense can reference a past time, in the context of narration. This is particularly well illustrated in (15), from (Schlenker 2004: (2)). The adverbial *fifty eight years ago to this day* links to the time of the speech event (via *this day* and *ago*) and makes salient a time in the *past* of the speech time; then *on January 22, 1944* further restricts that past time, and indirectly also establishes the exact time of the speech event. The canonical tense to describe events in the past of the speech time is the past

[13] A reviewer observes that a more radical cross-linguistic difference could involve absence of temporal variables altogether, and draws a parallel to proposals in the literature on gradability that while some languages employ degree variables, others are truly degree-less.

tense, yet the tenses in (15) are present. This use of the present tense for the description of events in the past or future of the speech time, in narratives, is known as the *narrative present* (or *historical present*).[14]

(15) Fifty eight years ago to this day, on January 22, 1944, just as the Americans *are* about to invade Europe, the Germans *attack* Vercors.

While evaluation time shifts to the past are more common, forward shifts are also possible, as seen earlier in (5). The publication date of the op-ed, January 19, 2021, sets the time of the speech event, and the title *What the Biden era will feel like, six months in* makes salient a time in the future of the speech time, through a canonical use of present tense and prospective *woll*. In that context, the adverbial *in July 2021* in the excerpted sentence in (16) is interperetd as restricting a future time, yet the tense is present.

(16) In July 2021, I *have* gone back to worrying about things both meaningful and mundane.

It is important to emphasize that narratives can also consistently use canonical tense that is evaluated with respect to the speech time. The same narrative can also switch back and forth from canonical tenses to tenses interpreted relative to a shifted evaluation time, such as the narrative present, as seen in (4) and (5).[15] We will refer to stretches of narrative that involve a shifted evaluation time as being in a *narrative mode*, those that rely on a default speech time as being in a *canonical mode*, and those that shift back and forth between the default and shifted evaluation time as being in a *mixed mode*.[16]

The narrative present involves shifting the evaluation time from the actual speech time to another salient time. This analysis is suggested informally in Hornstein (1990): 11-12, a.o., and implemented formally in Schlenker (2004), Zucchi (2005), Eckardt (2015), Anand & Toosarvandani (2018a,b). The present tense has its usual semantics: it places the reference time at the evaluation time. If the evaluation time is shifted back, the present tense locates the reference time at a past time. If the evaluation time is shifted forward, the present tense indicates that the reference time is in the future of the speech time. Importantly, evaluation time shift is independent of tense, and so can be expected to apply to languages without tense. This is what we suggest happens in Paraguayan Guarani.

[14] We prefer the term *narrative present* as it avoids bias towards past temporal reference and also highlights the link to narratives.

[15] Other tenses besides the present may also be evaluated relative to a shifted evaluation time. An example is seen in (i), from Zucchi (2005): (10)-(11), where two past forms, the *imperfetto* 'imperfect' and the *piuccheperfetto* 'pluperfect' are most plausibly evaluated relative to the shifted evaluation time of the whole narrative.

(i) Nel gennaio del 44 a.C. Cesare è dittatore a vita. Nel 49 a.C. { *passava* / *aveva* passato } il Rubicone. Nel marzo del 44 a.C. verrà ucciso in Senato.
In January 44 B.C. Caesar is dictator for life. In 49 B.C. he { crossed / had crossed } the Rubicon. In March 44 B.C. he will be killed in the Senate.

[16] *Present mode*, *historical mode*, and *present historical mode* are the terms used in Zucchi (2005) for the *narrative mode*.

3.1.2 Bi-contextual evaluation

In implementing evaluation time shift in the narrative present, Schlenker (2004) uses the formal mechanism of bi-contextual evaluation. Sentences are evaluated with respect to two contexts: the actual speech context, marked here as s, and the narrative context, marked here as n. Each of the two contexts provides an evaluation time: t_s is the time of the speech context and t_n the time of the narrative context. In the narrative present mode, present tense and adverbials are evaluated relative to different evaluation times. Adverbials are interpreted relative to t_s, (17), just like they also are when outside of the narrative present mode. The present tense is evaluated relative to t_n, whereas outside of the narrative present mode it is canonically evaluated relative to t_s. In the system we have adopted, where the indexical component is separated from tense, the variation in interpretation is localized on the evaluation-time denoting *pro*, as in (18).

(17) a. $[\![\, \textit{this day} \,]\!]^{g,s,n} =$ the day of t_s
b. $[\![\, \textit{fifty-eight years ago} \,]\!]^{g,s,n} = 58$ years before t_s
c. $[\![\, \textit{six months in} \,]\!]^{g,s,n} = 6$ months after t_s

(18) a. $[\![\, \textit{pro} \,]\!]^{g,s,n} = t_s$ b. $[\![\, \textit{pro} \,]\!]^{g,s,n} = t_n$ (*narrative present mode*)

We adopt bi-contextual evaluation for the analysis of temporal reference in Paraguayan Guarani. An illustration can be found in (19a). Atelic predicates without overt aspectual markers in this language may be interpreted as present or past, see (19a) and its LF in (19b). With bi-contextual evaluation, *pro* may denote the speech time t_s, resulting in a present interpretation, or the shifted time t_n, resulting in a past interpretation, if $t_n < t_s$; see (19c). Adverbs are interpreted relative to t_s.

(19) a. Kalo o-purahéi {(kuehe) / (ko'ãga) / (# ko'ẽrõ)}.
Kalo 3-sing yesterday now tomorrow
'Kalo sang (yesterday).' / 'Kalo is singing (now).'
not: 'Kalo will sing (tomorrow).'

b. $[_{CP}\ \textit{pro} \ldots\ \lambda t\, \exists e\, [\,\text{sing}(e)(\textit{kalo}) \wedge \tau(e)\ \text{AT}\ t\ (\wedge\, t \subseteq \textit{now/yesterday})\,]]$
c. $[\![\, \textit{pro} \,]\!]^{s,n} = t_s$ or t_n, $t_n < t_s$
$[\![\, (19b) \,]\!]^{s,n} = 1$ iff $\exists e\, [\,\text{sing}(e)(\textit{kalo}) \wedge\ \tau(e)\ \text{AT}\ t_s\ (\wedge\, t_s \subseteq t_s)\,]]$ or
$\exists e\, [\,\text{sing}(e)(\textit{kalo}) \wedge\ \tau(e)\ \text{AT}\ t_n\ (\wedge\, t_n \subseteq$ the day before the day of $t_s)\,]]$

3.1.3 Cross-linguistic differences in the availability of evaluation time shift

Evaluation time shift differs between Paraguayan Guarani and English in one important aspect: backward evaluation time shift is not restricted to narratives, but can apply freely. This is why (19a) may receive past interpretation outside of narratives. The same is not the case for forward evaluation time shift, which applies only in narratives, just like in English. Thus we see the asymmetry in (19a): future reference is precluded because a future t_n may not be posited for a free-standing clause. We state the proposed restriction on evaluation time shift in (20) and we offer empirical support for this asymmetry in §6.3.1.

(20) a. In Paraguayan Guarani, forward evaluation time is restricted to narratives, backward evaluation time applies freely
b. In English, evaluation time shift is restricted to narratives

What explains this asymmetry? Evaluation time shift is a grammatical mechanism. The default position should be that it is available freely, but it is also to be expected that that it should be grammatically constrained. We should thus seek to explain any restrictions on it that we discover, rather than its free application. While we do not yet fully know what the constraints on evaluation time shift are, it is clear that a restriction to narratives allows for continuity with the non-temporal parameters of the context, most notably the speaker. This narrative restriction should be cross-linguistically universal. It is relaxed in Paraguayan Guarani only in the case of reference to the past, because in the absence of tense, there is no alternative grammatical mechanism to achieve past reference. Paraguayan Guarani keeps the narrative restriction in the case of reference to the future, given that an alternative mechanism is available: the default evaluation time in conjunction with the prospective marker *-ta* can yield future reference. Thus, while the availability of tense and the mechanism of evaluation time shift are independent of one another, they do interact.

We also need to alleviate a potential worry about adopting the mechanism of evaluation time shift for regular temporal reference in Paraguayan Guarani. In English, the narrative present is often associated with stylistic effects. For instance, it is commonly suggested that in the case of personal narratives, e.g., (4), the narrative present contributes to a sense of vividness and immediacy. Such effects, however, are not a general property of the narrative present: they are only seen with certain genres of narratives. The narrative present in English is also found in historical narratives (e.g., (21), Klein 1994: 135), math problems (e.g., (22), Dickey 2000: 136) and in recipes (e.g., (23), Dickey 2000: 161) and other instructions, where the stylistic effects seen in (4) do not obtain.[17]

(21) In 1837, Dickens *completes* the Pickwick Papers. They *are* enthusiastically received by many critics. He *moves* to York and *marries* his grand-niece Joan. In 1838, they *are* divorced again.

(22) A girl is reading a book, which has 60 pages. On the first day she *reads* a quarter of the book, and on the second day 18 pages. How many pages *does* she still have to read?

(23) First you *take* 4 cups of bread, then you *pour* in 1 cup of milk, and *add* 3 eggs and 1 cup of sugar. You *mix* all of that well. Then you *melt* 1 stick of butter and *put* it in the mixture. At the end you *add* a can of pineapple. You *pour* this into an oven-safe dish and *bake* it at 350° for 35 minutes.

Thus, we need to separate the genre-specific convention of use from the mechanism itself. Evaluation time shift itself need not be linked to particular discourse effects.

[17] Klein (1994): 135 calls non-cannonical uses of the simple present like the one in (21) *fact listing* and restricts the term *narrative present* to just vivid narratives like the one in (4); Curme (1931): 355-356 calls such uses *annalistic present*. It is beyond our goal here to offer an analysis of the differences among the various genres of narratives.

3.2 Tense semantics for Paraguayan Guarani

Next we illustrate the proposals that have been advanced for Paraguayan Guarani or for languages with a similar temporal profile, all involving tense. The goal is to be explicit about the differences between our account and those that posit tense, and thus be able to identify conceptual and empirical advantages.

3.2.1 Tense via a post-syntactic rule

Tonhauser (2011b) proposes that Paraguayan Guarani has no lexical tense. Given the structural distinction we set up in (10), this translates to a claim that the relevant LFs in the language are as in (10a). In the absence of a binder for the time variable of aspect, a semantic rule assigns that variable the value of the contextually salient reference time, in effect supplying tense post-syntactically. The rule applies in matrix clauses only, not in complements of attitude verbs (or relative clauses and clausal adjuncts). It is formulated as in (24) (slightly modified from Tonhauser 2011b: (50)).

(24) *Matrix Clause Rule*:
The final translation of a matrix clause translated as $\phi_{\langle s,\langle i,\langle i,t\rangle\rangle\rangle}$ is $\exists t\,(\phi\,(w_0,t_{rt},t))$

Applied to (19a), interpreted as ϕ as in (25a), rule (24) existentially quantifies the event time variable t, interprets the world variable as denoting the actual world, and – this is the crucial part – interprets the variable of aspect t' as referring to the salient reference time, much like a lexical tense pronoun binding this variable would be interpreted. Although not part of the lexicon of Paraguayan Guarani, tense is part of the grammar of the language, introduced by a special semantic rule.

(25) a. $\lambda w\,\lambda t'\,\lambda t\,[\,\text{sing}'(kalo,w,t) \wedge t \text{ AT } t'\ (\wedge t' \subseteq now/yesterday)\,]$
b. $\exists t\,[\,(\,\text{sing}'(kalo,w_0,t) \wedge t \text{ AT } t_{rt}\ (\wedge t_{rt} \subseteq now/yesterday)\,]$

Putting aside temporal adverbials, the logical form in (25b) is compatible with past, present, and future interpretation. But future reference in Paraguayan Guarani is not generally possible without prospective *-ta*. Tonhauser (2011b): 283, 288 posits an additional discourse restriction, (26), which prohibits future reference times and thus has the same effect as the presupposition of a lexical tense pronoun. The discourse restriction is active in matrix clauses, though it is suspended in some (e.g., non-initial conjuncts of coordinations).

(26) *Discourse restriction on temporal reference in matrix clauses:*
Absolute future reference times are not contextually available.

In summary, on this account no lexical tense participates in the syntactic derivation, yet the account still has semantic tense, as it involves reference to the reference time via the Matrix Clause Rule, and a restriction on the reference via the special discourse restriction for matrix clauses.

3.2.2 Covert lexical tense with a lexical restriction on temporal reference

An early and influential representative of this approach is developed in Matthewson (2006) for St'át'imcets. In that language, like in Paraguayan Guarani, verbs that are not overtly marked for aspect can be interpreted as describing past or present events but not future events. For an event to be interpreted as future, an overt prospective aspectual morpheme is required. Matthewson (2006) analyzes St'át'imcets as being only superficially tenseless: it has a covert non-future tense morpheme and its LFs are as in (10b). Covert lexical non-future tense has also been posited for other languages, which, like Paraguayan Guarani, need a prospective morpheme for future reference (see §1.2.1). Of particular relevance, Thomas (2014) proposes that Mbyá Guarani – a language closely related to Paraguayan Guarani – has covert lexical non-future tense.[18] A null morpheme, RT (for 'reference time'), is said to be obligatory in matrix clauses in Mbyá, optional in relative clauses, and prohibited from complements of attitude verbs and adverbial clauses.[19] Its lexical meaning, is illustrated in (27) (Thomas 2014: (52)): RT is semantically a pronoun, with a lexical presupposition that its time reference is restricted to non-future times. The lexical restriction is motivated by the fact that prospective *-ta* is generally needed for future reference, as in Paraguayan Guarani.

(27) $[\![\text{RT}]\!]^{c,w}$ is defined only if c makes available an interval t_{rt} such that $\neg(t_{rt} > t_c)$. If defined, $[\![\text{RT}]\!]^{c,w} = t_{rt}$

Applied to Paraguayan Guarani (19a), this analysis yields the LF and interpretation in (28).

(28) a. $[_{CP}\ \text{RT}\ \lambda t\, \exists e\, [\, \text{sing}(w)(e)(kalo) \wedge \tau(e)\, \text{AT}\, t\ (\wedge\, t \subseteq now/yesterday)\,]]$
b. $[\![(28a)]\!]^{c,w}$ is defined only if c makes available an interval t_{rt} such that $\neg(t_{rt} > t_c)$. If defined, $[\![(28a)]\!]^{c,w} = 1$ iff
$\exists e\, [\, \text{sing}(w)(e)(kalo) \wedge\ \tau(e)\, \text{AT}\, t_{rt}\ (\wedge\, t_{rt} \subseteq now/yesterday)\,]]$

On this approach, the only differences from English, are that (i) Paraguayan Guarani has a single tense morpheme, non-future, instead of two, past and present; and (ii) its tense morpheme happens to be phonologically covert. Otherwise tense in both languages may not derive future reference alone, because of its lexical restriction, and needs the help of a prospective aspectual morpheme.

3.2.3 Covert lexical tense with no lexical restriction on temporal reference

This type of analysis is usually applied to languages where temporal reference is not constrained, i.e., verbs can have future reference without a prospective morpheme (e.g., Mucha 2013 for Hausa, Toosarvandani 2016 for Northern Paiute, Chen et al. 2021 for Javanese, a.o.). Temporal reference is obtained via a covert pronoun merged

[18] Tonhauser (2011a) posits a covert lexical tense with non-future semantics in Paraguayan Guarani as well, but the account is superseded by Tonhauser (2011b), which we just discussed.

[19] Thomas (2014) treats RT as an adverbial, but for other languages the null tense is syntactically projected in a Tense node.

in the syntactic structure, but this pronoun has no lexically-specified tense features and so it can refer to past, present or future times.

Of particular relevance here is that Bochnak (2016) and Mucha (2017) extend this approach to Washo and Medumba, respectively, which similarly to Paraguayan Guarani do not generally allow future reference for bare predicates, requiring a prospective aspectual marker. Instead of proposing covert non-future tense for Washo and Medumba, Bochnak (2016) and Mucha (2017) suggest a covert tense whose restriction to non-future times is not lexical but is at the level of discourse. The approach is illustrated in (29). The covert tense, T_i, is a pronoun that refers to a contextually determined reference time (via the assignment of a value to the index i by g in context c). A discourse restriction dictates that T_i cannot refer to a future time, much like in the analysis of Tonhauser (2011b) for Paraguayan Guarani.

(29) a. $[\![T_i]\!]^{g,c} = g(i)$
b. future times are not contextually available as referents for T_i (discourse restriction)

If the analysis for Washo and Medumba is applied to Paraguayan Guarani, T_i would saturate the time variable of aspect in an LF as in (10b). The sentence in (19a) would receive the analysis in (30).

