Let's talk about the future: An investigation of temporal reference in Kaqchikel[1]

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Abstract. This paper provides an analysis of temporal reference in the understudied language, Kaqchikel (Mayan). Building on results from recent studies of temporal reference in languages that lack overt grammatical tense by Matthewson (2006) for St'át'imcets and Tonhauser (2011) for Guaraní as well as the distantly related language Yucatec Maya by Bohnemeyer (1998), I consider both a tensed and tenseless analysis for Kaqchikel. Testing first for whether or not the obligatory aspect/mood markers on finite verbs contribute temporal reference and then testing for the possibility of covert tense, I show that Kaqchikel lacks the non-future temporal restriction present in St'át'imcets and Guaraní. Instead, I argue that Kaqchikel behaves more like Hausa as discussed in Mucha (2013), and ultimately I conclude that Kaqchikel is a tenseless language where temporal reference is determined by context and temporal adverbials.

Keywords: Tense and aspect, tenseless languages, Mayan linguistics.

1. Introduction

The observation that languages vary with respect to how temporal relationships are encoded is not a novel one. Out of this observation has sprung a lively debate about the status of tense in languages that appear to be tenseless, where tense is minimally not an overt morphological marking. One of the central questions in the discussion is whether or not there are truly tenseless languages, where tense is not a grammatical category. For languages to be truly tenseless, the reference time of an utterance is established using other means, such as discourse context and temporal adverbials rather than a grammaticized tense morpheme. However, languages like St'át'imcets (Lillooet Salish), which are at least tenseless on the surface, are observed to have a restriction on future reference times. Matthewson (2006) provides an account of St'át'imcets as a language that is only superficially tenseless with a phonologically empty non-future tense morpheme, TENSE, restricting reference times to non-future time intervals with respect to utterance time. Another language with a similar pattern with a non-future restriction for finite clauses is Paraguayan Guaraní (Tupí Guaraní). Tonhauser (2011) tests both a tensed and tenseless analysis of Guaraní, and ultimately concludes that a tenseless approach for Guaraní is the simpler and thus preferable analysis based on evidence from subordinate clauses and other more complex sentence types.

While both Guaraní and St'át'imcets finite verbs discussed in the two aforementioned studies are unmarked for aspect or mood, the focus of this paper is Kaqchikel (Mayan), a language in which finite verbs are obligatorily marked for aspect or mood. Because all finite clauses are marked for with one of four (tense)-aspect-mood ((T)AM) markers, it shifts the direction of the present study to first considering whether or not any of the (T)AM markers are encoding tem-

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poral reference, and if not, then asking the question as to what, if any, restrictions on temporal reference there are. Ultimately, I conclude that Kaqchikel is best analyzed as a truly tenseless language, which exhibits no restrictions on future reference times, namely for verbs marked with the imperfective aspect.

Following the ideas first formalized in Reichenbach (1947) and further developed by Klein (1994) among others, I assume that temporal relationships in natural language involve three times: the time at which utterance is made (utterance time), the time interval the eventuality is constrained (reference time), and the time that the eventuality takes place (event time). Further, I assume that tense is the relationship between the reference time (RT) and utterance time (UT) and that aspect relates reference time (RT) to event time (ET). Languages that are said to be tensed languages, such as English, encode the relationship between UT and RT grammatically with tense morphology, which is illustrated in (1). In (1a), the verb *play* is marked with the morpheme *-ed*, which encodes the past tense in that the RT is prior to UT (RT < UT) In (1b), the auxiliary verb *be* is inflected for the present tense, and the RT is the same as UT (i.e. RT=UT)

(1) a. I played basketball.
     b. I am playing basketball.

Grammatical tense in English serves to establish the RT with respect to UT, but the RT time interval can be further constrained either in context or using temporal adverbials (e.g. *tomorrow, yesterday, at 8 o'clock tonight*) to a more specific time interval within the past/present/future RT. In (2a) the RT is constrained to a past RT and further to a time interval coinciding with the day prior to UT, which is established by use of *yesterday* in Speaker A's question. In (2b), the time interval introduced by *last week* constrains the basketball playing event to the time interval that coincides with the week prior to UT.

(2) a. A. What did you do yesterday?
         B. I played basketball.
     b. I played basketball last week.

