

Genuinely tenseless: encoding time in Cantonese*

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Abstract Languages without overt marking of tense have been commonly analyzed as having covert tense, either in the form of a phonologically null tense morpheme or a post-LF semantic rule. We argue that the notion of (neo-Reichenbachian) tense is not only unnecessary for the analysis of Cantonese, but also falls short of accounting for temporal reference in this language. Following Pancheva & Zubizarreta (2020, to appear) on Paraguayan Guarani, we propose an analysis of Cantonese that manipulates the temporal parameter of the evaluation context in lieu of tense. A more general contribution of this line of work is the proposal that tense is not a semantic universal.

Keywords: temporal reference, tenselessness, evaluation time shift, Cantonese

1 Introduction

This paper focuses on (Hong Kong) Cantonese, a language that lacks overt tense morphology. A sentence like (1), with an atelic predicate that is not overtly marked for aspect nor modified by a temporal adverb, is temporally underspecified: it may describe an eventuality that is ongoing/holds at the speech time or at a past time. The former is the default reading (the sentence can begin a discourse); the latter reading requires a richer context (the sentence needs to answer an explicit or implicit question about a past time). In languages with obligatory tense such as English, the former interpretation is conveyed by the PRESENT and the latter by the PAST tense.

- (1) ngo zyu hai Hoenggong
I live at Hong Kong
(i) ‘I live in Hong Kong.’
(ii) ‘I lived in Hong Kong.’ (in reply to “Where did you live **last year**?”)

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Our goal is to propose an analysis of temporal reference in Cantonese without an appeal to tense. We follow Pancheva & Zubizarreta (2020, to appear) in using the setting of the temporal parameter of evaluation as a means for achieving present and past reference. The parametric difference between the temporal systems of Cantonese and English (putting aside aspect) is located in (i) the inventory of their functional lexicons: Cantonese lacks tense morphemes; and in (ii) the wider application of the mechanism of evaluation time shift in Cantonese vs. English.

In addition to our contribution to the understanding of tenselessness, we also make a proposal about the aspectual system of Cantonese. We suggest that the language has a null imperfective aspect, which combines only with atelic eventualities, outside of narratives and a few other restricted contexts (e.g., newspaper headlines). In those special contexts, the imperfective aspect is used more broadly, with all eventuality types. Although we do not develop a formal account of this distribution, we draw parallels to the variable use of aspect in and outside of narratives (and headlines) in English and several other languages.

In this paper we are only able to discuss the temporal interpretation of matrix clauses. A full account of temporal reference in Cantonese, considering attitude complements and clausal adjuncts, will have to wait another occasion.

2 Tense and apparent vs. genuine tenselessness

Tense and aspect are the key linguistic resources for the clause-level temporal grounding of eventuality descriptions. Following the insight of Reichenbach (1947) that temporal reference involves an abstract parameter of *reference time* (RT) linking the time of the described eventuality (ET) to the speech time (ST), neo-Reichenbachian approaches (Klein 1994, a.o.) attribute to tense the grammatical role of situating the RT relative to the ST (in matrix clauses), leaving to the various aspects (perfect, perfective/imperfective, etc.) the role of situating the ET relative to the RT. Such approaches have proven very successful in the analysis of the temporal systems of languages from a wide range of families, and have led to the discovery of persistent similarities, along with constrained variation, among their tenses and aspects, revealing the existence of universal components of temporal meaning. These successes have been replicated in languages that have no overt tense morphemes or whose tense morphemes are optional. As a result, it is now possible to make fine-grained empirically-grounded proposals about the properties of tense, as distinct from aspect, in such ‘tenseless’ or ‘optionally-tensed’ languages, for instance, argue for the existence of both a quantificational tense and a pronominal tense in the same language (Chen, Vander Klok, Matthewson & Rullmann 2020), or attribute variation in the interpretation of complement clauses to a sequence-of-tense parameter in conjunction with a mechanism for *de re* interpretation of embedded tense (Bochnak,

Hohaus & Mucha 2019).

But do all languages have tense? More concretely, in line with the neo-Reichenbachian definition, do all languages have a semantic mechanism (a morpheme or a rule) dedicated to introducing in the logical form an RT in relation to the ST (in matrix clauses)? The RT is the contextually salient time which sets the speaker's temporal perspective for the description of the eventuality. For instance, in the familiar example from Partee (1973), *I didn't turn off the stove*, the RT is the last time the speaker had the stove on before leaving the house. The PAST morpheme refers to that RT, like a pronoun (as was Partee's point), presupposing that the RT is temporally situated before the ST. So the question is, do all languages have morphemes or rules that perform the role of the English PAST, identifying an RT in relation to the ST (whether the mechanism is pronominal or not)?

Formal semantic approaches so far have maintained that tense is indeed a semantic universal. If a language lacks overt tense morphemes or its tense morphemes are optional, the language is said to either have phonologically covert tense in its lexicon (e.g., NON-PAST, whose lexical semantics specifies that the contextually salient RT is before or at the ST) or to make use of a rule that supplies non-lexical tense in the semantic component (e.g., "interpret AspP as being predicated of the contextually salient RT"). Possibly, the analytical choice to maintain a formal role for tense in the absence of an overt realization is rooted in the success of the cross-linguistic research within the neo-Reichenbachian tradition: a system that works for languages that unquestionably have tense can be applied seamlessly to all languages. Yet we contend that the neo-Reichenbachian perspective in fact invites the question of whether tense is universal. Given that the role of tense is formally distinct from that of aspect, the analytical possibility arises that a language may lack tense while having aspect. This fits the surface profile of many of the languages without overt morphemes for tense, given that they typically have a rich inventory of aspectual morphemes: if such languages lack tense altogether, the covert/overt distinction would not be an accident. The challenge is to develop a formal system that can derive temporal reference without tense.