(30) a. $[_{CP}\ T_i\ \lambda t\, \exists e\, [\,\text{sing}(e)(kalo) \wedge \tau(e)\ \text{AT}\ t\ (\wedge\, t \subseteq now/yesterday)\,]]$
b. $[\![(30a)]\!]^{g,c}$ is defined only if c makes available an interval $g(i)$; no intervals after t_c are available. If defined, $[\![(30a)]\!]^{g,c} = 1$ iff $\exists e\, [\,\text{sing}(e)(kalo) \wedge\ \tau(e)\ \text{AT}\ g(i)\ (\wedge\, g(i) \subseteq now/yesterday)\,]]$

On this type of approach, Paraguayan Guarani has syntactically represented lexical tense and differs from languages such as English in (i) its tense morpheme has no lexical restrictions, (ii) there are temporal restrictions at the discourse level, and (ii) its tense morpheme is phonologically covert.

3.3 Summary: tense and no-tense approaches to Paraguayan Guarani

We offer a summary of the three types of tense approaches, as they would apply to Paraguayan Guarani, and our no-tense alternative, in a uniform format for ease of comparison. For each approach, a) specifies the mechanism of temporal reference and b) specifies how temporal reference is restricted.

(31) Covert lexical tense with a lexical restriction on its reference (§3.2.2)
a. $[\![T_i]\!]^{g,c} = g(i)$
b. lexical restriction: $[\![\text{NON-FUT}]\!]^{g,c} = \lambda t$: no part of t is after t_c. t

(32) Covert lexical tense, no lexical restriction on its reference (§3.2.3)
a. $[\![T_i]\!]^{g,c} = g(i)$
b. discourse restriction: Absolute future reference times are not contextually available.

(33) No lexical tense, temporal reference via a semantic rule (§3.2.1)

a. the time variable of aspect is interpreted as a reference time anaphor t_{rt} via a rule
b. discourse restriction: Absolute future reference times are not contextually available.

(34) No lexical tense, no tense via a rule (§3.1)
a. evaluation-time-denoting *pro* binds the time variable of aspect; evaluation time shifts
b. narrative restriction: Forward evaluation time shift is restricted to narratives

We note that versions of (31) and (32) have been proposed for several other languages without obligatory overt tense, some of whose temporal profiles differ both from each other's and from that of Paraguayan Guarani. We do not claim that these accounts are wrong for the languages for which they have been developed. Neither do we object in principle to null pronominals (T_i) or to variation in the semantics of lexical features restricting such pronominals (e.g., NON-FUT, PAST), or to the possibility that such features are absent altogether. Our goal is to add (34) to the analytical possibilities concerning temporal reference, and to show its advantages for Paraguayan Giarani specifically. The account is in principle applicable to other languages that are empirically like Paraguayan Giarani, and it remains to be seen whether it can be extended to them. The account is not meant to apply universally and given the existence of overt tense, accounts that posit phonologically null tense (restricted or unrestricted) may indeed be better suited empirically for other languages.

3.4 Conceptual and empirical advantages of the no-tense account for Paraguayan Guarani

The tenseless account posits no special mechanisms: evaluation time shift is independently needed for the phenomenon of the narrative present. Additionally, this account has several conceptual and empirical advantages over the tense accounts. We start with the conceptual ones.

The tenseless account is more economical, as it posits no covert tense morphemes or semantic tense rules that deviate from strict compositionality. Such devices need to be well motivated, and in the absence of strong support, they need to be rejected in favor of the more parsimonious account. The tense accounts do not provide indisputable arguments in their favor, at least as applied to Paraguayan Guarani.

The strongest argument offered by the tense accounts is in support of covert tense with a lexical restriction, §3.2.2. Matthewson (2006) points out that the obligatory use of a prospective aspect for future reference is a strong argument for covert lexical non-future tense. The argument relies on a likely semantic universal: languages with overt tense do not describe future events with a future tense; instead, they commonly use a present tense and a prospective marker, e.g., English *woll* (Bochnak 2019, a.o.). The absence of a future tense among the world's languages would follow if there is a universal constraint on the possible lexical semantics of tense, as has been suggested by Abusch (1997). This empirically-motivated restriction on the possible meaning of

tense would be expected to apply to covert tense as well. The fact that bare verbs cannot be interpreted as future, would directly follow if such verbs have tense: the lexical semantics of their covert tense is prohibited, by the universal semantic principle, from denoting future times. This argument is indeed convincing, but only if no alternative is offered. In §3.1.2 we suggested that evaluation time shift is restricted to narratives, in both Paraguayan Guarani and English, and the narrative restriction is relaxed in Paraguayan Guarani only in the case of reference to the past. Outside of narratives, a prospective morpheme is needed for future reference in both languages, for the same reason: forward evaluation time shift cannot apply to free standing clauses. Given this independent, empirically-motivated constraint on evaluation time shift, an account positing covert lexical tense no longer has an a priori conceptual advantage.

The argument from independent constraints on semantic tense is moreover undermined by some of the accounts that posit lexical tense yet maintain that the non-future restriction is not lexical, §3.2.3. The particular discourse restriction, also shared by the tense-via-a-rule account, §3.2.1, is itself problematic: it stipulates cross-linguistic variation at an unlikely level and of an unusual nature. Lexical restrictions on pronouns (e.g. gender features) constrain what kind of individuals the pronouns can refer to; the individuals themselves are not unavailable for reference. Any cross-linguistic restriction is localized in the lexical features that pronouns have. On the accounts in §3.2.1 and §3.2.3, the reverse is proposed: the referents – future times – are contextually unavailable, while the linguistic form itself – the tense – is not lexically restricted. Correspondingly, variation needs to be at the discourse level, specifically in whether future times can be referred to or not, and it is really not clear that languages should even have such restrictions in the first place, let alone differ this way.[20,21]

So, from a purely conceptual standpoint, only the account positing covert tense with a lexical restriction, §3.2.2, is a strong contender, yet our no-tense account offers an independently supported alternative, in addition to its parsimony.

The unspoken motivation of all types of accounts that posit tense, whether lexical or via a rule, seems to be the belief that tense is a semantic universal. Finding linguistic universals is indeed important, and this is why questioning whether any putative universal is a real one is imperative. On the account we advance here, tense is not a linguistic universal: it is possible for a language to not have lexical tense and no tense at the level of syntax or the post-syntactic semantic component either.

Related to the point of universality is the question of acquisition: what would constitute evidence to a child learner for positing covert tense, apart from a pre-existing

[20] Bochnak (2016): 271 suggests that the asymmetry between past and future times as potential discourse referents is rooted in their different status in a branching times model. We do not find this conjecture to be on the right track. In particular, reference to future times is possible for adverbs like *then*, in addition to *tomorrow at 10am*, *next Monday*. The way our conception of time is structured cannot be the ultimate explanation for the absence of overt future tenses and the impossibility of reference to future times with covert tenses, and moreover that conception should be universal, not subject to variation across languages. Rather, the answer must lie in the linguistic devices themselves that languages use, whether lexical expressions (tense vs. adverb) or mechanisms (evaluation time shift).

[21] We do not object to pragmatic constraints on temporal reference in general. For instance, Mucha (2013), building on Smith et al. (2007), suggests that present, past and future reference form a hierarchy of increasing conceptual complexity, which, in conjunction with the contribution of viewpoint aspect, influences how the lexically unrestricted null temporal pronoun in Hausa is interpreted.

expectation for tense? Interpretation alone is not sufficient, as either covert tense or evaluation time shift can explain the observation that bare predicates may be used in contexts requiring past interpretation. If tense is not a semantic universal, and positive evidence is needed for a child to posit tense, in the form of an overt morpheme, then such evidence is lacking in Paraguayan Guarani.[22] The mechanism of evaluation time shift, on the other hand, is not tied to a lexical item. Evaluation relative to a context is, arguably, universal, and we suggest that evaluation relative to a context other than the speech time is an universally-available option too.

In addition to the conceptual advantage of economy, the independent support from constraints on evaluation time shift, and the implications for linguistic universals and acquisition, our account also has clear empirical advantages in three areas, listed in (35a), (35b) and (35c) with the sections where we discuss them. All three directly speak to the absence of tense, and the last two also address properties of default and shifted evaluation times. Additionally, we identify a fourth area where our account appears to be empirically superior to accounts that posit tense, listed in (35d); however, the evidence is not unequivocal, and so we present it in an Appendix.

(35) a. temporal interpretation of attitude complements, §5
b. future reference without prospective *-ta*, §6.3.1
c. future-in-the-past interpretations, §6.3.2
d. simultaneous reference to past and present sub-events, Appendix

4 Temporal interpretation in Paraguayan Guarani: the role of aspect

As a first step of justifying our formal account of temporal reference in Paraguayan Guarani without a role for tense, we describe some key facts about temporal interpretation in this language. We mostly focus on verbs that do not have overt aspectual morphemes ('bare verbs') like those in (1), and we argue that they in fact have covert viewpoint aspect. We also discuss verbs marked with continuous *hína*, as in (2c), and verbs marked with the modal prospective *-ta*, as in (2a). We also consider the semantic contribution of *kuri*, as in (2b) which we analyze as a retrospective aspectual marker. We thus illustrate that Paraguayan Guarani has viewpoint and high aspects. We address temporal interpretation in matrix clauses, and in clauses embedded under attitude verbs, leaving the discussion of relative clauses (as well as conditionals, *because*-clauses, and other adjunct clauses) to another occasion. We also do not address the temporal contribution of evidential morphemes *ra'e* and *raka'e* (for that, see Pancheva & Zubizarreta).

[22] This is not to say that null morphemes in general may not be learned. If they contrast with overt morphemes in a paradigm, as is the case for the English present vs. past tense tense on main verbs, this is relevant positive evidence. Null morphemes may also be posited when there is no alternative mechanism for delivering an interpretation: we posited null viewpoint aspect, to allow for the transformation of predicates of events into predicates of times, on the assumption that analytically, it is a preferred mechanism to type-shifting, and so, by hypothesis, the only available mechanism to learners.

4.1 Bare verbs, aktionsart effects, continuous *hína*, and covert viewpoint aspect

Verbs that are not overtly marked for aspect generally allow both present and past, but not future, interpretation. We saw this already in the case of the activity verb *bathe* in (1). Accordingly, such bare verbs may be modified by both present- and past-oriented temporal adverbials, but only verbs marked with prospective *-ta* may be modified by future-oriented adverbials. See (36) with activity *sing* and (37) with stative *be sick*.[23]

(36) a. Kuehe a-purahéi.
yesterday 1SG-sing
'Yesterday I sang.'

b. Ko'ãga a-purahéi.
now 1SG-sing
'Now I am singing.'

c. Ko'ẽrõ a-purahéi #(*-ta*).
tomorrow 1SG-sing(-PROSP)
'Tomorrow I will sing.'

(37) a. Kuehe Kalo hasy.
yesterday Kalo 3.sick
'Yesterday Kalo was sick.'

b. Ko'ãga Kalo hasy.
now Kalo 3.sick
'Now Kalo is sick.'

c. Ko'ẽrõ Kalo hasy #(*-ta*).
tomorrow Kalo 3.sick(-PROSP)
'Tomorrow Kalo will be sick.'

Telic predicates also need prospective *ta-* for future reference. When bare, telic predicates can be interpreted as past, but for present interpretation the continuous aspectual morpheme *hína*[24] is required, unlike the case of atelic predicates. These facts are illustrated in (38) with the telic *go to the market*.

[23] Paraguayan Guarani has a class of stems known as *triformes* whose initial consonant varies with grammatical context, e.g., *tova, rova, hova* 'face', *techa, recha, hecha* 'sight, see', *tory, rory, hory* 'happiness, (be) happy'. The predicate in (37) is of this kind: *tasy, rasy, hasy* 'sickness, be sick'. The *t*-initial form is a noun outside of possessive contexts; the *r* / *h* distinction reflects factors such as the status of the form as a predicate vs. a noun with a possessor, the person features of the subject of predication or possessor, and the direct vs. inverse alignment of the clause. See Zubizarreta & Pancheva (2017b) for an analysis of *triformes*.

[24] *Hína* is the 3rd person form of a functional item that agrees with the subject in person and, for 1st and 2nd person, number. While the inflectional paradigm is being lost in favor of a single non-agreeing form, the inflected form is still recognized, and one of our primary consultants uses it regularly. The morpheme doesn't have a fixed position and has a focusing property with respect to the constituent to its left (with which it generally forms a prosodic unit), and appears to add a nuance of stronger certainty. The continuous aspectual meaning arises when *hína* focuses on the root to its immediate left. The temporal contribution may be entirely absent, with only the focusing (and certainty-expressing) function surviving. We abstract away from the non-temporal properties of *hína* in this article.

(38) a. Kuehe a-ha mercado-pe.
yesterday 1SG-go market-LOC
'Yesterday I went to the market.'

b. Ko'ãga a-ha *hína* mercado-pe.
now 1SG-go CONT market-LOC
'Now I am going to the market.'

c. # Ko'ãga a-ha mercado-pe.
now 1SG-go market-LOC
'Now I am going to the market.'

d. Ko'ẽrõ a-ha #(*-ta*) mercado-pe.
tomorrow 1SG-go(-PROSP) market-LOC
'Tomorrow I will go to the market.'

The same facts obtain in the absence of direct modification by time adverbials. Discourses that make a present or past time salient license present and past interpretations of bare verbs. The questions in (39) can be answered with the same overtly tenseless sentences, which will be appropriately interpreted as either present or past, depending on the context set up by the question. However, a salient future time does not permit a bare predicate to be interpreted as future; the prospective marker *-ta* is necessary, (40). Telic predicates behave as expected: they require *hina* for present reference, as well as *-ta* for future reference.

(39) a. 'Why isn't Kalo at the office today?' /
'Why didn't Kalo come to the office last week?'

b. Kalo hasy.
Kalo 3.sick
'Kalo is/was sick.'

c. Kalo o-mba'apo hoga guive.
Kalo 3-work 3.house from
'Kalo is working/worked from home.'

(40) a. 'Will Kalo come to the office tomorrow?'

b. Kalo hasy#(*-ta*).
Kalo 3.sick(-PROSP)
'Kalo will be sick.'

c. Kalo o-mba'apó#(*-ta*) hoga guive.
Kalo 3-work(-PROSP) 3.house from
'Kalo will work from home.'

The above examples identify two key facts about temporal reference in Paraguayan Guarani.

(41) a. For future reference, prospective aspect *-ta* is necessary (though see §4.2 for a refinement)
b. For present episodic reference, continuous aspect *hína* is necessary with telic predicates

The theory of temporal reference without tense, developed in this paper, explains (41a). To understand (41b), let us consider the role of aktionsart further. The temporal interpretation of telic and atelic bare predicates diverges: telic predicates like *go to*

the market cannot be interpreted as ongoing at the speech time without *hína* but this is not the case for atelic eventive predicates like *sing* or *bathe*, nor for statives like *be sick*. That statives do not require *hína* is not surprising[25] but that there is a split between telic and atelic eventives is unexpected, at least from the perspective of English. In English, all eventive predicates, whether telic or atelic, require the progressive for episodic reference in the present, (42); without the progressive they can only be interpreted as habitual.

(42) a. *habitual*
I sing.
I go to the market.

b. *episodic*
I am singing.
I am going to the market.

c. *episodic, habitual*
I sang.
I went to the market.

The restrictions in English can be accounted for as follows. The language has covert habitual and perfective viewpoint aspects.[26] In the absence of the progressive morpheme, dynamic predicates in the simple present (*sing*, *go to the market*) and the simple past (*sang*, *went to the market*) can in principle be marked with either perfective or habitual viewpoint aspect (since both aspects are covert). The ambiguity survives in the past tense, but in the present tense perfective aspect is blocked by a cross-linguistic *present perfective restriction* (Comrie 1976, Smith 1997, Giorgi & Pianesi 1997, De Wit 2016, a.o.).[27] And because dynamic predicates in the simple present tense cannot be marked perfective, they cannot describe episodic events. The only possible structure, realized as the simple present rather than the present progressive, is the one where the dynamic predicates have covert habitual aspect.

This line of analysis for English suggests a similar account for the aktionsart effects in Paraguayan Guarani. If the language has covert perfective aspect, telic predi-

[25] *Hína* is compatible with states, see (i). This is congruent with its focus properties, but is also indicative that it is a continuous aspect rather than a progressive.

(i) Kalo hasy hína.
Kalo 3.sick CONT
'Kalo is sick.'

[26] Or alternatively, a single underspecified covert aspect is interpreted as a habitual or as a perfective, with eventive predicates.