While tense deals with the relationship between RT and UT, aspect deals with the relationship between RT and ET. For example, the perfective aspect situates ET inside the time interval established by RT (ET ⊆ RT). However, the perfect aspect situates ET before RT (ET < RT). In 3a, RT is established as a past time that occurred the day before UT as denoted by the adverbial *yesterday*, and further the event of basketball watching was completed within that RT. For (3b), the perfect construction using the auxiliary *have* marked for past tense tells us that the the RT is before UT (past tense) and further the RT is the time interval at which the speaker arrives at the party. The perfect aspect marked on the main verb with the past participle *–en* tells us that ET is before RT. That is, the 'eating' event takes place prior to the 'arriving' event.

(3) a. Yesterday, I watched the basketball game.
     b. When I arrived at the party, I had already eaten.

In English, the temporal adverbials and contextual information serve to provide additional information about the reference time, but for languages that lack overt tense morphology, the reference time is only established in the discourse context or using temporal adverbials. In (4a) for Kaqchikel, an utterance marked with the imperfective aspect is underspecified for temporal reference, so any of the three given translations are possible. However, for (4b), the reference time is established by the presence of the temporal adverbial *iwïr pa tiqaq'ij* 'yesterday in the afternoon'.

(4)   a.   y-i-wär
           IMPF-B1S-sleep
           'I was sleeping/am sleeping/will be sleeping.'
      b.   y-i-wär   iwïr   pa tiqaq'ij
           IMPF-B1S-sleep yesterday PRE afternoon
           'I was sleeping yesterday in the afternoon.'

Unlike the Kaqchikel data in (4a), St'át'imcets finite clauses, which are only marked for person/number agreement, are restricted to non-future reference times. In (5), (5a) shows that both a past and present reference time is available, which is suggestive of a tenseless clause. However, (5b) is unacceptable when combined with a future denoting adverbial suggesting that perhaps a covert non-future tense is responsible for the reference time restriction. Matthewson (2006) refers to such utterances as superficially tenseless sentences, or STSs. In (5), the STS is only felicitous when the interpretation is a non-future reference time, as indicated in the contrast between (5a) and (5b), which appears with future denoting temporal adverbials. The example in (5c) illustrates that the utterance can combine with non-future denoting adverbials.

(5)   a.   sáy'ez'-lhkan
           play-1SG.SUBJ
           'I played/I am playing'   (Matthewson, 2006: p. 676)
      b.   *sáy'ez'-lhkan natcs/zánucwem
           play-1SG.SUBJ one.day.away/next year
           Intended: 'I will play tomorrow/next year.'   (Matthewson, 2006: p. 677)
      c.   sáy'ez'-lhkan   i-tsilkstásq'et-as
           play-1SG.SUBJ when.PAST-Friday-3CONJ
           'I played on Friday.'   (Matthewson, 2006: p. 677)

Matthewson (2006) proposes that the non-future temporal restriction is due to a phonologically empty tense morpheme TENSE. Further, she claims that any future-oriented utterances must receive overt marking, and the future interpretation is akin to the WOLL analysis for English *will* and *would* as proposed in Abusch (1985), where each form is composed of WOLL, a future-shifting operator, plus tense. Under this analysis, the prediction is that a language only allows future readings when overt morphology is present. In (6), Matthewson analyzes *kelh* as the overt spellout of WOLL in St'át'imcets, which is underlyingly the non-future TENSE plus the future-shifting operator.

(6) sáy'ez'-lhkan kelh
     play-1SG.SUBJ *kelh*

     'I will play.'   (Matthewson, 2006: p. 677)

In a separate study on Guaraní, Tonhauser (2011) observes that the data is similar to St'át'imcets in that matrix clauses only marked for person/number agreement (i.e. superficially tenseless) have the same non-future restriction, which warrants consideration of a covert tense analysis as well. However, on the assumption that the non-future covert tense morpheme must be present in all matrix clauses, the tensed analysis for Guaraní leads to problems accounting for the behavior of some subordinate tenseless clauses and for non-initial matrix clause conjuncts, which do actually license future reference times. To make a tensed analysis work, certain stipulations would be necessary to account for these cases. Thus, a tenseless analysis of Guaraní is a simpler approach and accounts for the various problematic cases for the tensed approach making it the preferred analysis for Tonhauser.