Pancheva & Zubizarreta (2020, to appear) provide such a system and apply it to Paraguayan Guarani, a language without overt tense morphemes, which has been previously analyzed as achieving temporal reference via a rule (Tonhauser 2011). A closely related language, Mbyá Guarani, has been argued to have a phonologically covert NON-PAST tense as well as an optional overt PAST tense (Thomas 2014). Pancheva & Zubizarreta (2020, to appear) propose that Paraguayan Guarani lacks tense altogether – it has no morphemes such as NON-PAST and no recourse to a post-LF tense rule – and that, in the absence of tense, it uses an independent mechanism, presumably universally available: manipulation of the time parameter of the context of evaluation. Here, we apply this system to Cantonese.

3 Analyses of Cantonese with and without tense

3.1 An illustration of the tenseless approach and its application to Cantonese

Sentences are evaluated relative to a context, c , with the time of the context t_c being the relevant parameter of evaluation here: $\llbracket \phi \rrbracket^c$ is true iff ϕ is true at time t_c . The ST is the default evaluation time (EvalT), but this may shift in narratives, as can be seen in the case of the *narrative present* that alternates with the canonical past tense in the following excerpt from *Seinfeld*, episode 84: *The Fire*.

- (2) I jumped on the bus. [...] then all of a sudden, this guy *pulls* out a gun. [...] so I got out of the seat and I started walking towards him. [...] Then everybody *is* screamin', because the driver, he's passed out from all the commotion [...] the bus *is* out of control! So, I *grab* him by the collar, I *take* him out of the seat, I *get* behind the wheel and now I'm drivin' the bus.

Tense does not change its meaning in such narratives; rather, the EvalT switches from the default ST to the past time of the narrative. Tense always locates the RT relative to the EvalT (this updates our earlier statement on the role of tense, substituting ST by the more general EvalT). When the EvalT is the default, the ST, PAST is used (*I jumped on the bus*), since the RT – set at the time of the narrative – is prior to the EvalT. When the EvalT shifts to the time of the narrative, PRESENT is used (*I grab him by the collar*), since the RT is now at the EvalT.

On the other hand, the semantic mechanism of EvalT shift is independent of tense. And as this mechanism is not tied to a lexical item, it can be expected to be universally available, on the assumption that cross-linguistic differences are restricted to the contents of the functional lexicons. Pancheva & Zubizarreta (2020, to appear) suggest that in Paraguayan Guarani, the manipulation of the EvalT can achieve present and past reference: the default setting of EvalT as the ST derives present reference and the shift of EvalT to a time prior to the ST derives past reference.

We extend this idea to the analysis of Cantonese. When (1) is evaluated relative to the speech context, s , the sentence is interpreted as present: the described state holds of the ST, t_s , (3a). When (1) is evaluated relative to a different context, n , whose time is before the ST, the sentence is interpreted as past: the described state holds of the past time, t_n , (3a). The two readings obtain without the involvement of tense. And because the first reading involves the default setting of the EvalT, the analysis predicts that it is the default reading, which matches the observed facts.

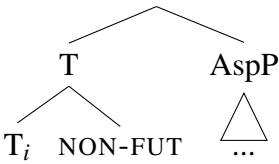
- (3) a. $\llbracket (1) \rrbracket^s = 1$ iff the speaker lives in Hong Kong at t_s
 b. $\llbracket (1) \rrbracket^n = 1$ iff the speaker lives in Hong Kong at t_n , where $t_n < t_s$

We further suggest, following Pancheva & Zubizarreta (2020, to appear), that the mechanism of evaluation time shift, while universally available, is subject to potentially varied restrictions across languages. In English, it is restricted to narratives and is not available to single free-standing sentences, i.e., sentences that start dialogues, or answer questions (putting aside possible uses in newspaper headlines). In Cantonese this restriction does not obtain in the case of reference to past events. It remains unclear to us what drives the restriction in the first place, so for the time being this aspect of the proposal will have to remain at the descriptive level, but it is likely the case that the competing presence of (overt) tense in English plays a significant role in restricting the use of the evaluation time shift mechanism.

3.2 Tense approaches to Cantonese and Mandarin

No formal compositional semantic account has been proposed for Cantonese, to the best of our knowledge. Sybesma (2004) presents a schematic account with tense operators in the C domain binding null pronominal tense features expressed in a Tense node. Given the semantic content attributed to two of the operators, the proposal amounts to a suggestion that Cantonese has overt semantic PRESENT and PAST tense. In particular, the operator *ge*, with the meaning of ‘and this is how it is’ sets the value of the tense feature as [–past], and the operator *lei*, with the meaning of ‘and this is how it was’ sets the value of the tense feature as [+past]. There is a third operator, which is phonologically null, with the ‘neutral’ meaning of ‘here-and-now’; this operator leaves the value of the tense feature underspecified, to be set by adverbials or the linguistic context. This third structure yields both present and past interpretations, with the tense feature specified [–past] or [+past], respectively. Presumably, this is the structure that would be behind the Cantonese sentence in (1), and derive its two readings. We take this structure to involve covert tense, though the details of its semantics remain unclear.