[27] A common explanation for the incompatibility between present tense and perfective viewpoint aspect is that the speech time is grammatically represented as being of a very short duration, too short to accommodate perfective aspect (Bennett & Partee 1978, Kamp & Reyle 1993, Smith 1997:110, Wyngaerd 2005, a.o.). Because present tense contributes the meaning that the reference time equals the speech time, a present reference time is too short of an interval to include the event time. We do not, however, adopt this explanation, siding instead with Ogihara (2007), who attributes the present perfective restriction to the requirement that eventualities have to hold not *at* but *throughout* the speech time. It then follows that dynamic predicates need to combine with progressive/imperfective aspect to be able to express events ongoing at the speech time.

cates marked with the covert perfective aspect (and thus appearing to be bare) should be interpreted only as past, given that perfective aspect is incompatible with present reference. The same facts would follow if the covert aspect is not strictly perfective, but underspecified, and interpreted as perfective when in combination with telic predicates. Note that the explanation for the present perfective restriction relies on the present tense only as much as this tense delivers a reference time that is the same as the speech time. In the absence of a present tense the restriction would still follow given the grammatical properties of the speech time and the meaning of perfective aspect. Thus we see a reason to posit covert viewpoint aspect in Paraguayan Guarani. Bare telic predicates are not aspect-less. The covert aspect that they are marked with is interpreted as perfective.

Consequently, in order to have a uniform theory of temporal interpretation, atelic bare predicates too have to be analyzed as being aspectually marked, but the covert aspect can be either perfective or imperfective. This conclusion is in line with Tonhauser (2006): §7.2, Tonhauser (2011b): 262-263, 265-266, who suggests that bare verbs in Paraguayan Guarani are marked with a non-overt aspectual morpheme with an underspecified meaning contributing an AT relation, which may be further restricted to perfective or imperfective, depending on aktionsart and context. We only need to add that with telic predicates the null aspect is interpreted perfectively, whereas with atelic predicates it may also receive an imperfective interpretation.[28]

We illustrate below the meanings of the atelic vP *a-purahéi* 'I sing' and the telic vP *a-ha mercado-pe* 'I go to the market', (43). We also show the lexical semantics of the continuous viewpoint aspect *hína*, (44), and of the underspecified covert viewpoint aspect, (45). In (45a)-(45b) we further illustrate the interpretation of the covert viewpoint aspect in the context of atelic and telic predicates.

(43) a. $[\![\, \textit{a-purahéi} \,]\!]^c = \lambda e\,[\,\text{sing}(e)(\textit{speaker}_c)\,]$
b. $[\![\, \textit{a-ha mercado-pe} \,]\!]^c = \lambda e\,[\,\text{go-to-the-market}(e)(\textit{speaker}_c)\,]$

(44) $[\![\, \textit{hína} \,]\!] = \lambda P_{\langle v,t\rangle}\, \lambda t\, \exists e\,[\,P(e) \wedge t \subset \tau(e)\,]$

(45) $[\![\, \text{ASP}_{\varnothing} \,]\!] = \lambda P_{\langle v,t\rangle}\, \lambda t\, \exists e\,[\,P(e) \wedge \tau(e)\,\text{AT}\,t\,]$ $\quad (t\,\text{AT}\,t' \text{ iff } t \subseteq t' \vee t' \subset t)$
a. $[\![\, \text{ASP}_{\varnothing}\ \textit{a-purahéi} \,]\!]^c = \lambda t\, \exists e\,[\,\text{sing}(e)(\textit{speaker}_c) \wedge \tau(e)\,\text{AT}\,t\,]$ (perfective or imperfective)
b. $[\![\, \text{ASP}_{\varnothing}\ \textit{a-ha mercado-pe} \,]\!]^c = \lambda t\, \exists e\,[\,\text{go-to-the-market}(e)(\textit{speaker}_c) \wedge \tau(e) \subseteq t\,]$ (perfective)

Atelic predicates can describe events that are ongoing at the speech time because they allow for $\text{ASP}_{\varnothing}$ to be interpreted imperfectively, as (46) illustrates. Present or past interpretation ('I am/was singing') depends on whether *pro* is interpreted as denoting the speech time, t_s or a shifted evaluation time t_n, when $t_n < t_s$.

[28] The null aspect can also be interpreted habitually; we do not illustrate this here. Paraguayan Guarani also has an overt habitual aspect morphemes, *-va* (for ongoing habits) and *-mi* (for habits that no longer hold).

(i) a. A-ha-*va* mercádo-pe
1-go-HAB market-LOC
'I go to the market.'

b. A-ha-*mi* mercádo-pe
1-go-HAB market-LOC
'I used to go to the market.'

(46) $[\![\,[_{CP}\ pro$ ... ASP$_{\varnothing}$ *a-purahéi* $]\,]\!]^{s,n} = 1$ iff
$\exists e\,[\,\text{sing}(e)(speaker_s) \wedge t_s \subset \tau(e)\,]$ or $\exists e\,[\,\text{sing}(e)(speaker_s) \wedge t_n \subset \tau(e)\,]$

In the absence of an imperfective interpretation (and putting aside habitual interpretation), bare telic predicates may not be interpreted as describing events that are ongoing at the speech time: in (47) ('I go to the market') the perfective interpretation of ASP$_{\varnothing}$ dictates that the time of the event is included in the speech time, which is independently precluded. Only the past perfective interpretation is possible, with *pro* denoting a shifted evaluation time t_n, $t_n < t_s$. Importantly, we do not claim that t_n is a longer interval than t_s, since we adopt the position that the length of t_s is not what is behind the present perfective restriction in the first place (see footnote 27).

(47) $[\![\,[_{CP}\ pro$ ... ASP$_{\varnothing}$ *a-ho mercado-pe* $]\,]\!]^{s,n} = 1$ iff
$^{\#}\exists e\,[\,\text{go-to-the-market}(e)(speaker_s) \wedge \tau(e) \subseteq t_s\,]$ or
$\exists e\,[\,\text{go-to-the-market}(e)(speaker_s) \wedge \tau(e) \subseteq t_n\,]$

4.2 Prospective *-ta*

As discussed above, the suffix *-ta* is obligatory for reference to times that are in the future of the speech time (with some principled exceptions and putting aside sentences with modals). Tonhauser (2006, 2011a) argues that *-ta* is not a future tense marker but rather an aspectual prospective marker (and a modal), because it is acceptable in both matrix and embedded clauses with past temporal reference, yielding a future-in-the-past interpretation. In (48) (from Pancheva & Zubizarreta: (16)), the reported speech event is on June 6th; the event described in the embedded clause, María getting married, is located, with the help of *-ta*, in the future of that (i.e., on June 7th), but it is still in the past relative to the speech time (itself on June 8th). In (49), the first clause establishes a salient past time, when the event of the speaker meeting María happens. The event in the second clause is then located to the future of that past time, but still before the speech time, on the most natural interpretation.

(48) *María said to S on June 6th: "I will get married tomorrow." S reports on June 8th:*

A-je-topá-rõ María ndive, o-mombe'u chéve o-mendá-*ta*
1SG-REFL-met-CONJ Maria with, 3-tell me.DAT 3-marry-PROSP
-ha kuehe.
SUBORD yesterday
'When I met María, she told me that she was going to get married yesterday.

(49) O-japo mbohapy jasy che a-je-juhu María ndive. Ha'e
3-make three month I 1SG-REFL-find María with. She
o-viaja-*ta* Buenos Aires-pe.
3-travel-PROSP Buenos Aires-to
'Three months ago, I met María. She was about to travel to Buenos Aires.'

In addition to encoding prospective aspect, *-ta* also has a modal component, expressing intentions and predictions (Tonhauser 2011a,b).[29] In that sense it is similar to the English modal prospective *woll* (Abusch 1997).[30] We put the issue of modality aside in this paper. The aspectual component of the meaning of *-ta* can be represented in at least two ways, as a high aspect or a viewpoint aspect. The high aspect meaning, as a modifier of predicates of times, can be seen in (50a) (Tonhauser 2011a,b, Pancheva & Zubizarreta 2020), the same as the meaning attributed to *woll* in Abusch (1997). Alternatively, the prospective contribution of *-ta* may be as a viewpoint aspect, as in (50b). The morpho-syntactic distribution of *-ta* (very low in the structure, as shown in Zubizarreta 2022), favors the viewpoint aspect analysis. Another advantage of the viewpoint analysis is that the relative scope of *-ta* and *kuri* need not be stipulated: *kuri*, as a high aspect, will naturally take scope with respect to *-ta*. We will not discuss further the analysis of *-ta*; what matters here is that *-ta* is an aspect which contributes a relative future time.[31]

(50) a. $[\![\textit{-ta}]\!] = \lambda p_{\langle i,t \rangle}\, \lambda t\, \exists t' [t < t' \wedge p(t')]$
b. $[\![\textit{-ta}]\!] = \lambda P_{\langle v,t \rangle}\, \lambda t\, \exists e [P(e) \wedge t < \tau(e)]$

An illustration is offered in (51). The LF in (51b) yields the interpretation in (51c). Here, unlike in (19c), *pro* may only denote the actual speech time t_s. We propose that this is because, unlike the case of the past, evaluation time shift is restricted to narrative contexts in the case of the future and so does not apply to individual statements like (51a).

(51) a. Kalo o-purahéi-*ta* (ko'ẽro).
Kalo 3-sing-PROSP tomorrow
'Kalo will sing (tomorrow).'

b. $[_{CP}\ \textit{pro} \ldots\ \lambda t\, \exists t' \exists e [\text{sing}(e)(\textit{kalo}) \wedge \tau(e)\ \text{AT}\ t' \wedge t < t'$
$(\wedge\, t' \subseteq \textit{tomorrow})]]$

c. $[\![\textit{pro}]\!]^{s,n} = t_s$; $[\![(51\text{b})]\!]^{s,n} = 1$ iff
$\exists t' \exists e [\text{sing}(e)(\textit{kalo}) \wedge \tau(e)\ \text{AT}\ t' \wedge t_s < t' (\wedge\, t' \subseteq \text{the day after } t_s)]]$

[29] Less common but possible for some speakers is an epistemic/conjectural meaning, perhaps due to Spanish influence. Tonhauser (2011a) reports such cases as unacceptable.

(i) Q: Why didn't Maria come?
A: Hasy-*ta* piko?
3.sick-PROSP Q
'She might be sick?'

[30] The two meaning components of English *woll* are sometimes represented by two distinct morphemes, a modal *woll* and a phonologically covert prospective aspect; in some languages both components may be overtly realized (see Bochnak 2019).

[31] The analysis of *-ta* as a high aspect suggests that seemingly bare predicates marked with *-ta* are in fact already marked with a null viewpoint aspect $\text{ASP}_{\varnothing}$, as in (i).

(i) a. A-karú-∅-*ta*.
1SG-eat-$\text{ASP}_{\varnothing}$-PROSP
'I will eat.'

b. Kalo o-hó-∅-*ta* mercádo-pe.
Kalo 3-go-$\text{ASP}_{\varnothing}$-PROSP market-LOC
'Kalo will go to the market.'

We will not be representing a null viewpoint aspect below *-ta* in the morphological analysis of the examples. The logical formulas suppress information as to whether the meaning contribution is of *-ta* alone, or of *-ta* in conjunction with a null viewpoint aspect.

Although *-ta* is obligatory in free-standing clauses, including in question-answer contexts, as seen earlier in (36), (37), (38), and (40), there is an environment where future reference can obtain without *-ta*. In narratives – sequences of two or more main clauses – *-ta* may be omitted in some or all of those clauses, whether they are separate sentences, or conjuncts in a single sentence. The possibility of omitting *-ta* in non-initial conjuncts in coordinations has been noted by Tonhauser (2011b). Pancheva & Zubizarreta (2020) generalize the optionality of *-ta* in coordinations to narratives and link it to the phenomenon of the narrative present in languages with tense. The proposal is that only narratives allow future evaluation time shift. This is illustrated in (52a). When *pro* denotes t_n, where $t_n > t_s$, *-ta* does not need to appear.

(52) a. *Context: Imagine our first day of vacation tomorrow*

Ko'ẽro ja-ha mercado-pe, ja-karu nde sy róga-pe,
tomorrow 1INCL-go market-LOC 1INCL-eat 2POSS mom house-LOC
ha upérire ja-ha Altos-pe
and then 1INCL-go Altos-LOC

'Tomorrow, we go to the market, we eat at your mom's house, and then we go to Altos'

b. $[_{CP}\ pro \ldots \lambda t\, \exists e\, [\text{go to market}(e)(we) \wedge \tau(e)\ \text{AT}\ t \wedge t \subseteq tomorrow\,]]$

c. $[\![\, pro \,]\!]^{s,n} = t_n; t_n > t_s; [\![\, (52b) \,]\!]^{s,n} = 1$ iff
$\exists e\, [\text{go to market}(e)(we) \wedge \tau(e)\ \text{AT}\ t_n \wedge t_n \subseteq \text{the day after } t_s\,]]$

Sentences with and without *-ta* are not semantically equivalent, given that *-ta* contributes prediction/certainty (the modal part of its meaning), which is absent in sentences without *-ta*. The same is true for a canonical future narrative with *woll* in English vs. a future narrative in the narrative present mode, cf. (5).

4.3 Retrospective *kuri*

The free morpheme *kuri* restricts temporal reference to times prior to the speech time, see (53).[32,33]

(53) a. María o-purahéi *kuri*.
María 3-sing KURI

[32] Sometimes, for some speakers, as also noted in Tonhauser (2006), the presence of *kuri* further contributes the meaning that the described event is in the recent past. Such a recency meaning doesn't always arise, as *kuri* is readily compatible with a past adverbial like *yma* 'long time ago', as in (i).

(i) A-je-juhu ramoguare María-ndive ymá-ma o-menda *kuri*.
1SG-REFL-meet PAST.TEMP María-with long.time-ALREADY 3-marry KURI
'When I met María, she had already married long time ago.'

[33] *Kuri* is a mobile morpheme that also has focusing properties (and possibly 'best-evidence' evidential meaning). Evidentials like *ra'e* and *raka'e* also have focusing properties, as well as the previously discussed *hína*. This focusing property of evidentials and morphemes with a temporal function is quite common in the language. While we abstract away here from these other functions of *kuri*, it is important to note that, because of them, sentences such as the ones in (53a)-(53b) are not equivalent to their counterparts without *kuri*, even when those receive past interpretation. The bare form and the form with *kuri* are not in free competition to the extent that *kuri* contributes other nuances to the meaning of the sentence.

'María sang.'

b. María hasy *kuri*.
María 3.sick KURI
'María was sick.'

c. María o-purahéi-*ta* *kuri*.
María 3-sing-PROSP KURI
'María was going to sing.'

Kuri presents a challenge for the absence of lexical tense in Paraguayan Guarani. The examples so far are compatible with *kuri* being an 'optional' past tense. If that were so, it would lend support to analyzing clauses without *kuri* as having covert tense, rather than no lexical tense. If the language were to have clauses with overt tense and others with no tense, temporal reference would have to be accomplished via two different mechanisms, clearly an undesirable result.

Kuri has been said to be a past tense (Liuzzi & Kirtchuk 1989), a past adverb (Tonhauser 2011b, Thomas 2014), or alternatively, a retrospective aspect, i.e., a type of high aspect (Pancheva & Zubizarreta 2020), but no arguments have been offered for these specific proposals.[34] We suggest that the lexical semantics of *kuri* is as in (54). This meaning is a weaker variant of the strictly retrospective meaning from Pancheva & Zubizarreta (2020) and is the meaning proposed for the perfect in English, seen earlier in (7b). *Kuri* introduces an interval, t' in (54), which, for ease of reference, we will call the *kuri time span*, on analogy with the *perfect time span*. The *kuri* time span fully precedes the time argument of *kuri*, t in (54), or includes t as a final subinterval, and t is eventually bound by the evaluation-time denoting *pro*.

(54) $[\![kuri]\!] = \lambda p_{\langle i,t \rangle} \lambda t \exists t' [t' \leq t \wedge p(t')]$ $(t' \leq t$ iff $\neg \exists t'' [t'' \subset t' \wedge t'' > t])$

Here we present two arguments in favor of such a meaning for *kuri*, and in §5 we present a third argument.

4.3.1 Extended now readings

When *kuri*'s time argument is bound by a speech-time denoting *pro*, the resulting meaning is close to that of an English present perfect. The meanings are not identical, because in the English present perfect the perfect time span needs to include the speech time,[35] while the *kuri* time span may precede the speech time or may include it. The availability of universal perfect readings, where a state is asserted to hold throughout the perfect time span, including the speech time, serves to distinguish a present perfect from a past. The same holds for *kuri*. We see in (55) that such readings

[34] Liuzzi & Kirtchuk (1989) include *kuri* among the 'morfemas retrospectivos' rather than the 'morfemas aspectuales', and their informal description suggests that they have in mind an analysis of *kuri* as a past tense, although nothing they say would preclude an account of *kuri* as a high retrospective aspect.