Data from other languages including Kalaallisut (Bittner, 2005), Chinese (Smith and Erbaugh, 2005; Lin, 2006), and Hausa (Mucha, 2013), among others, have also contributed to the discussion on the status of tense in languages that lack overt tense morphology. The primary focus of this paper is to add to the discussion with an analysis of the Kaqchikel temporal system and address the open question as to whether or not tense is encoded in the language. Although Kaqchikel differs from both St'át'imcets and Guaraní in that finite verbs are never unmarked for aspect or mood, the data leads to the conclusion that Kaqchikel is best analyzed as a tenseless language. Further, the non-future temporal restriction in clauses only marked for aspect or mood does not apply to Kaqchikel as with both St'át'imcets and Guaraní, which strengthens the argument for a tenseless analysis. In order to motivate this conclusion, I provide a description of Kaqchikel aspect and mood in §2. §3 discusses both a tensed and a tenseless approach for Kaqchikel finite matrix clauses, and §4 considers reference times of subordinate clauses. I conclude in §5.

2. Introduction to (T)AM in Kaqchikel

Turning now to Kaqchikel, the first important difference, as already mentioned, is that unlike both St'át'imcets and Guaraní, all finite verbs are obligatorily marked with one of four (tense)-aspect-mood ((T)AM) markers, which are given in Table 1.

Morpheme	Function
n-/y-/nk-	Imperfective aspect
x-	Perfective
xt-/xk-	Potential mood
t-/k-	Imperative/hortative mood

Table 1: (T)AM morphemes and functions

In addition to being inflected for (T)AM, verbs are marked for person/number agreement. The basic verbal template for Kaqchikel is given in (7), where Set A refers to the ergative agree-

ment markers and Set B refers to the absolute agreement markers. Kaqchikel displays an ergative/absolutive alignment where intransitive subject arguments are marked the same as transitive objects (Set B) and the subjects of transitive arguments are marked with a different set of agreement markers (Set A). Examples for fully inflected verbs for the imperfective and perfective aspect are given respectively in (8a–8c). Both (8a) and (8b) are intransitive, so only Set B markers are used for agreement, but (8c) shows use of a transitive verb marked with both the Set A and Set B markers.

(7)   (T)AM-SETB-SETA-verb-(optional suffixes)

(8)   a.   y-in-atin
           IMPF-B1S-bathe
           'I was/am/will be bathing.'
      b.   x-in-atin
           PRFV-B1S-bathe
           'I bathed.'[2]
      c.   y-at-in-tz'ët
           IMPF-B2S-A1S-see
           'I see you.'

In addition to the frequently used imperfective and perfective aspects, the potential and hortative/imperative moods are also available to fill the (T)AM slot, which are exemplified in (9a–9c) respectively. Note that (9b) is a regular second person singular imperative, but (9b) is in the third person singular and shows the hortative use of the marker.

(9)   a.   xk-i-wär
           POT-B1S-sleep
           'I will sleep.'
      b.   k-a-pa-e'
           IMP-B2S-stand-ITV
           Stand!
      c.   t-u-mestaj
           IMP-B3S-forget
           'May he forget.'

For the present study, I focus only on the perfective, imperfective and potential markers. In the next section, both a tensed and tenseless analysis of the morphemes and of the finite clauses in which they appear are considered.

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[2]The non-past interpretation of the perfective utterance is judged to be infelicitous to native speakers. However, a non-past reading is possible when enough context is added, which is discussed further in §3.2.

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3. Status of 'tense' in Kaqchikel

In this section, I consider both a tensed and tenseless analysis for finite verbs in Kaqchikel. Previous descriptions of (T)AM in Kaqchikel vary on this point. Rodríguez Guaján and García Matzar (1997) analyze the language as tenseless, but only the imperfective is shown as being compatible with various RTs. Brown et al. (2006), although pedagogical, refers to the imperfective also as a present tense, the perfective as a past tense, and the potential as a future tense. Because of the lack of consensus and lack of evidence to support a tenseless analysis, each morpheme is potentially responsible for introducing grammatical tense. Further, the possibility that covert tense is responsible for introducing the RT remains in the instance that the aspect/mood markers are shown to not encode tense. To discern between a tensed or tenseless analysis of Kaqchikel there are three hypotheses to test here:

1. The aspect/mood morphemes are also encoding tense, so there is no covert tense present because tense is overtly indicated by the aspect and mood markers in addition to aspect/mood information.