A closely related language, Mandarin, which also lacks overt tense morphology (Klein, Li & Hendriks 2000; Smith & Erbaugh 2005; Sybesma 2007, a.o.), has been analyzed in formal semantic accounts as having tense. Null tense approaches propose that Mandarin has phonologically covert tense morphemes, in addition to overt aspect morphemes. (Sun 2014; He 2020). For instance, Sun (2014) argues that Mandarin has a null temporal pronoun, T_i , projecting a Tense phrase, as in (4a). The pronoun denotes the contextually salient RT, (4b), and it is lexically restricted by a NON-FUT tense feature that presupposes that the RT is before or at the EvalT, (4c). (The details in (4) are slightly modified from Sun 2014: §5.3.1.) In an otherwise very similar approach, He (2020) argues that Mandarin has two lexical tense features, PRESENT and PAST, rather than a single NON-FUT.

- (4) a. 
- b. $\llbracket T_i \rrbracket^{g,c} = g(i)$
- c. $\llbracket \text{NON-FUT} \rrbracket^{g,c} = \lambda t : \text{NO PART OF } t \text{ IS } > t_c. t$

If applied to Cantonese, both of these null tense approaches would derive the fact that (1) has two readings, a present and a past one, although the former approach would treat this as underspecification, while the latter approach, as ambiguity.

A different kind of tense approach is developed by Lin (2006, 2010): no tense is projected in the syntax, but a past tense is nevertheless bundled with perfective viewpoint aspect in the lexicon. Consider the lexical entries in (5) (Lin 2006: ex. (8), (5b)), where t_{TOP} is an RT variable and t_0 is an EvalT variable. The lexical semantics for PERFECTIVE aspect encodes an additional temporal relation: the RT precedes the EvalT ($t_{\text{TOP}} < t_0$). Effectively, a PAST tense is introduced in the semantics, even if not in its own syntactic projection.

- (5) a. $\llbracket \text{PERFECTIVE} \rrbracket = \lambda P_{\langle i,t \rangle} \lambda t_{\text{TOP}} \lambda t_0 \exists t [t \subseteq t_{\text{TOP}} \wedge P(t) \wedge t_{\text{TOP}} < t_0]$
- b. $\llbracket \text{IMPERFECTIVE} \rrbracket = \lambda P_{\langle i,t \rangle} \lambda t_{\text{TOP}} \exists t [t_{\text{TOP}} \subseteq t \wedge P(t)]$

Lin (2006) further proposes two rules, as in (6) (Lin's ex. (6), paraphrased), to derive the right interpretation for LFs with the viewpoint markers in (5).

- (6) a. If ϕ , a translation of a matrix sentence, is of type $\langle i,t \rangle$, the ST is assigned as the value of the EvalT variable t_0 or the RT variable t_{TOP}
- b. If ϕ , a translation of a matrix sentence, is of type $\langle i, \langle i,t \rangle \rangle$, the RT variable t_{TOP} is existentially closed

A matrix clause LF with IMPERFECTIVE viewpoint aspect is of type $\langle i,t \rangle$ and so is subject to rule (6a). Accordingly, the unsaturated RT variable t_{TOP} is assigned the value of the ST, and the sentence receives a present interpretation. On the other hand, PERFECTIVE viewpoint aspect makes the clause of type $\langle i, \langle i,t \rangle \rangle$ (since it has an extra time argument, t_0) and thus subject to rule (6b). The unsaturated RT variable t_{TOP} is existentially closed, and then rule (6a) applies, and assigns the ST as the value of the EvalT variable t_0 . The result is an existential past interpretation.

This approach too can derive the two readings of the Cantonese sentence in (1), on the assumption that the language has null versions of the two viewpoint aspects.

We turn next to a discussion of the aspectual system of Cantonese, followed by a more detailed illustration of the tenseless account and several arguments in its favor.

4 The role of aspect in Cantonese

We assume that vPs in Cantonese denote predicates of eventualities – states, activities, or telic events – and thus viewpoint aspect is necessary to turn them into predicates of times. This fairly standard assumption allows us to view Cantonese as not being radically different from other languages for which viewpoint aspect is obligatory. But this means that in the absence of an overt viewpoint aspect, we need to posit a covert one. This is in line with proposals for Mandarin (e.g., Lin 2006).¹

4.1 Bare predicates

We first focus on temporal reference in matrix sentences with bare predicates, i.e., predicates without an overt aspectual marker. We see that aktionsart affects whether the sentences are interpreted as describing present or past eventualities.