[35] See Pancheva & von Stechow (2004) for an account on how the weaker meaning of the perfect is grammatically strengthened in the context of present tense in English. This strengthening cannot happen in Paraguayan Guarani because of the absence of lexical tenses that are in competition at the same syntactic node.

are available in the presence of *kuri*, which is what the account in (54) predicts, and the analyses in terms of a past tense or a past adverbial do not.

(55) (O-japo) 15 diá=ma che rasy kuri ha che rasy gueteri
(3-make) 15 day=already I 1SG.sick RETROSP and I 1SG.sick still
ko'ağa.
now
'It's been 15 days that I have been sick and I am still sick now.'

We thus expect that environments which require a universal perfect interpretation in English or Spanish would show a preference for the use of *kuri*. We asked 20 bilingual participants to judge the acceptability of Paraguayan Guarani sentences and their Spanish counterparts, allowing a comparison between the use of *kuri* and the present perfect in Spanish. The sentences were presented in written form (as part of a larger questionnaire), and participants had the option to select one, both/all, or neither sentence. The sentences had stative predicates modified by adverbials that, in the presence of a perfect, favor the universal perfect interpretation in English.

The first item pair can be seen in (56) and (57). When an individual-level stative predicate like *be short* is modified by *always*, a present interpretation is not felicitous. We thus expect (56a) to be interpreted as past, rather than present. However, the past too should be dis-preferred, as when out of context, it implies that the stative predicate no longer holds of the subject.[36]

(56) *Prompt: Which sentence(s) seem(s) to you possible?*

a. Akóinte Juana i-michĩmi ha i-michĩmi gueteri.
always Juana 3-short and 3-short still
'Juana is/was always short and is still short.' *selected by 5/20*

b. Akóinte Juana i-michĩmi *kuri* ha i-michĩmi gueteri.
always Juana 3-short KURI and 3-short still
'Juana has always been short and is still short.' *selected by 14/20*

(57) *Prompt: Which sentence(s) seem(s) to you possible?*

a. Siempre Juana fue baja y todavía lo es.
always Juana be.PAST.3SG short and still it be.PRES.3SG
'Juana was always short and is still short.' *selected by 3/20*

b. Siempre Juana ha sido baja y todavía lo
always Juana have.PRES.3SG be.PART short and still it
es.
be.PRES.3SG
'Juana has always been short and is still short.' *selected by 17/20*

[36] With context, such effects do not obtain, as in the following well-known example from Klein (1994):

(i) a. What did you notice when you looked into the room?
b. There was a book on the table. It was in Russian.

As can be seen from the selection results, there was an overwhelming preference for the sentence with *kuri*, (56b), which mirrors closely the preference for the present perfect in the Spanish (57b).[37]. These results favor the analysis of *kuri* as a (weak) retrospective aspect and make the past-tense analysis less likely.

The second item pair is illustrated in (58) and (59).

(58) *Prompt: Which sentence(s) seem(s) to you possible?*

a. Año 2000 guive, a-iko Paraguaý-pe ha a-iko gueteri.
year 2000 from 1SG-live Paraguay-LOC and 1SG-live still
'From 2000 I live(d) in Paraguay and I still do.' *selected by 14/20*

b. Año 2000 guive, a-iko *kuri* Paraguaý-pe ha a-iko gueteri.
year 2000 from 1SG-live KURI Paraguay-LOC and 1SG-live still
'Since 2000 I have lived in Paraguay and I still do.' *selected by 8/20*

(59) *Prompt: Which sentence(s) seem(s) to you possible?*

a. Desde el 2000 viví en Paraguay y hasta ahora
from the 2000 live.PAST.1SG in Paraguay and until now
vivo en este país.
live.PRES.1SG in this country
'From 2000 I lived in Paraguay and up till now I live in this country.'
selected by 0/20

b. Desde el 2000 he vivido en Paraguay y hasta
from the 2000 have.PRES.1SG live.PART in Paraguay and until
ahora vivo en este país.
now live.PRES.1SG in this country
'Since 2000 I have lived in Paraguay and up till now I live in this country.' *selected by 12/20*

c. Desde el 2000 vivo en Paraguay y hasta ahora
from the 2000 live.PRES.1SG in Paraguay and until now
vivo en este país.
live.PRES.1SG in this country
'From 2000 I live in Paraguay and up till now I live in this country.'
selected by 8/20

We also illustrate participants' linked responses in the two languages. The results for the first item pair (56)-(57) are shown in Table 1 and those for the second item pair (58)-(59) are shown in Table 2. For instance, 12 participants who chose the present perfect sentence in Spanish also chose the sentence with *kuri* in Paraguayan Guarani (Table 1, row c.). The weak retrospective semantics for *kuri* in (54) makes it suitable as the primary counterpart of the present perfect in these Spanish sentences, but it also does not preclude a past interpretation, given that the *kuri* time span can be before the

[37] One participant selected both Paraguayan Guarani sentences as acceptable and two participants indicated that neither of these sentences is acceptable. Of the three participants who selected Spanish (57a) one also selected Paraguayan Guarani (56a)

time bound by the evaluation-time-denoting *pro* or it can extend to it and include it as a final subinterval. In contrast, a past tense marker would not result in this pairing with the Spanish temporal expressions.

	# participants	Paraguayan Spanish	Paraguayan Guarani
a.	1	past	∅
b.	2	past	*kuri*
c.	12	present perfect	*kuri*
d.	4	present perfect	∅

Table 1 Within-participant responses to (56)-(57) by 20 bilingual speakers

	# participants	Paraguayan Spanish	Paraguayan Guarani
a.	8	present	∅
b.	1	present	*kuri*
c.	7	present perfect	*kuri*
d.	6	present perfect	∅

Table 2 Within-participant responses to (58)-(59) by 20 bilingual speakers

4.3.2 Ambiguities of adverbial modification

The semantics in (54) predicts that in the presence of temporal adverbials *kuri* should allow ambiguities of the kind found with the English past perfect. The sentence in (60) has two interpretations, depending on which time interval the adverbial modifies. According to one of the readings, the event happened at 5 o'clock. The LF for that reading is in (60a): here the adverbial modifies the predicate of times supplied by perfective aspect and thus effectively restricts the time of the event. The perfect subsequently binds the time variable of perfective aspect, with the result that the perfect time span is at 5 o'clock and is also before the past reference time contributed by the past tense. According to the second reading, the past reference time is at 5 o'clock. This reading is provided by the LF in (60b) where the adverbial restricts the predicate of times that the perfect time span precedes or includes as final subintervals. The past tense then binds the time variable of perfect, with the result that the past reference time of the sentence is at 5 o'clock. The second interpretation is harder to access, particularly with a post-VP placement of the adverbial; some native speakers only get this reading when preposing the adverb to the beginning of the sentence.

(60) Maria had left the house at 5.

a. [*pro* [PAST [PERFECT [at 5 [PERFECTIVE [Maria leave the house]]]]]]

b. [*pro* [PAST [at 5 [PERFECT [PERFECTIVE [Maria leave the house]]]]]]

We expect the same ambiguities in the case of *kuri*. We tested the prediction in two questionnaires, completed by bilingual speakers of Paraguayan Guarani and Spanish. In both questionnaires we asked the participants to judge whether sentences in Paraguayan Guarani are appropriate in contexts given in Spanish.

In the first questionnaire, which was read to the participants by a native-speaker consultant, we presented the contexts in (61) first and asked whether each of the sentences in (62), which contain *kuri* and differ only in the position of the time adverbial, is acceptable in these contexts. Participants could select one or the other context, or both contexts.

(61) a. *Context A: Kalo left before five.*
b. *Context B: Kalo left at five sharp.*

(62) a. La cinco Kalo o-sẽ *kuri* hóga-gui.
the five Kalo 3-leave KURI house-from
'At five o'clock Kalo left the house.' /
'At five o'clock Kalo was gone from the house.'
7/8 selected both Context A and Context B;
1/8 selected only Context B

b. Kalo o-sẽ *kuri* la cinco hóga-gui.
Kalo 3-leave KURI the five house-from
'At five o'clock Kalo left the house.' /
'At five o'clock Kalo was gone from the house.'
6/8 selected both Context A and Context B;
2/8 selected only Context B

Eight participants completed the task. As seen above, the great majority of them chose both contexts as appropriate, for each of the two sentences. One participant showed an effect of adverb placement of the kind seen in English, choosing both contexts for (62a) but only Context B for (62b).[38] These results confirm that *kuri* introduces an additional time interval that can be modified by the adverbial, making the sentence structurally ambiguous. An analysis of *kuri* as a past adverb or an optional past tense predicts that the sentence should not be ambiguous and should be only acceptable in Context B (62b).

We illustrate the structural ambiguity in (63). In Context A, (61a), 'at five' modifies the time argument of *kuri*, which is subsequently bound by *pro*; given that 'at five' may not modify the speech time, the evaluation time needs to be shifted. The relevant LF and interpretation are in (63a). In Context B in (61b), 'at five' modifies the time of the covert viewpoint aspect, which *kuri* then existentially quantifies (and it 'becomes' the *kuri time span*). Given the meaning of the covert viewpoint aspect, this time interval contains the event time, so we arrive at the interpretation that the leaving event happened at 5 o'clock. The LF and interpretation are shown in (63b). Here the evaluation time can be either default or backshifted.

(63) a. [*pro* ... [at 5 [*kuri* [$\text{ASP}_{\varnothing}$ [Kalo leave the house]]]]]
$[\![\text{(63a)}]\!]^{s,n} = 1$ iff
$\exists t' \exists e [\text{leave-the-house}(e)(kalo) \wedge t' < t_n \wedge \tau(e) \text{ AT } t' \wedge t_n \subseteq 5\ o'clock]]$

[38] Our primary consultant, with whose help we prepared this questionnaire, found each sentence ambiguous, and appropriate in both contexts.

b. [*pro* ... [*kuri* [at 5 [ASP$_\varnothing$ [Kalo leave the house]]]]]
$[\![(63b)]\!]^{s,n} = 1$ iff
$\exists t' \exists e\,[\text{leave-the-house}(e)(kalo) \wedge t' < t_{s/n} \wedge \tau(e)\ \text{AT}\ t' \wedge$
$t' \subseteq 5\,o'clock]]$

In this first questionnaire we only confirmed that a sentence with *kuri* is ambiguous with respect to adverbial modification, but we didn't test whether the corresponding sentence without *kuri* is not. We did so in the second questionnaire, which was presented in written form, and was completed by 10 (bilingual) speakers of Paraguayan Guarani. Here a sentence in Paraguayan Guarani was presented first, accompanied by two contexts in Spanish, and participants were asked whether the sentence is appropriate in the given contexts. Participants could select one of the presented contexts, both or none.

Two such items – a sentence with two contexts – were presented. The first item is in (64). The selection responses, shown for each context, confirm the ambiguity of the sentence. In Context A in (64a), 'at five' modifies the time argument of the covert viewpoint aspect, ultimately constraining the event time. In Context B in (64b) 'at five' modifies the time argument of *kuri*. The two LFs and their interpretations are shown in (65) (they are identical in all relevant respects to (63)). Note that the interpretation in (64b)/(65b) is harder to get, as is the case for the English (60b), but here the difficulty is exacerbated by the fact that the reading also requires evaluation time shift. For (64a)/(65a) the evaluation time can be the default speech time.[39]

(64) Cinco aravo, Luis o-sẽ *kuri* oficina-gui.
Five Luis 3-leave KURI office-from
'At five o'clock Luis left the office.' /
'At five o'clock Luis was gone from the office.'

a. *Context A: José arrived at the office at five.*
Luis was leaving just at that time. *selected by 7/10*

b. *Context B: When José arrived at the office at five, Luis was not there.*
That day he had left the office early. *selected by 3/10*

(65) a. [*pro* ... [*kuri* [at 5 [ASP$_\varnothing$ [Luis leave office]]]]]
$[\![(65a)]\!]^{s,n} = 1$ iff
$\exists t' \exists e\,[\text{leave-the-office}(e)(luis) \wedge t' < t_{s/n} \wedge \tau(e)\ \text{AT}\ t' \wedge t' \subseteq 5\,o'clock]]$

b. [*pro* ... [at 5 [*kuri* [ASP$_\varnothing$ [Luis leave office]]]]]
$[\![(65b)]\!]^{s,n} = 1$ iff
$\exists t' \exists e\,[\text{leave-the-office}(e)(luis) \wedge t' < t_n \wedge \tau(e)\ \text{AT}\ t' \wedge t_n \subseteq 5\,o'clock]]$

The second item is illustrated in (66). Given the absence of *kuri*, (66) is not ambiguous, as there is only one time interval that the adverbial can modify; see the LF and interpretation in (67) (here too evaluation time shift is needed). Accordingly, for this item in the questionnaire, only one of the 10 Paraguayan Guarani speakers selected the context in (66b) as appropriate, and the same speaker also indicated a

[39] It is also possible that because its context was presented second, this interpretation was less likely to be accessed, with participants already committing to the interpretation that corresponds to the initially-presented context.

preference for the context in (66a). (One additional participant marked that neither context is appropriate.)

(66) Cinco aravo, Juana o-sẽ hóga-gui.
Five Juana 3-leave house-from
'At five o'clock Juana left the house.'

a. *Context A: When Luis arrived at the house at five in the afternoon, Juana was leaving just then to go pick up the children from school.* *selected by 9/10*

b. *Context B: When Luis arrived at the house at five in the afternoon, Juana was not there. Juana had gone to pick up the children from school.* *selected by 1/10*

(67) [*pro* ... [at [$\text{ASP}_{\varnothing}$ [Juana leave house]]]]
$[\![(67)]\!]^{s,n} = 1$ iff
$\exists e\,[\text{leave-the-house}(e)(\mathit{juana}) \wedge \tau(e)\,\text{AT}\,t_n \wedge t_n \subseteq 5\,o'clock]]$

If *kuri* were a past tense or a past adverb, there would be no ambiguity contrast between (64) and (66). Analyzing *kuri* as a retrospective aspect predicts that (64) is ambiguous whereas (66) is not.

The same 10 speakers of Paraguayan Guarani also completed another version of the selection task seen in (64) and (66) in the same questionnaire. In this version, the context was presented first, in Spanish, followed by two sentences in Paraguayan Guarani, which were identical except for the presence or absence of *kuri*, see (69a) and (69b). Two such items were presented: the context in (68a) and the sentences in (69a) and (69b), and then the context in and (68b), again followed by the same sentences. Participants could select one, both or none of the sentences as appropriate for each context.

(68) a. *Context A: Kalo left his house before five (that is, at five he was no longer home)*

b. *Context B: Kalo left his house at five (that is, he was at home until five)*

(69) a. Kalo o-sẽ *kuri* hóga-gui la cinco.
Kalo 3-leave KURI house-from the five
selected by 5/10 in Context A & 3/10 in Context B

b. Kalo o-sẽ hóga-gui la cinco.
Kalo 3-leave house-from the five
selected by 1/10 in Context A & 9/10 in Context B

In Context A, (68a), the adverbial should modify a past time that follows the event time. Only the sentence with *kuri* can have this interpretation. Half of the participants selected the sentence with *kuri*, (69a). (4 participants indicated that neither sentence is appropriate.) Context B, (68b), determines that the temporal adverbial should modify the aspect time, and thus ultimately the event time. Here either of the sentences can have the needed interpretation. Indeed, while the majority of the speakers selected the sentence with the bare verb, (69b), several participants selected the sentence with

kuri, (69a) (2 participants selected both sentences). These results are in line with the facts in (64)/(66) and in (61)/(62), and they indicate that *kuri* allows an additional opportunity for adverbial modification, something that only a retrospective marker could do. A past tense or a past adverb would not have this temporal effect.

In summary, we tested whether *kuri* can lead to ambiguities of temporal modification with two groups of Paraguayan Guarani speakers and with items, which were either presented orally or in written form, and which involved a selection between two contexts for a given sentence or between two sentences for a given context. We summarize the results in Table 3.