2. The aspect/mood morphemes are not encoding tense and only aspect/mood information. Tense is thus a covert morpheme restricting reference times. Additionally, to get future interpretations, special morphology must be used.

3. There is no covert or overt tense restricting reference times in Kaqchikel. Reference time is supplied only by temporal adverbials and in the discourse context.

For each hypothesis above, I provide tests for each morpheme to determine the status of tense.

3.1. Hypothesis 1: *Kaqchikel TAM morphemes encode aspect/mood+tense*

To test for the first hypothesis, I evaluate whether or not any of the three aspect/mood markers are restricted to only one reference time interval, which includes consideration of a past/present distinction or the non-future only distinction. If any of the morphemes encodes grammatical tense, the expectation is that they will be incompatible with temporal adverbials denoting various RTs with respect to utterance time. A further test that I employ in this section considers temporal adverbials that are ambiguous with respect to RT, which is exemplified in (10) with *at 6 o'clock in the morning*, where the tense in English restricts the interpretation of the adverbial as a past/present/future RT. In (10a), the past tense restricts the time interval to a past RT, so the temporal adverbial denotes a past time that coincides with 6 o'clock in the morning. However, (10b) refers to a future 6 o'clock in the morning with respect to UT.

(10)   a. I woke up at 6 o'clock in the morning.
         b. I will wake up at 6 o'clock in the morning.

If an underspecified temporal adverbial remains underspecified (setting aside interpretation preferences for the moment) with any of the aspect/mood morphemes in Kaqchikel, it suggests

that tense is not being encoded by a given aspect/mood marker as is the case for English in (10).

Starting with the imperfective, we already saw that past/present/future RTs are available, as exhibited by (8a), which already points in the direction of a tenseless analysis of at least the imperfective aspect. To further support this claim, (11) shows that matrix clause verbs marked with the imperfective aspect are compatible with past (11a), present (11b) and future (11c) denoting temporal adverbials. Just a brief note that although the imperfective alone can be used for the progressive meaning, use of the periphrastic progressive with the auxiliary *tajin* is preferred by the speakers I work with to distinguish between the progressive and other imperfective meanings, which is shown by the non-progressive habitual interpretation shown in (12). However, the temporal reference restrictions are unaffected by use of the periphrastic form over the imperfective (i.e. RT is still underspecified and future RTs are possible). In some dialects, the progressive auxiliary is also marked with the imperfective aspect, but in the Sololá dialect only the unmarked *tajin* is used.

(11) a. Iwïr   tajin y-e-xajon
          yesterday PROG IMPF-B3P-dance
          'Yesterday, they were dancing.'   (RT<UT)

      b. Wakamï   tajin y-e-xajon
          now/today PROG IMPF-B3P-dance
          'They are dancing now.'   (RT=UT)

      c. Chwaq   tajin y-e-xajon
          tomorrow PROG IMPF-B3P-dance
          'Tomorrow, they are dancing.'   (RT>UT)

(12) q'ij q'ij y-in-atin
      day day IMPF-B1S-bathe
      'I bathe daily.'

Looking at the second test using underspecified temporal adverbials, I return to the example given in (11b) with the temporal adverb *wakamï*, which can either be used to mean 'now' or 'today'. The same utterance can be translated as *Today, I was dancing/Now, I am dancing/Today, I will be dancing*. In order to establish whether the utterance is to be interpreted as past, present, or future, additional context is necessary. In a context where the RT is established as a future RT, (13) is no longer ambiguous between 'today/now' interpretations and further the non-future interpretations are no longer available.

(13) [Context: What will you be doing later when I get home from work?]
      tajin y-i-xajon   wakamï
      PROG IMPF-B1S-dance now/today
      'I will be dancing today/#I am dancing now.'

Given that the imperfective aspect is compatible with any RT and is insufficient for determining

the RT of underspecified temporal adverbials, the evidence strongly supports an analysis of the imperfective marker not marking tense.

The perfective aspect is less freely shifted into different reference times. In out of the blue contexts, speakers find non-past interpretations to be infelicitous.

(14) x-i-jote'   ch-u-wi   jun juyu
      PRFV-B1S-ascend PRE-A3S-RN one mountain
      'I climbed a mountain/#I will have climbed a mountain.'