Sentences with bare atelic predicates – states, as in (1) or in (7a) below, and activities, as in (7b) – have a default present reading, but they are also compatible with a past episodic reading, if there is a salient past time interval in the discourse.²

(7) Bare atelic predicates

- a. Aaming m syufuk. keoi taau-tong
Aaming not feel.well he head-pain
Present: ‘Aaming is not feeling well. He has a headache.’
Past: ‘Aaming wasn’t feeling well. He had a headache.’
(in reply to “Why didn’t Aaming come **yesterday**?”)
- b. Aaming jatgojan/ hai gungjyun daa laamkau
Aaming alone/ at park play basketball
Present: ‘Aaming is playing basketball on his own/ in the park.’
(in reply to “What is Aaming doing right now?”)
Past: ‘Aaming played basketball on his own/ in the park.’
(in reply to “What did Aaming do **yesterday**?”)

1 Sun (2014) does not posit null aspect for Mandarin, given that all eventive predicates, activities included, require overt aspect for episodic reference, unlike statives which can appear bare. To capture the difference, Sun (2014) proposes that only eventive vPs denote predicates of eventualities, and thus require viewpoint aspect; stative vPs denote predicates of times, and thus do not need to combine with aspect. However, see He (2020) for arguments against this approach.

2 In most cases, bare activities are interpreted generically and not episodically, but the addition of a locative/manner adverb, as in (7b), can give rise to an episodic reading. Similar facts have been reported in Mandarin, see e.g., (i), from Lin (2003b).

(i) ta zai fangjian du shu
he in room study book
‘He is studying in his room.’
Mandarin, Lin (2003b)

Bare telic predicates are disallowed in matrix sentences (outside of narrative contexts, to which we return later), yielding neither present nor past interpretations. Overt aspectual marking is required, as shown in the contrasts in (8).³ Parallel facts are reported in Mandarin (Klein et al. 2000; Sun 2014; He 2020).

(8) Bare telic predicates

- a. Aaming ??dou/ OKdou-zo Hoenggong
 Aaming arrive arrive-PERF Hong.Kong
 Not available: ‘Aaming is arriving/arrived in Hong Kong.’ (bare)
 Past: ‘Aaming arrived in Hong Kong.’ (with *zo*)
- b. Aaming ??sik/ OKsik-gan jat-gin daangou
 Aaming eat eat-PROG one-CL cake
 Not available: ‘Aaming is eating/ate a piece of cake.’ (bare)
 Present: ‘Aaming ate a piece of cake.’ (with *gan*)

We conclude that a null aspect is available only for atelic predicates. We suggest that the meaning of the null aspect is imperfective. This is in line with proposals that imperfective is the default viewpoint aspect for atelic predicates (e.g., Bohnemeyer & Swift 2004). The imperfective meaning is straightforward in the case of present reference, since the interpretation is that the ET contains the ST. In the case of past reference, an imperfective meaning may seem less fitting: e.g., (7b) describes a completed event, as reflected in the English translation, which uses the simple past rather than the past progressive. However, such a role for the imperfective is not without precedent: in the Slavic languages, to a varied extent, imperfective aspect can be used to describe completed events (the ‘general-factual’ use, see e.g., Comrie 1976; Grønn 2004; Altshuler 2012; Klimek-Jankowska 2022). We cannot engage here the complexity of the issue; we simply note that defining the Cantonese null imperfective only for atelic predicates, and encoding the relation between the time

³ However, as also suggested in Lin (2003a) for Mandarin, bare telic predicates can be used without aspectual marking in serial verb constructions or ‘disposal’ constructions (the latter are the Cantonese counterpart of the Mandarin *ba*-construction (Li 2017)). Two examples are given in (i).

(i) Bare telic predicates without overt aspect

- a. ngo gon Aaming ceot fosat serial verb constructions
 I expel Aaming leave classroom
 Past: ‘I kicked Aaming out of the classroom.’
- b. Aaming zoeng ngo bong hai dang dou disposal constructions
 Aaming DISPOSAL I tie at chair place
 Past: ‘Aaming tied me to (a) chair.’

Given the scope of this paper, we do not attempt an explanation as to why bare telic predicates are acceptable in precisely these contexts. See also discussion in section 6.2.

argument of aspect and the ET in terms of containment, as in (9), rather than proper containment, as would befit the English progressive, would yield the needed result.

$$(9) \quad \llbracket \emptyset \text{ IMPERFECTIVE} \rrbracket = \lambda P_{\langle v, t \rangle} : P \text{ is atelic. } \lambda t \exists e [P(e) \wedge t \subseteq \tau(e)]$$

Given its presupposition, the null imperfective aspect cannot combine with the telic predicates in (8). The past reading of (7) is compatible with the time variable of aspect being either coextensive with, or properly included in, the ET. In the case of (7b), the former interpretation is appropriate as an answer to *What did Aaming do yesterday?*, and the latter as an answer to *What was Aaming doing when you called?*.

4.2 Overt aspect

Sentences whose predicates have imperfective marking (e.g., the progressive *-gan*, the durative *-zyu*) allow both present (as default), and past interpretation (with richer context), regardless of aktionsart (see (10a-b)). This provides indirect support for our suggestion that the phonologically null aspect is imperfective: the progressive, durative and null aspect behave alike in their effect on temporal reference.

(10) Imperfective marking

- a. ngo se-gan jat-fung seon
 I write-PROG one-CL letter
 Present: 'I am writing a letter.'
 Past: 'I was writing a letter.' (in reply to "What did you do **at 7am**?")
- b. ngo daai-zyu hauzaau
 I wear-DUR mask
 Present: 'I am wearing a mask.'
 Past: 'I was wearing a mask.'
 (in reply to "Why did no one recognize you **yesterday**?")