The upper left cell of participants' responses is key for our argument. It represents the interpretation that is only expected if *kuri* is a retrospective aspect, and not a past adverbial or a past tense. Clearly this interpretation is available to Paraguayan Guarani speakers.[40] We thus find support for our proposal that *kuri* is a retrospective aspect. This removes a potential counterexample to our claim that Paraguayan Guarani does not have tense. It also will be relevant for two of our empirical arguments against covert tense in the language: future-in-the past interpretations and simultaneous reference to past and present sub-events.

	event time is before 5	event time is at 5
... o-sẽ *kuri* ... 'at 5' (62a), (62b), (64), (69a)	7/8, 6/8, 3/10, 5/10	8/8, 8/8, 7/10, 3/10
... o-sẽ ... 'at 5' (66), (69b)	1/10, 1/10	9/10, 9/10

Table 3 Selection responses to adverbial modification with and without *kuri* in context

4.4 Summary: aspect in Paraguayan Guarani

Paraguayan Guarani has viewpoint aspects, both overt and covert, as well as high aspects. A potential contender for an optional past tense such as *kuri* as shown to be a retrospective high aspect. This supports our argument that Paraguayan Guarani does not have tense. It also supports pursuing a fairly conservative approach in our formal account of temporality: given that Paraguayan Guarani has aspects of a familiar kind, its analysis needs to be minimally different from the types of formal analyses that have successfully captured the meaning of aspectual markers in various other languages. A radically different approach, e.g., not positing quantification over times or relying exclusively on pragmatic principles, would fail to reflect the fact that apart from not having overt tense morphemes, Paraguayan Guarani looks remarkably similar to languages for which the neo-Reichenbachian framework has proven fruitful.

[40] The 1/10 responses in the lower left cell are not expected on any account. They were contributed by two different participants and are possibly just errors.

5 Complement clauses to attitude verbs

5.1 A note on the subordinator *-ha*

Verbs in declarative attitude complements are marked with the subordinating affix *-ha*. Tonhauser (2006, 2011b) analyzes *-ha* as a nominalizing clause marker, but we do not adopt this analysis, for two reasons. Apart from the presence of *-ha*, there are no differences of inflection between matrix and embedded clauses and no differences in the realization of arguments. In contrast, cross-linguistically, nominalized complement clauses show distinct syntactic properties in terms of case and agreement in comparison to CP complements (see Pires & Milsark 2017 for a review). Furthermore, in Pancheva & Zubizarreta we point out that evidentials may appear in embedded clauses in the presence of *-ha*, which suggests that such clauses are not nominalized. In Turkish, where complement clauses to attitude verbs can be either finite, with a nominative or accusative subject, or nominalized, with a genitive subject, embedded evidentials are only possible in the former type of clause (Korotkova 2016). Similarly, Faller (2002) attributes the impossibility of embedded evidentials in Cuzco Quechua to the fact that embedded clauses in that language are nominalized. Since *-ha* is affixed to the predicate, it appears low in the clausal structure, with other expressions possibly following it, while still being contained in the embedded clause; see Zubizarreta (2022).

5.2 Simultaneous, backshifted, and double-access interpretation of complement clauses

Stative predicates in embedded clauses in English give rise to two interpretations, relative to the time of the matrix attitude event: a backshifted one, (70a), where the state of Bill being sick holds at a time prior to the time of Ann saying so, and may or may not extend to also include the time of Ann's speech; and a simultaneous one, (70b), where the state of Bill being sick must hold during the time of Ann's saying so.

(70) Ann said that Bill was sick.

a. Ann said: "Bill was sick" *backshifted*
b. Ann said: "Bill is sick" *simultaneous*

Bare stative predicates in attitude complements in Paraguayan Guarani only have a simultaneous reading, i.e., the embedded stative predicate must hold at the time of the matrix attitude event (Tonhauser 2011b: (31d), confirmed by our consultants). The same facts hold in Mbyá Guarani (Thomas 2014: (23)-(24)).

We replicated the intuitions of our consultants with 10 Paraguayan Guarani speakers, who evaluated written sentences with a stative predicate in the attitude complement, relative to contexts requiring backshifting, simultaneous, or double-access interpretation. The sentences are illustrated in (71): they involve a bare predicate, a predicate marked by *kuri*, and a predicate marked by *-gue*, which Tonhauser (2011b)

analyzes as a terminative aspect. The three contexts are illustrated in (72): (72a) requires a backshifted interpretation, (72b) requires a simultaneous interpretation, and (72c) requires for the embedded predicate to hold both at the time of attitude and the time of speech, i.e., a double-access interpretation. For each context, presented in Spanish, and as different items in the questionnaire, participants could select any of the three sentences including none.

(71) a. Kuehe, Kalo o-momb'eu chéve Maria hasy -ha
yesterday Kalo 3-tell me Maria 3.sick SUBORD
'Yesterday Kalo told me that Maria was sick.'

b. Kuehe, Kalo o-momb'eu chéve Maria hasy -ha *kuri*
yesterday Kalo 3-tell me Maria 3.sick SUBORD KURI
'Yesterday Kalo told me that Maria was sick.'

c. Kuehe, Kalo o-momb'eu chéve Maria hasy -ha *-gue*
yesterday Kalo 3-tell me Maria 3.sick SUBORD -TERM
'Yesterday Kalo told me that Maria had been sick.'

(72) *Context:*
a. *Maria was no longer sick yesterday when Kalo told you about her.*
b. *Maria was sick and was still sick yesterday when Kalo told you about her, and she may or may not be still sick.*
c. *Maria was sick yesterday when Kalo told you about her, and she is still sick now.*

The selection responses of the participants are summarized in Table 4. One participant selected both (71a) and (71b) in the simultaneous context (72b), in all other cases participants selected a single response.

	backshifted (72a)	simultaneous (72b)	double access (72c)
... Maria hasy -ha (71a)	0/10	2/10	10/10
... Maria hasy -ha *kuri* (71b)	0/10	7/10	0/10
... Maria hasy -ha-*gue* (71c)	10/10	2/10	0/10

Table 4 Selection responses to attitude complements in context

We next discuss the implications of these results for the question of whether Paraguayan Guarani has tense and for the meaning of *kuri*. We put aside the exact semantics of *-gue*.

5.3 Consequences for tense, or rather, its absence from embedded clauses

None of the participants selected (71a), the sentence with bare *be sick*, in the context in (72a), confirming reports in the literature and the judgements of our consultants that this sentence does not allow a backshifted interpretation. This fact is problematic

for the analysis of Paraguayan Guarani as a language with covert lexical tense. Let's unpack why this is so.

A structural approach to simultaneous and backshifted readings in attitude complements posits that languages that allow simultaneous readings with embedded past tense, like English, do so because the past features are not interpreted (Ogihara 1995, von Stechow 1995, Abusch 1997, Kusumoto 2005, Stowell 2007, a.o.). Below we illustrate one implementation of this approach, using feature deletion and assuming a pronominal semantics for tense. Two readings are available to sentences with an embedded morphological past tense in English because two LFs are possible, one with an interpreted PAST feature and another where the tense feature is deleted see (73). On the structural approach, a deleted embedded past in English gets interpreted the same way as an embedded present in Japanese, and a non-deleted embedded past in English is interpreted just as an embedded past in Japanese is.

(73) Ann said that Bill was sick.

a. [[T_1 PAST] λt_2 Ann say at t_2 [λt_3 [T_3 **PAST**] λt_4 Bill sick at t_4]] *backshifted*

b. [[T_1 PAST] λt_2 Ann say at t_2 [λt_3 [T_3 ~~**PAST**~~] λt_4 Bill sick at t_4]] *simultaneous*

The covert lexical tense posited for Paraguayan Guarani and for languages with a similar temporal profile is NON-FUTURE. A non-future tense in embedded clauses in Paraguayan Guarani would lead to the expectation that backshifted readings should be possible for bare predicates. Two LFs should be available for (71a), as in (74). An interpreted embedded non-future tense, as in (74a), would permit both a backshifted and simultaneous interpretation, and a deleted embedded non-future tense, as in (74b), would result in a simultaneous interpretation. The context in (72a) would then require the interpretation that corresponds to the LF in (74a). Yet this must not be a possible LF for (71a), and the only available LF must be the one in (74b), given that only the simultaneous interpretation is available for this sentence.

(74) a. [[T_6 NON-FUT] λt_2 Kalo say at t_2 [λ_5 [$\mathbf{T_5}$ **NON-FUT**] λt_4 Maria sick at t_4]]

b. [[T_6 NON-FUT] λt_2 Kalo say at t_2 [λ_5 [$\mathbf{T_5}$ ~~**NON-FUT**~~] λt_4 Maria sick at t_4]]

In other words, an analysis with covert lexical tense needs to posit an obligatory deletion of the tense features in embedded clauses. This does not appear to happen in languages with overt tense: no languages have been reported where a past tense in an embedded clause only leads to a simultaneous interpretation, on account of having been obligatorily deleted. Thus it would be difficult to argue that such an obligatory deletion obtains in a language without overt tense. Accordingly, Thomas (2014) posits that tense must be altogether absent from Mbyá Guarani embedded clauses. In the absence of embedded tense, sentences with attitude complements would have a single LF of the kind that only yields a simultaneous interpretation, as in (75).

(75) [[T_6 NON-FUT] λt_2 Kalo say at t_2 [λt_4 Maria sick at t_4]] *simultaneous*

Similar considerations apply if tense is not lexical, although no deletion rule would be involved, since the LF doesn't contain tense to begin with. According to the analysis in Tonhauser (2011b), the semantic rule that provides tense post-LF is only operative in matrix clauses and does not apply in embedded ones.

We thus have an empirical argument in favor of a tenseless analysis of attitude complements in Paraguayan Guarani. Clearly, an analysis that goes further and posits no tense at all, whether in matrix or embedded clauses, has a conceptual advantage.

5.4 Cross-linguistic differences in the interpretation of bare predicates

A comparison with Washo provides empirical support for the tenseless analysis. Recall that similarly to Paraguayan Guarani, Washo does not generally allow future reference for bare predicates, requiring a prospective aspectual marker. Bochnak (2016) suggests that Washo has a covert tense, T_i, whose restriction to non-future times is not lexical but is at the level of discourse. As it turns out, there is an important difference between Washo and Paraguayan Guarani: Washo allows backshifted interpretation for bare predicates in attitude complements after all, as pointed out in Bochnak et al. (2019). Consider the example in (76) (Bochnak et al. 2019: (27c), (28d)). Its complement clause has no overt tense marker, and neither does the matrix clause. In that respect it is just like the Paraguayan Guarani example (71a). But unlike (71a) in Paraguayan Guarani, (76) has both a backshifted and a simultaneous interpretation, as it is appropriate in both contexts in (76a) and (76b).

(76) Tim de-gum-díʔye? M-é-aʔ di-hámu-yi
Tim NMLZ-refl-name 2-be-DEP 1-think-IND
'I thought your name was Tim.'

a. *Context: You see a man in the street and say "Hi Tim!" He tells you his name isn't Tim. You apologize and say:* *simultaneous*

b. *Context: You run into your old friend. His name used to be Tim, but you heard that he changed his name since you last saw him* *backshifted*

According to Bochnak et al. (2019), in the backshifted reading the tense pronoun is interpreted *de re*, rather than as a bound pronoun. It undergoes *res*-movement outside the scope of the attitude verb, which has a different lexical meaning, with an extra *res*-argument, compared to the variant of the attitude verb where no such *res*-movement happens. The two LFs are sketched in (77). The LF that results in a backshifted reading, (77b), can be suitably paraphrased as 'I thought of the past time t_3 that your name was Tim at t_3.

(77) a. [$\mathbf{T_8}$ λt I think at t [λ_3 $\mathbf{T_3}$ $\lambda t'$ your name is Tim at t']] *simultaneous*
b. [$\mathbf{T_8}$ λt I think$^{de\ re}$ $\mathbf{T_3}$ at t [λ_2 $\lambda t'$ your name is Tim at t']] *backshifted*

If Paraguayan Guarani has no lexical tense at all, the contrast with Washo would follow. In the absence of a tense pronoun to undergo *res*-movement and be interpreted *de*

re, the backshifted reading cannot obtain. We thus have an empirical argument against positing even a pared-down version of tense, without lexical non-future features.[41]

5.5 Consequences for the analysis of *kuri*

The sentence with *kuri*, (71b), was selected only in the simultaneous context, and in fact was preferred in that context to the sentence with a bare predicate, (71a). The weak retrospective semantics of *kuri* allows for an *extended now* reading, §4.3.1, predicting that a simultaneous interpretation should be possible. What may at first seem surprising is the preference for *kuri* over a bare predicate. Note though that the context specified that Maria was sick both prior to the matrix attitude event and during it. A predicate with *kuri*, contributing an *extended now*, is well suited for expressing this meaning. In fact, on our tenseless account, it is better suited than a bare predicate, see (78).[42] The same holds for the English pair of sentences in (79): both allow a simultaneous interpretation, but (79b) in addition highlights the extended duration of the state.

(78) a. $[\, pro\ \lambda t_1$ Kalo say at $t_1\ [\, \lambda_2\ pro_2\ \ \lambda t_3$ Maria sick at $t_3\,]]$
tenseless LF, (71a)
b. $[\, pro\ \lambda t_1$ Kalo say at $t_1\ [\, \lambda_2\ pro_2\ \ \lambda t_3\ \exists t_4\ [\, t_4 \leq t_3 \wedge$ Maria sick at $t_4\,]]$
tenseless LF, (71b)

(79) a. Ann said that Bill was sick
b. Ann said that Bill had been sick.

Furthermore, if *kuri* were a past tense, its preference over the bare predicate for expressing the simultaneous reading would also remain unexplained. On the structural approach to sequence of tense, the past tense would be used optionally, only for its past feature to be then deleted, resulting in the same meaning as the one contributed by the bare predicate, whether it is because the bare predicate is tenseless or because its non-future tense features would also be deleted. Analyzing *kuri* as a high aspect with weak retrospective semantics rather than as a past tense, better represents the participants' choices.

The lexical semantics of *kuri* we proposed predicts that a backshifted reading should be available: the *kuri* time span may precede the evaluation time for the embedded clause. Yet none of the Paraguayan Guarani speakers selected (71b) in the context in (72a). This must be because this context not only requires that the state obtain before the attitude event, but also that it terminate. *Kuri* doesn't force termination, which makes terminative aspect *-gue* more appropriate in that context.

[41] We note, however, that Bochnak et al. (2019) observe that in Medumba the backshifted reading of bare complement clauses is not as freely available, as it is in Washo, and that the same is true for bare imperfective complement clauses in Samoan. Their conclusion is that *res*-movement is itself subject to parametric variation across languages. On this account, the absence of backshifted interpretations in Paraguayan Guarani could be due to restrictions on *res*-movement. We do not find this alternative convincing, particularly in the absence of a theory of what factors govern the possibility of *res*-movement cross-linguistically.

[42] The LFs in (78) includes a λ-bound *pro* in the complement clause, which is ultimately interpreted as the time of the matrix attitude (cf. (12)).

5.6 No obligatory double-access readings

Finally, the results in the double-access context in (72c) might initially suggest that bare predicates must both hold at the time of the attitude and at the time of speech, but this is not the case. We see that at least some participants selected the bare form in the simultaneous context in (72b), where the double-access interpretation does not obtain, so it is unlikely that the embedded bare form must hold at the speech time.

We directly tested this question with our consultants. The acceptability of (80a), particularly as followed up by (80b), confirms that an embedded bare predicate does not have to hold at the speech time.

(80) a. O-japo peteĩ ary, Maria he'i (kuri) hyeguasu -ha
3-make one year, Maria 3.say (RETROSP) 3.pregnant SUBORD
'A year ago Maria told us that she was pregnant.'

b. O-japo 10 meses, Maria he'i hyeguasy -ha -gue kuri
3-make ten months, Maria 3.say 3.pregnant SUBORD TERM RETROSP
(ãnga katu ho'a chugui i-memby)
but 3-fall from.3 3POS-child
'Ten months ago, she said that she had been pregnant (but she lost her baby).'

The necessary double-access interpretation of an embedded present tense in English is attributed to its lexical semantics: unlike the past tense, it encodes reference to the speech time, (cf. Sharvit 2020, Kusumoto 2005, a.o.). If Paraguayan Guarani has no lexical tense, as we suggest, it should not be possible to enforce a double-access reading, and indeed such a reading is not obligatory in the language.

5.7 Summary: temporal interpretation of attitude complements

Bare predicates in complements to attitude verbs do not have a backshifted or a double-access reading, but only a simultaneous reading. This is expected if the language has no tense in embedded clauses. For the sake of uniformity, no tense should be posited in matrix clauses either. This is the first empirical argument in favor of the no-tense account.

The interpretation of *kuri* in attitude complements provides an additional argument against its analysis as an optional past tense, or a past adverbial, and in favor of an analysis as a weak retrospective marker. The fact that *kuri* is not an optional past tense strengthens the proposal that Paraguayan Guarani has no tense.