Further, it is not possible to use non-past denoting temporal adverbials with the perfective aspect, which is shown in (15b). For (15a), the adverb *iwïr* is felicitous, but speakers judge use of the adverb *chwaq* 'tomorrow' to be bad in (15b) and tend to offer the explanation that use of *x-* must be in the past.

(15)   a. Iwïr,   x-i-jote'   ch-u-wi   jun juyu
           yesterday PRFV-B1S-ascend PRE-A3S-RN one mountain
           'Yesterday, I climbed a mountain.'

       b. '#Chwaq x-i-jote'   ch-u-wi   jun juyu
           tomorrow PRFV-B1S-ascend PRE-A3S-RN one mountain
           Intended: 'Tomorrow, I will have climbed a mountain.'

Underspecified temporal adverbials are also interpreted as past denoting when used with the perfective aspect. Taking the adverbial *wakamï* again, the future interpretation as an event occurring sometime later that day is not possible.

(16)   [Context: When is your mother coming to visit?]
       x-ø-pï   wakamï.
       PRFV-B3S-arrive now/today
       'She arrived today/#She will have arrived (by) today.'

Both (15a) and (15b) point in the direction of analyzing the perfective aspect as also being restricted to past reference times and thus encoding a past tense. However, as Tonhauser (2011) points out, more complex utterances need to be considered before reaching a conclusion or at least richer contexts which allow for the past RT interpretations to be overridden. In fact, combining both a richer context and a future denoting temporal adverbial allows for non-past reference time for the perfective aspect. In (17), the context establishes that the party under discussion is at a future time. The temporal adverbial is underspecified as to whether 8 o'clock is before or after utterance time, but in the given context it can only be interpreted as a future 8 o'clock, which constrains the RT of the entire utterance to a future time interval.

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(17) [Context: You and a friend are planning a party for 9 o'clock that night. Your mother
is baking the cake for the party, and your friend is worried that she won't be there with
the cake in time. You tell her:]
Pa taq a   las   8   chaq'a wakamï, x-ø-pï   yan
PRE when PRE(Sp) DET(Sp) eight night   now/today PRFV-B3S-arrive PAR
nu-te'
A1S-mother
'By 8 o'clock tonight, my mother will have already arrived.'

In spite of the fact that non-past interpretations do not easily arise with the perfective aspect,
examples like (17) exclude the possibility of an analysis of the perfective aspect as an absolute
past tense in Kaqchikel.

Similarly, the reference time for the potential mood is not easily shifted to times other than the
future. In absence of additional context or a temporal adverbial, utterances with the potential
mood are always interpreted with future reference times, so for (18) only the future interpreta-
tion is available.

(18) xk-i-b'iyin   pa ri tienda
POT-B1S-walk PRE DET store(Sp)
'I'll walk to the store/#I was going to walk to the store.'

Temporal adverbials are also restricted with the potential mood, where only future denoting
adverbials are felicitous, such as *chwaq* 'tomorrow' but not *iwïr* 'yesterday'

(19) xk-i-b'iyin   pa ri tienda   chwaq/iwïr
POT-B1S-walk PRE DET store(Sp) tomorrow
'I'll walk to the store tomorrow/#yesterday.'

When combined with the temporal adverbial *wakamï* 'today/now', again only a future inter-
pretation is found to be available to speakers. In (20), the context establishes that the speaker
is referring to a time prior to UT, which should allow the interpretation of the 'earlier today'
reading and not just the 'later today' reading. However, the context is not sufficient for shifting
the reference time of the utterance nor the interpretation of *wakamï* to a past interpretation. The
response in (20) can only be interpreted as the 'I will go to the store today.'

(20) [Context: You are asked if you've already been to the store to get groceries for the
week. You respond:]
xk-i-b'iyin   pa ri tienda   wakamï
POT-B1S-walk PRE DET store(Sp) now/today
Intended: 'I was going to go to the store (earlier) today.'

Just as with the perfective aspect, the data up to this point suggest that the potential mood is
restricted to future reference times. However, the following examples show that the potential
mood can be used when a past reference time is established in complex utterances. The first ex-

ample is taken from *Ri Kitzijon kan ri Qati't Qamama'*, a children's book containing traditional folk narratives. The first line in (21a) establishes that this is a story that takes place during a past time interval. In (21b), the verb marked with the potential mood is in the subordinate relative clause under the belief-predicate *nojij* 'to think/believe'. The time at which they believed they would be eaten by the jaguar is established as a time that follows the time the animal roars but precedes the time at which they see the cat fighting the jaguar in (21c). In this example, the potential is not interpreted as an absolute future reference time.