Sentences whose predicates have perfective marking can only convey a past interpretation. We already saw this in (8a), which has a telic predicate. Perfective aspect leads to a past interpretation also with atelic predicates (cf. (11) vs. (7b), (1)).

(11) Perfective marking

- a. ngo daa-zo laamkau
 I play-PERF basketball
 Past: 'I played basketball.'
- b. ngo zyu-gwo hai Hoenggong
 I live-EXP at Hong Kong
 Past: 'I lived in Hong Kong.'

The link between perfective aspect and past interpretation holds for Mandarin as well. This link motivates Lin (2006) to incorporate the meaning of past tense into the lexical semantics of perfective aspect (as in (5a)). However, it is possible to account for the temporal effect of perfective aspect without an appeal to a built-in past tense. Cross-linguistically, perfective aspect resists present interpretation – this is known as the *present-perfective restriction* (Comrie 1976, a.o.). The restriction is not due to the present tense, but to properties of the ST, and so it can be expected that the restriction would obtain universally, regardless of the presence or absence of tense. And so it should not be surprising that Cantonese is no exception to the restriction. As for an explanation for the present-perfective restriction, we suggest, following Ogihara (2007), that there is a grammatical requirement that if the described eventuality overlaps the ST, then it has to hold/obtain *throughout the ST*. But perfective aspect creates predicates of times that contain the ET, and after combination with present tense, or after the application of an alternative mechanism in the absence of tense (which we discuss in §5), the resulting interpretation is that the ST contains the ET. Perfective aspect thus precludes present episodic interpretation.

4.3 Summary

It should be noted that all sentences from (7) through (11) lack a future reading. Future reference requires overt marking (more on this in §5.3).⁴ see Sun (2014); He (2020) for this observation for Mandarin.

Table 1 summarizes the interpretation of bare and overtly-marked predicates.

	Bare atelics & Imperfectives	Perfectives
Present	✓ _{default}	✗
Past	✓	✓
Future	✗	✗

Table 1 Temporal reference of episodic sentences in Cantonese

There are three desiderata for any account on temporal reference in Cantonese: (i) the present-past flexibility of bare atelic predicates and predicates overtly marked with imperfective aspect (in pink), (ii) the perfective-past connection (in blue), and (iii) the restriction on future interpretation (in green). Given our suggestion that Cantonese has a null imperfective aspect, restricted to atelic predicates, (i) amounts to the generalization that imperfective allows both present and past interpretations. And

⁴ Futurates, following Copley (2008), can be analyzed as containing a null morpheme encoding plans.

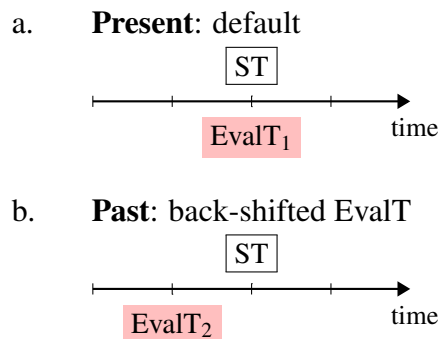
as we noted, this flexibility is not available to perfective aspect, for an independent reason, accounting for (ii). Nothing about (i) and (ii) necessitates the presence of tense in Cantonese, and in §5 we demonstrate how a tenseless account can capture these generalizations. On the other hand, (iii) presents a challenge and in fact it motivates the tense accounts for Mandarin where it also holds: if the language had only a single NON-FUTURE tense (Sun 2014) or only a PRESENT and a PAST tense (He 2020), future reference would not be possible without a prospective morpheme.

5 An elaboration of the tenseless account for Cantonese

5.1 Two evaluation times

Following Pancheva & Zubizarreta (2020, to appear), we propose that in the absence of tense, manipulation of EvalT is responsible for temporal reference. By default, sentences are evaluated relative to the speech context, and the EvalT is the ST, giving rise to a present interpretation, as depicted in (12a). If the EvalT is back-shifted from the ST (when the sentence is evaluated under a different context), then a past reading obtains, as in (12b). There is no need to posit tense in Cantonese.

(12) Default and back-shifted EvalT



Nothing so far rules out the possibility of interpreting sentences with respect to a forward-shifted EvalT. But as we will see in §5.3, forward shift is additionally restricted in Cantonese, just like it is in English, and only applies to narratives, and a few other cases like newspaper headlines. Backward shift applies more freely in Cantonese than it does in English and is possible in free-standing clauses.

We implement the idea under a bi-contextual evaluation approach (Schlenker 2004; Sharvit 2004, 2008; Pancheva & Zubizarreta 2020, to appear, a.o.). Two evaluation times are provided by two evaluation contexts: the actual speech context s , and another context n . We further suggest that there is an indexical temporal *pro* in the left periphery of clauses (of type i), whose value is sensitive to different evaluation contexts (cf. the syntactically represented ST in Kusumoto 2005, a.o.).

This indexical *pro* binds the time argument of the aspect phrase (of type $\langle i, t \rangle$).