6 Constraints on evaluation time shift in English and Paraguayan Guarani

Independently established constraints on evaluation time shift in English can be shown to operate in Paraguayan Guarani. This serves to support our proposal that temporal reference in that language is established not through tense but through manipulation of the evaluation time parameter, default or shifted.

6.1 Restriction of evaluation time shift to narratives in English

In English, evaluation time shift is only possible in narratives.[43] This generalization, although perhaps widely assumed, given the name *narrative present*, has not been explicitly addressed in the linguistic literature, as far as we know.

A narrative tells a story, a series of related events. We abstract away from the concerns of plot, character development, etc, that preoccupy literary analyses of narratives (with extension to non-linguistic art forms such as film or comics), to focus on the core structure that underlies narratives in language: a sequence of clauses. We adopt the following working definition of a narrative, which meets our purposes in this paper.[44]

(81) *Narrative (working definition):*
A sequence of independent (main) clauses, or clauses modified by temporal adjunct clauses,
σ_1 ... σ_n, in utterances with the same speaker, linked by a coherence relation.

The requirement for the clauses to have the same speaker distinguishes between narratives and question-answer pairs, and ensures consistent perspective across clauses: initial evaluation time shift in σ_1 and its subsequent update in σ_2 ... σ_n are linked to the same speech context. The requirement for coherence ensures that the events described in σ_1 ... σ_n are related. Finally, narratives may contain any type of clause, including attitude complements, but a minimal narrative may not consist of a main and an embedded clause.

Consider the contrast between the individual clauses of the question-answer pairs in (82) and the narrative sequences in (83). In (82), the narrative present is not possible; the past tense is needed to describe a past eventuality, and prospective *woll* is needed, together with present tense, to describe a future eventuality. In (83), the narrative present is used felicitously for both past and future reference.

(82) a. Q: What {#do / did} you do yesterday?
A: We { #go / went} to the market.

b. Q: What {#do / will} you do tomorrow?
A: We #(*will*) go to the market.

(83) a. Just hear what happened! Yesterday we go to the market, we have lunch, and then ...

[43] We put aside non-canonical questions, e.g., *When is the siege of Leningrad?* asked by a history teacher. This is not an information seeking question and is only felicitously asked with a historical lesson, a narrative, in the common ground. A harder case to explain is *And the Maryland delegation goes two to one for the Democrats!*, which could be said by an on-the-scene newscaster, as noted in Parsons (1990): 30; this is similar to the *play-by-play* use of the narrative present, yet the latter obeys the narrative restriction.

[44] The units of a narrative may not always be clauses (e.g., see (i), where the time adverb may plausibly be argued to be a separate unit) but this is a good enough approximation.

(i) 1792. For two months, then three months, the National Assembly of France *has* been in a state of indecision: should it back war against the coalition of emperors and kings, or should it argue for peace? (Stefan Zweig "The Genius of a Night: the Marseillaise")

b. Just imagine our weekend! Tomorrow we go to the market, we have lunch, and then ....

We do not have an explanation for why evaluation time shift is restricted to narratives, but at least we can show that the restriction is partly met in Paraguayan Guarani. As we discuss in more detail in §6.3.1, evaluation time shift to the future of the speech time is restricted to narratives, just like in English. Only in reference to the past is evaluation time shift free of the narrative restriction.

6.2 Temporal constraints on evaluation time shift in English

We next examine whether there are further constraints on evaluation time shift, besides its restriction to narratives in English. The expectation is that any constraints in English would be the same in Paraguayan Guarani, controlling for type of clause, free-standing or in a narrative sequence, given that the mechanism of evaluation time shift is independent of the presence or absence of tense.

6.2.1 Initial evaluation time shift

Evaluation time shift is a phenomenon of perspectival shift. The speaker's *now* is dissociated from the actual speech time, allowing the time when the events happen to be presented, for the purposes of a more vivid story, as if it were the speech time. The simplest perspective is one where not only the shifted speaker's *now* overlaps with the reference time of tense but also where the reference time overlaps with the time of the described event as well, as is the case for the simple present tense in the narrative mode. A prospective or a retrospective relation between the reference time and the time of the described event, as in present tense plus *woll* or the present perfect, would ultimately dissociate the speaker's *now* from the time of the event, creating a more complex perspective. It is natural to suppose that with initial evaluation time shift, the simplest perspective needs to be adopted.

Yet we have empirical evidence that the present perfect may appear in clauses that begin a segment in the narrative mode. The first clause in (84) partially repeats an example seen earlier in (5). It follows a stretch of narrative in the canonical present tense, evaluated from the perspective of the speech event (the publication date in January 2021), so it is initial in its own stretch of narrative in the narrative mode. We can also modify the example seen in footnote 44 to make the clause with the present perfect discourse initial, with acceptable results, see (85).

(84) In July 2021, I *have* gone back to worrying about things both meaningful and mundane. I'*ve* set countdown clocks not to politics but to the birth of a new grandchild, [...]

(85) In 1792, for two months, then three months, the National Assembly of France *has* been in a state of indecision ...

The same is not true for prospective markers. Example (86a), from Schlenker 2004, was discussed earlier; here in (86b) we add prospective *be going to* and *woll*, and the result is degraded.

(86) Fifty eight years ago to this day, on January 22, 1944,
   a. the Americans *are* about to invade Europe ...
   b. #the Americans *are going to* / *will* invade Europe ...

To be sure, prospective markers are found in the narrative mode, just not, apparently, in clauses where evaluation time shift applies for the first time.

(87) It is a bright summer day in 1947. My father, a fat, funny man with beautiful eyes and a subversive wit, is trying to decide which of his eight children he will take with him to the county fair. My mother, of course, *will* not go. [...]" (Alice Walker "Beauty: When the Other Dancer Is the Self."

(88) They begin to cross the isthmus in the province of Coyba, the little realm of the chief Careta whose daughter is Balboa's companion; it *will* later turn out that Núñez de Balboa has not chosen the narrowest place [...] (Stefan Zweig "Flight into immortality: the discovery of the Pacific Ocean")

We thus posit the constraint in (89), a modified version of Anand & Toosarvandani (2018a): (24).[45] It allows the present perfect in discourse-initial clauses in the narrative mode, but prohibits prospective markers, i.e., it precludes future-in-the-past in clauses that begin a narrative in the narrative mode.

(89) *Constraint on initial evaluation time shift in narratives* σ_1 σ_2:
Initial evaluation time shift in σ_1 may not precede the time of the event in σ_1.

6.2.2 Updates to the evaluation time

The order of events in narratives reveals that updates to the evaluation time from one narrative clause to the next are subject to temporal constraints, in both Paraguayan Guarani and English. Both languages prohibit temporal reordering of events in the absence of morphemes that independently dissociate the event time from the evaluation time (e.g., past tense, perfect aspect, prospective *woll*). This suggests that evaluation time shift alone cannot result in temporal reordering of events. This generalization provides a metric for our proposal that temporal reference in Paraguayan Guarani does not involve tense.

Narrative sequences, σ_1 σ_2 in the minimal case, may be associated with different temporal orders for the events in the two clauses. When the order of events corresponds to the order of the clauses in the narrative, $\tau(e_1) < \tau(e_2)$, we have temporal progression, and when there is temporal re-ordering of the events, $\tau(e_1) > \tau(e_2)$, we can speak of temporal regression, or backtracking. A lot of attention has been paid

[45] Anand & Toosarvandani (2018a) propose that evaluation time shift in σ_1 needs to be anchored at the described event in σ_1. This will not give the correct result for the examples in (84), (85). A possible amendment to their constraint could allow anchoring in a result state, contributed by the perfect.

to issues of temporal orders in canonical narratives, with particular focus on the role of aktionsart and coherence relations (e.g., Lascarides & Asher 1993, Kehler 2002, Altshuler 2016). What is particularly relevant for our goals is a discovery by Anand & Toosarvandani (2018a) that the narrative present, unlike the past tense, does not allow temporal regression. Consider the minimal narratives σ_1 σ_2 in (90) and (91). In (90), a narrative in the canonical mode, the event described in the first clause σ_1 may temporally follow the event described in the second clause σ_2. In (91), a narrative in the narrative mode, this is not so: the event of σ_1 may not follow the event in σ_2.

(90) Max fell. John pushed him. $\tau(e_1) > \tau(e_2)$ or $\tau(e_1) < \tau(e_2)$

(91) Max falls. John pushes him. $\tau(e_1) < \tau(e_2)$

We make the additional observation that the same facts obtain in narratives about the future. Backtracking is allowed in English narratives with the canonical present tense and prospective *woll*. Both event orders are possible in (92). But if concerned with future reference, the narrative in the narrative mode, (91), does not allow backtracking either.

(92) Max will fall. John will push him. $\tau(e_1) > \tau(e_2)$ or $\tau(e_1) < \tau(e_2)$

Thus the paradigm for English is as in (93). There is a correspondence between the necessity for evaluation time shift – the narrative present must involve evaluation time shift, whereas the canonical tense-aspect forms may or may not – and the possibility of backtracking.[46]

(93) *Temporal order of events in narratives* σ_1 σ_2*:*

a. Narratives in the canonical mode (past tense, present tense with *woll*) allow backtracking

b. Narratives in the narrative mode (narrative present) prohibit backtracking.

The descriptive generalization in (93) is captured by the constraint in (94), which is an amended version of the update constraint from Anand & Toosarvandani (2018a): (21).[47]

(94) *Constraint on evaluation time update in narratives* σ_1 σ_2:

a. The evaluation time in σ_2 may be the speech time.

[46] Tense-aspect forms other than the narrative present are compatible with evaluation time shift. Recall that in footnote 15 we saw an example of Italian past tenses likely involving evaluation time shift, as well as a present tense and *woll* that definitely involve a shifted evaluation time. Thus, it is possible that backtracking in (90) is derived via evaluation time shift, as suggested in Anand & Toosarvandani (2018a). However, an alternative is available. Let's assume that the event in σ_1, Max falling, is at t_1. Then in σ_2, the past tense, evaluated with respect to *the speech time*, i.e., without evaluation time shift, may place the reference time before t_1, and thus allow backtracking.

[47] The difference lies in (94b). Anand & Toosarvandani (2018a) propose that a shifted evaluation time in σ_2 must be anchored to the beginning of the event in σ_1. This however requires the evaluation time to extend past the time of the event in the first clause, to allow for narrative progression. In the Appendix we suggest that a shifted evaluation time does not extend in duration.

b. The shifted evaluation time in σ_2 may not precede the time of the event in σ_1

The condition in (94b) is responsible for the impossibility for backtracking in the narrative mode. Since the evaluation time for σ_2 in (91) may not precede the time of Max's falling, and the present tense locates the reference time at the evaluation time, the time of John's pushing Max may also not precede the time of Max's falling. The lack of temporal regression is derived. Temporal progression is achieved through shifting the evaluation time for σ_2 after the time of the event in σ_1, something that (94b) allows.

The condition in (94b) also correctly accounts for mixed-mode narratives, where the canonical tense-aspect forms (past tense / present tense and *woll*) and the narrative present are both used. The examples we saw earlier in (4) and (5) were both of this type. We illustrate with (95)-(96), where σ_1 has a default evaluation time and canonical tense / aspect, while σ_2 is in the narrative present, and we note that such mixed-mode narratives do not allow backtracking. Here too, in accordance with (94b), the evaluation time of σ_2 may not precede the event of Max falling, preventing backtracking.

(95) Max fell. (All of a sudden,) John pushes him. ... $\tau(e_1) < \tau(e_2)$

(96) Max will fall. (All of a sudden,) John pushes him. ... $\tau(e_1) < \tau(e_2)$

We do not think of the temporal constraints as inviolable; rather they are defaults that may possibly be overridden by overt adverbial modification, or by pragmatic reasoning. Nevertheless, they help advance our understanding of temporality in Paraguayan Guarani, and in particular, offer us two empirical arguments that evaluation time shift rather than tense is responsible for temporal reference in the language.

6.3 Constraints on evaluation time shift in Paraguayan Guarani

6.3.1 Future reference without -ta in Paraguayan Guarani

In §6.1 we pointed out that evaluation time shift in English is restricted to narratives. In Paraguayan Guarani, forward evaluation time shift must be similarly restricted, given that prospective *-ta* is required in single-standing sentences, e.g., (36c), (37c), (40), just as *woll* is in English, (82b). We expect that forward evaluation time shift should be possible in narratives, again like in English, where *woll* can be absent, (83b). Thus narratives should allow for the omission of *-ta*. This is indeed the case, as seen earlier in (52a). Here we illustrate with two more examples, (97) and (98). These sentences were presented in an orally-administered questionnaire, where for each context, participants had three choices, all a sequence of clauses (with *-ta* in the first conjunct, in the last conjunct or with no *-ta*) and could select any individual sequence, all sequences, or none. Here we show only the responses to the sequences where none of the conjoined clauses had the prospective marker *-ta*.

(97) *Context: Mba'épa ja-japo-ta ko'ẽrõ?*
what 1IN-do-PROSP tomorrow
'What will we do tomorrow?'
Ko'ẽrõ ja-páy la 8, ña-rambosa, ha upéi ja-há mercádo-pe.
tomorrow 1IN-wake the 8 1IN-eat.breakfast and then 1IN-go market-LOC
'Tomorrow, we wake up at 8, we eat breakfast, and then we go to the market.'
selected by 6/8

(98) *Context: Eñeimagina ko'ẽrõ ja-ha San Pedró-pe*
imagine tomorrow 1IN-go San Pedro-LOC
'Imagine that tomorrow we go to San Pedro.'
Ko'ẽrõ ja-ha terminál-pe, ja-jupi colectivó-pe, ja-jogua chipa
tomorrow 1IN-go bus.station-LOC 1IN-take bus-LOC 1IN-buy chipa
ha ja-ke.
and 1IN-sleep
'Tomorrow, we go to the bus station, buy chipa (a type of bread) and go to sleep.' *selected by 6/8*

We do not have to say anything special about evaluation time shift in Paraguayan Guarani, as far as reference to the future is concerned: the facts are the same as in English. Where Paraguayan Guarani differs from English is with respect to backward evaluation time shift: it must apply freely, given the acceptability of the free-standing clauses with past reference. e.g., (39). The descriptive generalization is as follows:

(99) Evaluation time shift is:
a. restricted to narratives in English, in the case of both past and future reference
b. restricted to narratives in Paraguayan Guarani, in the case of future reference
c. unrestricted, found in both narratives and free-standing clauses in Paraguayan Guarani, in the case of past reference

Although we find support for the narrative generalization in (99) – *-ta* can be omitted in narratives – we also note that the use of *-ta* is nevertheless preferred, even in narratives. This is to be expected, as in English too the narrative mode, without *woll*, exists alongside the canonical mode with *woll*, and the former is stylistically marked. In a subsequent written questionnaire we asked 10 speakers of Paraguayan Guarani to select those sequences of sentences in (100) that are appropriate in the given context (including all or none). The sequences differ in the distribution of *-ta*: no *-ta* in any clause, (100a), *-ta* only in the first sentence, (100b), or *-ta* in both the first sentence and the first conjunct of the second sentence, (100c). All but one of the participants selected (100c); for 8 of these participants this sentence was their only choice, while one participants selected it together with (100a) and (100b). One other participant selected only (100b).

(100) *Context: María is describing what Juan will do tomorrow*

a. Ko'ẽrõ Juan o-ho San Pedro-pe.
tomorrow Juan 3SG-go San Pedro-to
'Tomorrow Juan goes to San Pedro.'
O-pu'ã voi, o-rambosa, ha upéi o-jupi
3SG-wake.up early 3SG-eat.breakfast and then 3SG-take
colectivo-pe.
bus-on
'He wakes up early, eats breakfast and then takes the bus.'
selected by: 1/10

b. Ko'ẽrõ Juan o-hó-*ta* San Pedro-pe.
tomorrow Juan 3SG-go-PROSP San Pedro-to
'Tomorrow Juan will go to San Pedro.'
O-pu'ã voi, o-rambosa, ha upéi o-jupi
3SG-wake.up early 3SG-eat.breakfast and then 3SG-take
colectivo-pe.
bus-on
'He wakes up early, eats breakfast and then takes the bus.'
selected by: 2/10

c. Ko'ẽrõ Juan o-hó-*ta* San Pedro-pe.
tomorrow Juan 3SG-go-PROSP San Pedro-to
'Tomorrow Juan will go to San Pedro.'
O-pu'ã-*ta* voi, o-rambosa, ha upéi o-jupi
3SG-wake.up-PROSP early 3SG-eat.breakfast and then 3SG-take
colectivo-pe.
bus-on
'He will wake up early, eat breakfast and then take the bus.'
selected by: 9/10

Clearly, the omission of *-ta* in non-initial conjuncts of inter-sentential coordinations, as in the second sentence in (100c), is very natural. This possibility was pointed out in Tonhauser (2011b): (29a). Note that these coordinations cannot be analyzed as being at the level of vPs, with a shared Infl node (of the kind found in the English translation), since each of the three verbs has person/number inflection. It is still possible that the three conjuncts share the *-ta* marker – we do not have evidence whether the person/number inflection or aspectual *-ta* is higher in a clause. If *-ta* is shared, then of course (100c) is not a case of *-ta* being omitted from a clausal conjunct. But (100a) and (100b) are such cases – clauses with future reference without *-ta* – and they were found by some of the participants to be acceptable. As their English translations indicate, (100a) and (100b) are the counterpart of the narrative mode in English, where the present tense is used for narration involving future events, in the absence of prospective *woll*. In (100a), the whole narrative is in the narrative mode; in (100b) we see a switch from a canonical mode in the first sentence, where *-ta* / *woll* is used, to the narrative mode in the second sentence with *-ta* / *woll* omitted. The English future narrative in (5) earlier also exhibited such a switch.

Neither the lexical tense accounts nor the tense-via-a-rule account expect the possibility of omitting *-ta* in coordinations. If non-future tense is obligatory in main clauses, it should appear in all conjuncts of a coordination, and thus for future reference *-ta* should be required in all conjuncts. Tonhauser (2011b): (58) partially addresses problem, in proposing a Rule for Coordinations, as in (101) (slightly modified from the original) just to deal with examples like (100c). This special rule overrides the general prohibition against future reference times, (26).

(101) *Rule for Coordinations*: In conjoined sentences S_1 to S_n if the eventuality time of S_i is temporally located in the future of the utterance time, then the reference time for S_{i+1} is a time shortly after the eventuality time of S_i.

Clearly, positing a special rule to deal with part of the data is conceptually less appealing than a uniform account. In contrast to the tense accounts, which must treat the absence vs. presence of *-ta* through different mechanisms, our account ties future evaluation time shift to narratives and thus predicts the patterns that obtain. The need for *-ta* coincides with the need for default evaluation time: *-ta* is obligatory in free-standing clauses, including question-answer pairs, since these are not part narratives. It is furthermore expected that coordination of clauses will behave as narrative sequences with respect to evaluation time shift. Nothing new needs to be posited for (100c) that is not already needed for (100b) or for (100a), (97) and (98). The only difference among these sentences is whether evaluation time shift applies in the initial clause of the narrative or not: if it does not, *-ta* is needed to derive future reference, if it does, *-ta* is omitted.

There is still one remaining concern. The generalization that forward evaluation time shift is restricted to narratives may be correct, but this shift may still be accompanied by covert tense. In English narratives about the future, both the canonical mode and the narrative mode have present tense, and the former mode also has *woll*. Paraguayan Guarani may be the same, with both a canonical mode and narrative mode, the former requiring *-ta*, the latter not, but with covert non-future tense. If so, the facts discussed in this section would confirm that evaluation time shift is available in Paraguayan Guarani, and would offer conceptual support for our tenseless account but would not additionally also provide empirical support.

This is where the temporal constraints on evaluation time shift become relevant. We justified the constraints on initial evaluation time shift and update for English, and now we propose to extend them to Paraguayan Guarani, on the assumption that discourse constraints of this nature should not be subject to cross-linguistic variation. We further include free-standing clauses, σ_0, which are of relevance to Paraguayan Guarani only; in English the general restriction of evaluation time shift to narratives excludes free-standing clauses from consideration.

(102) *Evaluation time shift ($t_n \neq t_s$) in free-standing clauses σ_0 and narratives σ_1 σ_2*:

a. Initial evaluation time shift in σ (whether σ_0, σ_1, or σ_2 when the evaluation time in σ_1 is t_s) may not precede the time of σ's event: $t_n \not< \tau(e)$.

b. Evaluation time shift in σ_2 may not precede the time of σ_1's event: $t_n \not< \tau(e_1)$.

We make three predictions. First, and this is the crucial prediction, if future narratives involve evaluation time shift, i.e., if they lack *-ta* – and they do not have covert non-future tense – they should prohibit backtracking, for the same reason that the narrative present in (91) does. Given the constraint in (102b), the earliest the evaluation time in σ_2 may be is the time of the event in σ_1. In the absence of non-future tense, there is no way for $\tau(e_2)$ to then precede $\tau(e_1)$: backtracking should be prohibited. But if σ_2 has non-future tense, its reference time can be before the evaluation time, i.e., it can be before $\tau(e_1)$, allowing for $\tau(e_2)$ to precede $\tau(e_1)$: backtracking is allowed. Thus the predictions of the tenseless and the tense accounts diverge.

The second prediction is that future narratives with *-ta* should allow backtracking, just like the English canonical present plus *woll* in (92). This prediction does not differentiate the tenseless and the tense accounts, however. Finally, the third prediction is that narratives about the past should also allow backtracking, even though they all involve evaluation time shift. This is because backward evaluation time shift in Paraguayan Guarani is not restricted and may apply to each clause in a narrative freely as if it were an independent clause. This prediction too does not distinguish between the tenseless and tense accounts.

We find support for these three predictions. We asked native speakers whether sequences of sentences are appropriate in context.[48] In contexts that strongly favor temporal backtracking, none of our consultants accepted (103a) (a future narrative without *-ta*), yet all but one accepted (103b) (a future narrative with *-ta*) and half accepted (104), (a past narrative). This is in line with expectations.[49]

(103) *Context: This morning we went to visit a fortune taller. She told us: 'Now Kalo is fine. However, ...'*

a. ... ko'ẽrõ 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.' *selected by 0/9*

b. ... ko'ẽrõ Kalo o-manó-*ta*. O-hasá-*ta* hi'ári camión.
tomorrow Kalo 3-die-PROSP 3-pass-PROSP on-top truck
'... tomorrow Kalo will die. A truck will run him over.' *selected by 8/9*

(104) *Context: Juan likes to bother his sister Maria at school. The teacher explains why she had to punish him.*

[48] Responses were elicited in written form. For each item (context), there were two or more options. Participants could chose any number of these options. Of the ten participants, one did not respond to the item in (103).

[49] A selection rate of 5/10 for (104) likely reflects a choice between considering the two clauses as free-standing, or as part of a narrative sequence. The addition of indirect evidential *ra'e* to the second clause of a sequence similar to the one in (104), in the same context, resulted in a selection rate of 8/10. The use of *ra'e* indicates that the event in σ_2 has not been directly perceived by the speaker, but has been reported or inferred (Pancheva & Zubizarreta), thus facilitating the interpretation of the two clauses as free-standing rather than forming a narrative.

Kuehe, Maria ho-'a kyhágui. Juan o-myaña chupe.
yesterday Maria 3-fall from-hammock Juan 3-push 3SG.PRON
'Yesterday Maria fell from the hammock. Juan pushed her.'
selected by 5/10

Notably, participants did not find (103a) to be acceptable. The sensible interpretation is that the second clause provides an explanation for the event described in the first clause, requiring backtracking. Yet backtracking must not be possible, in accordance with the predictions of the tenseless account, but against the predictions of the tense accounts. A non-future tense in (103a) would work similarly to the past tense in the English (90) and permit backtracking. The fact that (103b) and (104) are found to be acceptable, suggests that at least some speakers allow temporal regression in narratives when grammatical means allow it.[50]

To sum up, we find support that evaluation time shift in Paraguayan Guarani is the same as in English – restricted to narratives – when the default evaluation time together with a prospective marker, can derive the needed temporal reference (the future). Additionally, future narratives are subject to the same temporal constraints found in English: because evaluation time shift is precluded, as a default, from preceding the time of the event in a prior clause, narrative regression is precluded as well in the default case. The languages diverge only because in the absence of a past tense in Paraguayan Guarani, evaluation time shift is the only grammatical mechanism for past reference, and so the narrative restriction is relaxed. Notably, *kuri* is not a suitable substitute for a past tense as it does not contribute strictly retrospective meanings, allowing the inclusion of the evaluation time as a final subinterval, but also it has other meanings involving focus (and possibly evidentiality).

6.3.2 Future-in-the-past in Paraguayan Guarani

We now present another empirical argument in favor of our tenseless account. If Paraguayan Guarani had non-future tense, it would allow future-in-the-past interpretations in free-standing clauses. Yet it doesn't, and such interpretations are only allowed in non-initial clauses of narratives. These facts directly follow from our proposal that the language has no tense, and past temporal reference is derived with backward evaluation time shift, which is subject to temporal restrictions.

(105) a. # Kuehe Kalo o-purahéi-*ta*.
yesterday Kalo 3-sing-PROSP
'Kalo was going to sing yesterday.'

b. Kuehe Kalo o-purahéi-*ta* *kuri*.
yesterday Kalo 3-sing-PROSP

[50] The prohibition against backshifting obtains for minimal narratives, consisting of two clauses σ_1 σ_2. Longer narratives provide an opportunity for a shift of perspective: instead of the shifted evaluation time being continuously updated from σ_n to σ_{n+1}, a new evaluation time shift obtains in σ_{n+1}, potentially to a time before the time of the event in σ_n. We tested such longer narratives in both Paraguayan Guarani and Spanish, but do not include the results here as they do not affect the main point: minimal narratives with evaluation time shift do not allow for backtracking, which is unexpected on a theory positing null non-future tense.

'Kalo was going to sing yesterday.'

(106) $[\![((105a))]\!]^{g,s}$ is defined iff $t_{rt} \leq t_s$, when defined $[\![((105a))]\!]^{g,s} =$
a. $\exists t \exists e [\text{sing}(e)(kalo) \wedge \tau(e) \text{ AT } t \wedge t > t_{rt} \wedge t \subseteq yesterday]$, or
b. $\exists t \exists e [\text{sing}(e)(kalo) \wedge \tau(e) \text{ AT } t \wedge t > t_{rt} \wedge t_{rt} \subseteq yesterday]$

The absence of a future-in-the-past interpretation in (105a) and its availability in (105b) are predicted by our account. Past reference obtains with backward evaluation time shift, which is still subject to the constraint in (102a) even outside of narratives, it is only exempt from the update constraint in (102b), given the lack of restriction to narratives. Constraint (102a) dictates that the shifted t_n in (105a) must not precede the described event. But in (105a) *-ta* makes that impossible, as it places the event time to the future of t_n. Therefore, the evaluation time in (105a) can only be the default speech time, t_s. And once (105a) is evaluated relative to the speech time, modification by *kuehe* 'yesterday' becomes contradictory, see (107): neither the speech time, t_s, nor the prospective time t' in the future of t_s may be included in the time denoted by the adverbial 'yesterday'.

(107) a. $[\ pro \ldots \lambda t \exists t' \exists e [\text{sing}(e)(kalo) \wedge \tau(e) \text{ AT } t' \wedge t' > t \wedge \{t/t'\} \subseteq yesterday\ ]]$
b. $[\![pro]\!]^{s,n} = t_s$; $[\![(107a)]\!]^{s,n} = 1$ iff $\exists t' \exists e [\text{sing}(e)(kalo) \wedge \tau(e) \text{ AT } t' \wedge t' > t_s \wedge \{t_s/t'\} \subseteq yesterday\ ]]$

As for why *kuri* allows the future-in-the-past interpretation, recall that we analyzed *kuri* as a high aspect marker with a weak retrospective semantics: it introduces a time interval that may include the evaluation time as a final subinterval or may entirely precede the evaluation time (see §4.3). Adding *kuri* does not change the fact that a free-standing clause with *-ta* is subject to the temporal constraint in (102a), so the evaluation time still needs to be the default speech time. But *kuri* brings in a time that can be to the past of the speech time, t' in (108b)-(108c) and the prospective meaning contributed by *-ta* is then calculated relative to that past interval: the interval introduced by *-ta*, t'' is to the future of t'. Both t' and t'' can be in the past of the speech time, and so can be modified by 'yesterday'. The acceptability of (105b) follows.

(108) a. [*pro* ... [*kuri* [*-ta* [Kalo sing] yesterday]]]
b. $[\![kuri]\!]^{s,n} = \lambda p_{\langle i,t \rangle} \lambda t \exists t' [t' \leq t \wedge p(t')]$
c. $[\![pro]\!]^{s,n} = t_s$; $[\![(108a)]\!]^{s,n} = 1$ iff $\exists t' \exists t'' \exists e [\text{sing}(e)(kalo) \wedge t' < t_s \wedge t'' > t' \wedge \tau(e) \text{ AT } t'' \wedge \{t'/t''\} \subseteq yesterday]]$

In contrast, the accounts positing tense cannot explain the facts in (105a) and (105b). As noted in §4.3, Tonhauser (2011b) analyzes *kuri* as a past adverbial 'back then'. By stipulation, the reference time in the presence of *-ta* and in the absence of *kuri* must be present, $t_{rt} = t_s$. The addition of *kuri* is what allows a past reference time, $t_{rt} < t_s$, with *kuri* then modifying the past reference time. Clearly, an explanation is missing. There is no reason why *-ta* should restrict the reference time to present, nor why one past adverbial, *kuri* 'back then', but not another, *kuehe* 'yesterday', should

'restore' the availability of a past reference time, which the non-future semantics of tense allows.

Our account furthermore predicts that a future-in-the-past interpretation would become available with *-ta*, even without *kuri*, in non-initial clauses in narratives. The requirement in (102a) holds only for initial evaluation time shift. Once the evaluation time is shifted in σ_1 in a narrative, its update in σ_2 does not need to be restricted by the time of σ_2's event. The only requirement is (102a): the evaluation time in σ_2 may not precede the time of σ_1's event. The prediction of our account is met, as seen in (109) and (110), which were accepted by all but one of the participants in our orally-administered questionnaire. (The participant who did not accept (109) accepted (110) and vice versa; the two participants found both sentences acceptable with the addition of *kuri*.[51])

(109) Kuehe, a-ha Elsa róga-pe ha nd-a-ikatú-i a-ñe'ẽ
yesterday 1SG-go Elsa house-loc and NEG-1SG-can-NEG 1SG-talk
hendive. O-sẽ-*ta*; o-japurái etereí.
with-her 3SG-go-PROSP 3SG-hurry SUPERLATIVE
'Yesterday, I went to Elsa's house and I was not able to talk with her.
She was about to leave; she was very much in a hurry.' *accepted by 7/8*

(110) A-je-juhú-ramo Marta ndive, o-mendá-ta.
1SG-REFL-meet-WHEN Marta with 3-get.married-PROSP
'When I met Marta, she was going to get married.' *accepted by 7/8*

The tense accounts would have to add (109) and (110) as cases where a past reference time becomes available for a main clause with *-ta*, despite the absence of *kuri*, proliferating the stipulations. On our approach, (109) and (110) are accounted for solely by the constraints on evaluation time shift that also account for (105a) and (105b).

6.4 Summary: evaluation time shift in English and Paraguayan Guarani

We argued that evaluation time shift is restricted to narratives in English, and that Paraguayan Guarani shares this restriction, except for past reference, where evaluation time shift may apply outside of narratives. We demonstrated that evaluation time shift is additionally subject to the constraints in (102) that regulate initial evaluation time shift and its subsequent update. Importantly, we showed that these constraints manifest in identical ways in English and Paraguayan Guarani. The constraint on update, (102b), precludes backtracking in the narrative mode in both languages. The constraint on initial evaluation time shift, (102b), precludes future-in-the-past interpretations in free-standing clauses in Paraguayan Guarani, and narrative-initial clauses in English. These two empirical results gives support to our proposal that evaluation time shift, not tense, derives temporal reference in Paraguayan Guarani.

[51] As mentioned earlier, *kuri* has focusing (and possibly evidential) properties, so opting for the version with *kuri* does not have to be for temporal reasons.

7 Conclusion

We offered an account of temporal interpretation in Paraguayan Guarani without positing tense in the lexical and/or logical semantics. Such an alternative has not been previously explored in the formal semantic literature on tenseless languages. The account relies on the independently motivated mechanism of evaluation time shift. Constraints on evaluation time shift found in the narrative mode in English were shown to be applicable to temporal reference in Paraguayan Guarani as well. Differences obtain in reference to past events, where Paraguayan Guarani applies the mechanism of evaluation time shift more broadly, beyond narratives.

Evaluation time shift is universally available and what varies is the use a language makes of it, depending on other grammatical properties of the language. For example, a language like English that has tense, relegates evaluation time shift to specific genres of narratives (personal narratives, historical narratives, fictional stories, math problems, commentaries, demonstrations, recipes, etc.), often with a stylistic effect. This is also true for Paraguayan Guarani in future contexts, because the language has another grammatical way to express reference to future events . But it has no other grammatical means to achieve a neutral report of a past event other than shifting the evaluation time. Aspectual *kuri* is not in competition with the bare form of predicates because *kuri* does not have a strictly retrospective meaning and because it also contributes other meaning nuances (such as focusing and possibly an evidential meaning).