- (13) a. $\llbracket pro \rrbracket^{s, n} = t_s$ (a default EvalT)
 b. $\llbracket pro \rrbracket^{s, n} = t_n$, where $t_n < t_s$ (a back-shifted EvalT)

Strictly speaking, the EvalT is not “shifted” or overridden; but an additional EvalT, which precedes the ST, is introduced by a second context.

5.2 Present-past flexibility of imperfectives and perfective-past connection

Sentences can be evaluated at the ST, or at a back-shifted EvalT, mediated by the different values of indexical *pro*. This is the case independently of viewpoint aspect marking. The differential effect of imperfective and perfective aspect on temporal reference is due to an independent present-perfective restriction.

The present-past flexibility of sentences with imperfectively-marked predicates (point (i) from §4.3) obtains because no interpretative conflict arises between the semantics of aspect and the two EvalTs. Both (14a) and (14b) below are sensibly interpretable. The former is the default because the ST is the default EvalT.

(14) LF and interpretation of (1)

$[_{CP} pro \dots \lambda t \exists e [\text{live-in-HK}(e)(\text{speaker}) \wedge t \subseteq \tau(e) \wedge (t \subseteq \text{now/last.year})]]$

- a. $\llbracket (1) \rrbracket^{s, n} = 1$ iff t_s is included in the time during which the speaker lives in Hong Kong ($\wedge t_s \subseteq t_s$)
 b. $\llbracket (1) \rrbracket^{s, n} = 1$ iff t_n is included in the time during which the speaker lives in Hong Kong ($\wedge t_n \subseteq \text{the year before } t_s$)

The perfective-past connection (point (ii) from §4.3) is due to the semantic conflict between the ST and the viewpoint aspect. Interpreting indexical *pro* as the ST, as in (15a), runs into the problem of the present-perfective restriction. The ST may not contain the ET, given the requirement that the eventuality obtain throughout the ST (Ogihara 2007). This requirement is not imposed on EvalTs distinct from the ST. The sentence can be evaluated relative to a context different from the speech context. This renders a past reading, (15b), as the only possible reading of (11a).

(15) LF and interpretation of (11a)

$[_{CP} pro \dots \lambda t \exists e [\text{play-basketball}(e)(\text{Aaming}) \wedge \tau(e) \subseteq t]]$

- a. # $\llbracket (11a) \rrbracket^{s, n} = 1$ iff t_s includes the time during which Aaming plays basketball
 b. $\llbracket (11a) \rrbracket^{s, n} = 1$ iff $t_n: t_n < t_s$ includes the time during which Aaming plays basketball

5.3 The future restriction

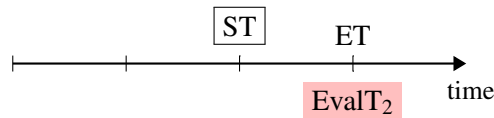
We turn next to the restriction on future reference (point (iii) from §4.3). Reference to future time in Cantonese requires overt marking (e.g., *wui* ‘will’), even when there is a contextually salient future time, or indeed, an overt future adverbial, as illustrated in (16). (The sentence only has a futurate interpretation describing a plan.) Similar facts have been observed for Mandarin (Lin 2006; Sun 2014).

(16) The restriction on future reference in Cantonese

??Tingjat, Aaming jyusoeng jingoi.
 Tomorrow Aaming encounter accident
 ‘Tomorrow Aaming has an accident.’

In his discussion of Mandarin, Sun (2014) takes such a restriction as evidence for a tensed approach with a NON-FUTURE tense morpheme, which imposes a restriction on temporal reference. We argue that the future restriction can alternatively be explained by a restriction on the applicability of forward EvalT shift: it is available only in narratives and not in free-standing clauses in Cantonese, just like in English. A configuration like (17) is disallowed, where the sentence is evaluated with respect to an EvalT that follows the ST.

(17) **Future:** * forward-shifted EvalT



In other words, there is an asymmetry in the application domain of EvalT shift in Cantonese: while *backward* EvalT shift applies to free-standing clauses, *forward* EvalT shift cannot. It should be noted that forward shift is possible in Cantonese in narratives such as the one in (18). Future reference requires no overt marking in this case, again, just like in English.

(18) A future narrative in Cantonese

Foreteller: Tingjat, Aaming jyusoeng jingoi, zeng-soeng zo-saau.
 Tomorrow Aaming encounter accident make.hurt left-hand
 ‘Tomorrow Aaming has an accident, and hurts his left arm.’
 (The foreteller is reporting a future scenario about Aaming.)

Importantly, Cantonese is not the only language that exhibits such an asymmetry. Pancheva & Zubizarreta (to appear) report a similar asymmetry in Paraguayan Guarani: backward EvalT shift is possible in free-standing clauses, but forward EvalT shift is restricted to narratives. Adding English into the picture, which does not allow EvalT shift in free-standing clauses generally and allows it only in narratives, a

possible typology of the applicability of EvalT shift in free-standing clauses emerges, as illustrated in Table 2. Pancheva & Zubizarreta (to appear) point out that Hausa and Yucatec Mayan might instantiate the hypothetical pattern 1, given that these languages have been reported to allow future reference without prospective markers (Mucha 2013; Bohnemeyer 2009). It remains to be seen whether such an analysis is indeed appropriate for these languages and if so, whether any other language instantiates the hypothetical pattern 2. Part of the complication is that Hausa at least has a prospective marker, much like Cantonese, Paraguayan Guarani and English, so the variation in the possibility of forward EvalT shift cannot be attributed to the presence/absence of such a marker. In the absence of a theory of what drives the restrictions in the first place – the mechanism of EvalT shift should be universally available – it is not possible to make predictions about the cross-linguistic typology.

Language	Backward shift	Forward shift
Cantonese	✓	✗
Paraguayan Guarani	✓	✗
English	✗	✗
Hypothetical language 1	✓	✓
Hypothetical language 2	✗	✓

Table 2 A possible typology of EvalT shift in free-standing clauses

5.4 Summary

We have demonstrated that it is possible to give an account of temporal reference in Cantonese without an appeal to tense. Positing tense offers no advantage in accounting for the fact that sentences with imperfective-marked predicates receive both present and past interpretations, while sentences with perfective-marked predicates are only interpreted as past. Evaluating sentences relative to two EvalTs, rather than just the default ST, captures the temporal flexibility, while an independent, and apparently universal, present-perfective restriction constrains the flexibility. And although the impossibility of future reference without prospective marking appears to support positing a NON-FUTURE tense, or a PRESENT and PAST tense, we have suggested an alternative explanation in terms of a restriction on EvalT shift. We know that in English such restrictions are a fact (even if we do not fully understand the reason for them); relaxing them in the case of backward but not forward EvalT shift accounts for the impossibility of a future interpretation without a prospective marker. The tenseless account is a serious analytic alternative to the tense accounts.

6 Empirical arguments in favor of the tenseless account

In §5 we demonstrated that a compositional analysis of temporal reference in Cantonese that does not posit tense is a viable analytic contender. We now turn to evidence that, in fact, the tenseless account has better empirical coverage in comparison to the tense accounts.

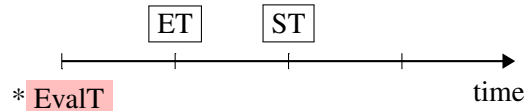
6.1 Future in the past

The first piece of evidence that distinguishes the proposed approach involving EvalT shift from approaches with tense concerns future-in-the-past readings. The argumentation builds on an independently and empirically motivated constraint on EvalT shift (Anand & Toosarvandani 2018; Pancheva & Zubizarreta to appear). Specifically, this is a constraint formulated with respect to an initial EvalT shift, i.e., a shift in the first clause of a narrative in English, which here we extend to free-standing clauses in Cantonese, as in (19).

- (19) A constraint on EvalT shift
 (in a free-standing clause σ or the initial clause σ_1 in a narrative $\sigma_1\sigma_2$)
 EvalT shift in σ/σ_1 may not precede the ET in σ/σ_1 : $t_n \not< ET$.

In effect, this constraint bans the future-in-the-past reading in sentences where evaluation time shift has come into play, schematically illustrated in (20).

- (20) * EvalT < ET, under the constraint in (19)



In languages with tense like English, a future-in-the-past reading is available, contributed by the past tense and the prospective morpheme *woll*.

- (21) John was going to sing yesterday.

However, free-standing clauses in Paraguayan Guarani disallow such a reading, as first noted by Tonhauser (2011), (*-ta* is a prospective marker in the language). Pancheva & Zubizarreta (to appear) argue that the unavailability of the future-in-the-past reading follows from the fact that the language lacks a past tense, and the past reading in (22) is derived via EvalT shift, which is subject to the constraint in (19).

- (22) #Kalo o-purahéi-ta kuehe. Paraguayan Guarani
 Kalo 3-sing-PROSP yesterday
 ‘Kalo was going to sing yesterday.’

The availability of the future-in-the-past reading can be used to diagnose whether EvalT shift is in effect in free-standing clauses in a language. If Cantonese has a non-overt NON-FUTURE or a PAST tense, that tense, in combination with a prospective marker, should derive a future-in-the-past interpretation, similarly to English.

We consider prospective markers like *wui* ‘will’ and *jiu* ‘need’ in Cantonese. The sentences in (23) show that they are incompatible with a (clause-mate) past adverbial, patterning with Paraguayan Guarani and not with English.⁵ The adverbials are not themselves the problem, they restrict the flexible interpretation to past, and in their absence, the sentences are acceptable but only have a present interpretation.

(23) Prospective markers and past time adverbials

- a. #Aaming camjat wui coenggo
Aaming yesterday will sing
Intended: ‘Aaming was going to sing yesterday.’
- b. #po syu camjat zulai jiu lam
CL tree yesterday soon need fall
Intended: ‘The tree was going to fall yesterday.’

Note that the future-in-the-past reading is possible if the prospective markers are (a) in an embedded clause or (b) in a non-initial clause in a narrative. This is because the constraint in (19) concerns free-standing matrix clauses and initial clauses in narratives. Subsequent clauses in narratives involve an update of the shifted EvalT and are subject to a different constraint, in English as well in Paraguayan Guarani (Anand & Toosarvandani 2018; Pancheva & Zubizarreta to appear).

(24) Cases where a future-in-the-past reading is possible

- a. Aaming camjat waa keoi wui coenggo.
Aaming yesterday say he will sing
‘Aaming said yesterday that he would sing (but he didn’t).’
- b. Ngo camjat jindou jat-po daisyu. Batgwo po syu zulai
I yesterday see one-CL big.tree but CL tree soon
jiu lam.
need fall
‘I saw a big tree yesterday. But it was going to fall.’