A final note: a less radical alternative to our account, still within the neo-Reichenbachian tradition, and preserving the core idea of evaluation time shift, could posit that Paraguayan Guarani has a single tense: covert present tense. Present and future reference would be derived with this tense, while past reference would still be achieved through evaluation time shift, in the absence of a past or a non-future lexical tense. On that view, the language would not be tenseless, and therefore tense would be preserved as a lexical semantic universal. What would make Paraguayan Guarani different on this alternative account is that temporal reference would be achieved via two distinct mechanisms: lexical tense and backward evaluation time shift. The three empirical arguments that we presented in this paper, as well as the forth one, developed in the Appendix, are arguments against deriving temporal reference uniformly through non-future tense, so they cannot refute this alternative. We note however that if present tense semantics may vary cross-linguistically (Giorgi & Pianesi 1997, a.o.), then this alternative tense account predicts that there would be more variation among languages without overt tense inflection than our tenseless account does. This is not a consequence that we can explore here. But conceptually, we find the uniform account preferable: languages either have lexical tense, or they have to rely on manipulation of the evaluation time parameter to achieve temporal reference.

Appendix: Simultaneous reference to past and present sub-events

A common aspect of the tense accounts is that past vs. present interpretation obtains as the result of underspecification and not of ambiguity. Accordingly, the tense accounts allow reference to an interval that includes the speech time as a final subinterval and also extends back into the past. On our account, the

evaluation time is either the speech time, if default, or an interval distinct from the speech time, if shifted. The two types of accounts make differenr predictions with respect to reference to intervals that extend in the past and also include the speech time as a final sub-interval.

Languages with a covert non-future tense or with lexically unrestricted tense

Simultaneous past and present interpretation is reported to be possible in St'át'imcets (Matthewson 2006), Hausa (Mucha 2013), Washo (Bochnak 2016), and Tlingit (Cable 2017). A representative example from Hausa is in (111) (Mucha (2013): (31b)). The sentence can be analyzed as describing a single event consisting of the two sub-events of John and Peter each playing the guitar. This larger event is presented as ongoing from the perspective of a time interval including the speech time as a final sub-interval and extending back.

(111) Context: *John and Peter only have one guitar so they have to take turns playing. John practiced for an hour and then gave the guitar to Peter, who is now playing.* Can you say:

Su-nà̃ wà̃sā (yâu).
3PL-CONT play today
'They are/were playing today.'

The LF and interpretation of (111) and its counterparts in St'át'imcets, Washo and Tlingit, are in (112). The lexical tense restriction NON-FUT is shown as optional, because it is posited for St'át'imcets and Tlingit, but not for Hausa or Washo.[52]

(112) a. $[_{TenseP}\ [\ \mathrm{T}_i\ \ (\text{NON-FUT})\ ]\ [_{AspP}\ \text{IMPERFECTIVE}\ [_{VP}\ \text{they play today}\ ]]]$

b. ($[\![\,(112a)\,]\!]^{g,c}$ is only defined if no part of $g(i)$ is after t_c. If defined,) $[\![\,(112a)\,]\!]^{g,c} = 1$ iff $\exists e\,[\text{play}(e)(j\&p) \wedge \tau(e) \supseteq g(i) \wedge g(i) \subseteq \text{the day of } \mathrm{t}_c\,]$

Languages with both a present and a past tense

In English, this kind of temporal perspective cannot be achieved with the simple present or past, but needs the present perfect progressive, see (113). The compositional interpretation of the present tense and the perfect higher aspect provides reference to a *perfect time span* bound to the right by the speech time. The progressive viewpoint aspect further determines that the time of the event includes the perfect time span, resulting in a universal-perfect reading. Some speakers also allow an existential-perfect reading with the simple present perfect, in an enriched context where the guitar playing is a regular occurrence and today's instance of it is being reported.

(113) Context: *John and Peter only have one guitar so they have to take turns playing. John practiced for an hour and then gave the guitar to Peter, who is now playing.* Are the following acceptable in this context?

a. # They were playing today.
b. # They played today.
c. # They are playing today.
d. # They play today.
e. They have been playing today.
f. % They have played today.

We present below the results of a test with monolingual Spanish speakers from Paraguay and from Spain, largely confirming that Spanish is like English in this respect: native speakers of the two varieties of Spanish mostly select the present perfect or present perfect progressive in contexts like (111)/(113).

[52] While in Hausa the viewpoint aspect in (111)/(112a) is imperfective, in the corresponding sentences in Tlingit it is perfective, Cable (2017): 657, and in St'át'imcets it can be perfective or imperfective, Matthewson (2006): 681-683. This does not affect the argument that languages with a non-future tense allow reference to intervals containing both past times and the speech time.

Predictions for Paraguayan Guarani

The tense accounts applied to Paraguayan Guarani predict that the language should be like St'át'imcets, Hausa, Washo and Tlingit: the counterpart of (111) should be acceptable. Our account, on the other hand, predicts that such simultaneous past and present interpretations should not be possible. This prediction rests on the assumption that a shifted evaluation time is fully distinct from the speech time, and cannot both include the speech time and extend backwards.[53] Therefore, the Paraguayan Guarani counterpart of the sentence in (111) should either have a present evaluation time or a past one, see (114) for an illustration, and so should be unacceptable in the given context. In other words, Paraguayan Guarani should pattern with languages like Spanish and English that have two tenses, a present and a past one – even though it has none – and not with languages that have a single non-future tense.

(114) a. [*pro* [$_{AspP}$ (IM)PERFECTIVE [$_{VP}$ they play today]]]

b. $[\![\, pro \,]\!]^{s,n} = t_s$; $[\![\, (114a) \,]\!]^{s,n} = 1$ iff $\exists e\,[\text{play}(e)(j\&p) \wedge \tau(e)$ AT $t_s \wedge t_s \subseteq$ the day of $t_s\,]$

c. $[\![\, pro \,]\!]^{s,n} = t_n$; $t_n < t_s$;
$[\![\, (114a) \,]\!]^{s,n} = 1$ iff $\exists e\,[\text{play}(e)(j\&p) \wedge \tau(e)$ AT $t_n \wedge t_n \subseteq$ the day of $t_s\,]$

Importantly, this different prediction highlights how evaluation-time denoting *pro* differs from reference-time denoting T_i of the covert lexical tense accounts (see (31) and (32)). The grammatical properties of the abstract parameter of evaluation time – fixed to the time of the speech context or to the time of a context distinct from the speech context – place constraints on the kinds of temporal intervals that can be referents to indexical *pro*, while non-indexical T_i is free of such constraints and may refer to intervals that extend back from the speech time.

Testing the predictions of the tense and tenseless accounts for Paraguayan Guarani

We presented a similar context to (111) together with several sentence variants in Paraguayan Guarani and in Spanish to bilingual speakers in written questionnaires. Within-subject results are particularly important, as the participants' choice among the explicitly tensed sentences in Spanish can reveal how they are interpreting the sentences in Paraguayan Guarani. This constraining factor adds a crucial, and novel, dimension to the test. We further administered the written questionnaires to monolingual speakers of Spanish, as spoken in Paraguay and to monolingual speakers of Spanish from Spain, in order to identify potential differences between the two variaties of Spanish, which in turn could be influencing the Paraguayan Guarani responses of the bilingual participants from Paraguay. The cross-dialectal application also adds a novel dimension.

We asked the participants to select the sentence(s) in (115) and (116) that can describe well the presented situation. The prompt and context were given in Spanish, and the participants could select any of the given options, including all or none.[54]

(115) Context: *This morning María was playing the guitar. Later in the afternoon Juan came, and María gave him her guitar. Now, Juan is playing the guitar.*
Which sentence or sentences describe adequately / appropriately María and Juan's activity today?

a. Ko ára-pe, ombopu hikuái mbaraka.
this day-LOC 3-play they guitar

[53] We note however that this is not an assumption that Anand & Toosarvandani (2018a) make. Theirs is the only account to have considered properties of the shifted evaluation time, as far as we know.

[54] We distributed two questionnaires to the bilingual participants that differed in minor ways in how the item was presented. In the first questionnaire (Q1) we asked participants to select the sentence(s) that describe the situation *adequately* (*adecuadamente)* and the Spanish sentences used proper names; in the second questionnaire (Q2) we used the adverb *apropiadamente* 'appropriately' and the Spanish sentences used null pronouns. There were no substantial differences in the results to the two questionnaires, and so we report the aggregate data. The monolingual participants completed the Spanish part of the second questionnaire.

b. Ko ára-pe, ombopu hína hikuái mbaraka.
this day-LOC 3-play CONT they guitar

c. Ko ára-pe, ombopu kuri hikuái mbaraka.
this day-LOC 3-play RETROSP they guitar

d. Ko ára-pe, ombopu hína kuri hikuái mbaraka.
this day-LOC 3-play CONT RETROSP they guitar

(116) Context: *This morning María was playing the guitar. Later in the afternoon Juan came, and María gave him her guitar. Now, Juan is playing the guitar.*
Which sentence or sentences describe adequately / appropriately María and Juan's activity today?

a. Hoy, (María y Juan) tocan la guitarra.
today María and Juan play.PRES.3PL the guitar
'Today, María and Juan are playing the guitar.'

b. Hoy, (María y Juan) están tocando la guitarra.
today María and Juan be.PRES.3PL play.PART the guitar
'Today, María and Juan are playing the guitar.'

c. Hoy, (María y Juan) tocaron la guitarra.
today María and Juan play.PERF.PAST.3PL the guitar
'Today, María and Juan played the guitar.'

d. Hoy, (María y Juan) han tocado la guitarra.
today María and Juan have.PRES.3PL play.PART the guitar
'Today, María and Juan have played the guitar.'

e. Hoy, (María y Juan) han estado tocando la guitarra.
today María and Juan have.PRES.3PL be.PART play.PART the guitar
'Today, María and Juan have been playing the guitar.'

Bilingual study

A total of 34 bilingual speakers completed a questionnaire; we analyze the responses of 27 of them, summarized in Table 5.[55,56]

	# participants	Paraguayan Spanish	Paraguayan Guarani
a.	9	present (progressive)	∅ (*hína*)
b.	2	past	∅ (*hína*)
c.	11	present perfect (progressive)	∅ *kuri* (*hína*)
d.	5	present perfect progressive	∅ (*hína*)

Table 5 Within-participant responses on Q1 or Q2: 27 bilingual speakers

[55] We excluded one participant because they reported weak command of written Guarani (answering "yes, but very little" to a preliminary question of whether they could read and write in Guarani) and our test was in written form. Additionally, 3 participants had to be set aside as they did not provide any substantive data on these items: two of them selected *all* sentences, and one selected *none*, in *both* the Paraguayan Guarani and Spanish items. Finally, 3 more participants were also set aside as they either did not provide a response on one of the languages or selected all options, thus precluding the possibility of analysis of linked responses.

[56] In Table 5 we classify the combined responses to Paraguayan Guarani (115a) and (115b) as ∅ (*hína*), and those to (115c) and (115d) as ∅ *kuri* (*hína*). (The ∅ stands for a covert lexical tense, or the tense supplied by a semantic rule, or for the absence of tense, according to the different approaches.) The responses to Spanish (116a) and (116b) are similarly combined and classified as *present (progressive)*, and those to (116d) and (116e) as *present perfect (progressive)*.

When Paraguayan Guarani is considered in isolation, the tense and tenseless accounts make different predictions for the ∅ (*hína*) category. The tense accounts predict that *all* participants would select the sentences in this category, (115a) and (115b), in line with the results reported for St'át'imcets, Hausa, Washo and Tlingit. In contrast, our tenseless account predicts that *none* of the participants would accept these sentences, similarly to the judgments for English and Spanish discussed above. The results for (115a) or (115b) are at first glance unexpected on both types of accounts: *some but not all* participants selected them, specifically 16/27, as can be seen in Table 5, rows a), b), and d).

This is where it becomes relevant that our participants also did the task in Spanish. The Spanish responses in rows a) and b) reveal that the corresponding ∅ (*hína*) responses are either present or past, and thus not problematic for our account. On the contrary, even though the Spanish results are unexpected, the within-participant responses in the two languages conform to our predictions. Our tenseless account predicts that Paraguayan Guarani ∅ (*hína*) would be selected by a participant *if and only if* the same participant selects the Paraguayan Spanish present (progressive) or past tense sentences. The combined results in rows a) and b) are in line with this bi-directional prediction. In contrast, the tense accounts are merely compatible with the results of row a) and b) but do not predict these linked responses.

Thus, it turns out that of the 16/27 participants whose results initially seemed problematic for our account, 11/27 are not. The remaining 5/27 participants (row d)) violate the predictions of our account and are compatible with the tense accounts.

Turning to row c), we see support for our account but not for the tense accounts. Our account makes the prediction that Paraguayan Guarani ∅ *kuri* (*hína*) would be selected by a participant *if and only if* the same participant selects the Paraguayan Spanish present perfect (progressive). The 11/27 participants in row c) meet this prediction. The tense accounts, however, predict that given their selection of a Spanish present perfect (progressive), participants may select Paraguayan Guarani ∅ *kuri* (*hína*) but they should also select Paraguayan Guarani ∅ (*hína*). Yet this is not what row c) shows.

To conclude:

(117) a. 11/27 predicted by no-tense account; violate the predictions of tense accounts (row c))
b. 11/27 predicted by no-tense account; compatible with tense accounts (rows a) and b))
c. 5/27 violate the predictions of no-tense account; compatible with tense accounts (row d))

Thus the linked responses of 81% of the participants, 22/27, are predicted on the no-tense account. It is not clear that we can conclude anything definitive about the other 19%, 5/27. Short of conducting an experimental study to more clearly control variation, we interpret the results of the questionnaires as supportive of our proposal that there is a (dominant) Paraguayan Guarani grammar that does not have tense, even if that characterization only covers 81% of our participants.

Individual discussions with three of our primary consultants confirm that they accept the Paraguayan Guarani ∅ (*hína*) sentences, (115a) and (115b), when they also accept the Paraguayan Spanish present tense sentences, (116a) and (116b). We also presented the consultants with a version of the sentences where we changed the adverbial from *ko ára-pe* 'this day-LOC', *today*, to *ko pyharevé-pe guive* 'this morning-LOC from', *since this morning*, keeping the rest of the sentences and the context the same. This change facilitated the targeted reading: our consultants chose the examples with *kuri* (*hína*) and the present perfect (progressive). The fieldwork interviews confirm our general interpretation of the results of the questionnaires.

More generally, our results call for caution in interpreting the results of this test cross-linguistically. As we saw, a number of our participants flouted the presupposition of the test and selected a present or a past response for Spanish, and then also accepted a bare form in Paraguayan Guarani. Had only their Paraguayan Guarani responses been available, we would have reached the wrong conclusion that their grammar contains a single non-future tense.[57]

[57] A note about the limitations of this task: One of the speakers who answered all 'yes' and who we excluded, when further questioned, said that her choice depends on which aspect of the described situation she focuses on. This is what may also have been going on for speakers in lines a) and b) in Table 5. Some speakers apparently find it difficult to describe with a single sentence an event that has sub-events with different agents and occur at different times.

Monolingual study

10 monolingual speakers of Paraguayan Spanish and 10 monolingual speakers of Castilian Spanish completed Q2. One participant in each group answered *none* on the choices for this item, presumably finding the task difficult or unnatural (see footnote 57). Results of the remaining 9 participants in each group are presented in Tables 6 and 7.

	# participants	Paraguayan Spanish
a.	1	present
b.	2	past
c.	6	present perfect (progressive)

Table 6 Responses on Q2: 9 Paraguayan Spanish monolingual speakers

	# participants	Castilian Spanish
a.	2	present (progressive) present perfect progressive
b.	7	present perfect (progressive)

Table 7 Responses on Q2: 9 Castilian Spanish monolingual speakers

The results of the two monolingual groups and the bilingual group are broadly similar: as expected, most participants selected the present perfect (progressive), and some selected the present (progressive), no matter the variety of Spanish. One difference is that the past was selected only by the Paraguayan Spanish speakers: in this, the monolingual speakers behaved like the bilingual speakers (cf. Table 6 and Table 5). A related difference is that only speakers of Castilian Spanish uniformly selected the present perfect (progressive), even if two of them also selected the present (progressive). If these differences are grammatically meaningful, they are in favor of our account, illustrating that the use of ∅ (*hína*) in the relevant contexts is not linked to a non-future interpretation but to either a past or a present one.

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