We take the contrast in (23) and (24) to be evidence for the proposed EvalT shift approach, which is derivable from the independently motivated constraint in (19). Crucially, the contrast is not predicted under approaches that posit tense. Under

⁵ The sentences are compatible with non-past adverbials, such as *tingjat* ‘tomorrow’ and *jigaa* ‘now’. In these cases, there is no EvalT shift.

the null tense approaches (Sun 2014; He 2020), the future-in-the-past reading is predicted to be possible: a NON-FUT or a PAST tense morpheme should be able to co-occur with a prospective marker, as is the case in English. The tense-aspect bundling approach (Lin 2006, 2010) is also silent on the lack of such a reading.

6.2 Backtracking

Anand & Toosarvandani (2018) observe that there is a ban on backtracking, i.e., event reordering, in narratives in the narrative present, in contrast to narratives in the canonical past. Compare the use of past tense in (25a) and narrative present in (25b) in English. With the use of past tense, the falling event can be ordered before or after the pushing event. Put differently, the use of past tense allows re-ordering of the two events in the narrative. However, with the use of narrative present, the falling event must precede the pushing event, i.e., backtracking is disallowed.

(25) Backtracking is disallowed in English *with narrative present*

- a. Max fell. John pushed him. fall < push or push < fall
- b. Max falls. John pushes him. fall < push *only*

Based on these observations, and building on a proposal in Anand & Toosarvandani (2018), Pancheva & Zubizarreta (to appear) argue that updates to a shifted EvalT are subject to the constraint given in (26).

(26) A constraint on EvalT update in narratives $\sigma_1 \sigma_2$

- a. The EvalT in σ_2 may be the ST.
- b. The shifted EvalT in σ_2 may not precede the ET in σ_1 .

Importantly, backtracking is made possible by the presence of past tense. A past RT in the second clause may precede the RT of the first clause, which in turn re-orders the eventualities. However, in the absence of an RT in the second clause (i.e., when there is no tense), and assuming the constraint on EvalT update in (26b), such re-ordering may not happen. Backtracking is thus precluded in the narrative present.

Returning to Cantonese, the narrative in (27) consists of two bare sentences. The only possible reading is one with temporal progression, i.e., a backtracking reading is disallowed, in a way similar to the English narrative in (25b). Note that the adverbial *hai go-go sihau* ‘at the time’ is added to facilitate a narrative reading of these bare sentences, such that they are not two independent sentences.⁶

⁶ In narratives, bare telic predicates can be used without overt aspect. Recall that we posited a null imperfective aspect, (9), restricted to atelic eventualities. We suggest that it is this aspect, which appears in the narrative in (27), with its presupposition suspended, so that it combines with telic predicates. Something similar happens in the case of the simple (i.e., non-progressive) aspect in

- (27) A past narrative in Cantonese
 hai go-go si hau, Aaming lautai. Aafan tui keoi jat-haa.
 at that-CL time Aaming fall.downstairs Aafan push him once
 ‘At that time, Aaming falls. Aafan pushes him once.’
 OK *temporal progression*: fall < push
 ?? *backtracking*: push < fall

The lack of backtracking reading is unexpected if Cantonese were to possess null tense morphemes like NON-FUT or PAST (Sun 2014; He 2020). Such tenses would provide a past RT, and the RT of the second clause could be ordered before the RT of the first clause, effectively reordering the two events. The tense approaches make the wrong predictions. On the other hand, the lack of backtracking follows from the constraint in (26), which prevents the shifted EvalT in the second clause from preceding the first one.

7 Conclusions

We proposed an account without tense that accurately derives temporal reference in matrix clauses in Cantonese. The account involves manipulation of the evaluation time parameter. Present reference is derived when the evaluation time is the speech time, and past reference obtains when the evaluation time is a time that precedes the speech time. We suggested that the mechanism of evaluation time shift (strictly speaking, of bi-contextual evaluation) is universally available, but there are language-specific restrictions on its use. In English the mechanism is restricted to narratives, while in Cantonese this restriction holds only with respect to future reference, and free-standing sentences about past eventualities are evaluated relative to a back-shifted evaluation time. The account has an advantage over accounts with covert tense when it comes to the absence of future-in-the-past readings in free-standing matrix clauses and the absence of backtracking in narratives.

Our proposal about Cantonese opens up the possibility that other languages without overt tense morphology may also lack semantic tense. And particularly notably, it suggests that tense is not a semantic universal.

English, whose meaning is episodic (i.e., non-generic). In combination with present tense, this aspect combines only with stative predicates (e.g., *Marie knows French*); eventives receive a generic interpretation (e.g., *Julia dances*), which means that they do not combine with the episodic simple aspect. Yet in narratives, this aspect combines with eventives: e.g., in (2), *I grab him by the collar* has an episodic interpretation. Finally, it may appear strange that an imperfective aspect would allow sequencing in narratives. Yet this too happens elsewhere. The literature on Slavic aspect has noted that in some of the languages only imperfective aspect may appear in the narrative present (e.g., Dickey 2000), and when it combines with telic predicates, the imperfective enforces sequencing.

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