(21) a. K'o   cha' jun q'ij x-ka-k'axaj   jun chikop n-ø-sik'in   chunaqaj ri
          EXST QUOT one day PRFV-B3P-hear one animal IMPF-B3S-call near   DET
          ko-choch.
          A3P-house
          'One day they heard the roar of an animal near their houses.'

      b. Janila' x-ø-ki-xib'ij   ki' r-uma x-ki-nojij   che ri   chiköp
          very   PRFV-B3S-A3P-scare 3P B3S-RN PRFV-B3P-think REL DET animal
          xk-e-ru-tïj
          POT-B3P-A3S-eat
          'They were frightened because they thought the animal was going to eat them.'

      c. Xa ja k'a ri ti ki-me's x-u-pab'a'   ri ch-u-wäch   jun
          PAR FOC PAR DET DIM 3P-cat PRFV-B3S-stand.up DET PRE-B3S-face one
          b'alam.
          jaguar
          'But it was their cat that stood up in the face of the jaguar.'

The second example of a potential mood in a non-future reference time contains the phrase *ri' ojer* 'the past' in the same clause as the verb marked with the potential, which is clearly establishing a non-future reference time for the clause and further for the entire utterance.

(22) kan xk-a-ch'oj-in   ri' ojer, ma jun tä ri' kuy-un-ïk
      INTS POT-B2S-demand-AP DET past NEG one IRR DET forgive-AP-INF
      'In the past, even if you demanded it, there was no forgiveness.' (González, 2016: 35)

Both (21) and in (22) provide strong evidence that the potential mood is also not contributing temporal reference and should be analyzed as only a mood marker.

Summarizing the findings for hypothesis 1, there is sufficient evidence to conclude that none of the three markers is contributing temporal reference, so at this point Kaqchikel looks to be a tenseless language unless testing hypothesis 2, a cover tense analysis, reveals restrictions on reference times for clauses marked for aspect/mood.

3.2. Hypothesis 2: *Kaqchikel has covert tense*

Hypothesis 1 and hypothesis 2 are closely related and the data from the previous section already suggests that a covert tense analysis is unlikely for Kaqchikel. A covert tense analysis relies on temporal restrictions for clauses not overtly marked for tense, so underlyingly all finite clauses are assumed to be marked with a phonologically empty tense morpheme, TENSE. For both Guaraní and St'át'imcets, the temporal restriction is to non-future times, but additional covert temporal restrictions are possible (e.g. a covert past tense). Under the assumption that covert tense is restricting reference times, finite matrix clauses are predicted to be only interpreted with restricted temporal reference. However, we already saw that this is not the case for Kaqchikel. Namely for finite matrix clauses marked with imperfective aspect and the potential mood, temporal reference is not restricted to any specific RTs. Focusing on the restrictions observed in other languages on future reference times, the examples in (23) and (24) demonstrate that both past and future temporal reference are available if a salient RT is established. If a future RT is established in context or by a temporal adverbial, future interpretations are available for Kaqchikel. For (23), the context preceding the target utterance marked with the imperfective aspect introduces a salient reference time that restricts the RT of the response to past RTs. However, in (24), the context introduces an RT, which is in the absolute future of UT.

(23)   [Context: You called your friend earlier that morning, but she didn't answer. You see her later and ask what she was doing that morning:]
(tajin)   y-in-samäj
(PROG)   IMPF-B1S-work
'I was working.'

(24)   [Context: Your friend wants to get dinner later that evening. You are unable to attend, so she asks what you will be doing instead. You respond:]
(tajin)   y-in-samäj
(PROG)   IMPF-B1S-work
'I will be working.'

Given that matrix clauses in Kaqchikel are not restricted to non-future RTs, there is no evidence that a phonologically empty non-future tense morpheme is restricting the temporal reference of an utterance. Rather, Kaqchikel temporal reference is established in the discourse context or with temporal adverbials. However, this does leave open the question as to how temporal reference is established in out-of-the-blue contexts, but I reserve further discussion for §4.

In addition to the implications for past and present RTs, the covert tense analysis has implications for how to analyze future discourse in languages that are (at least) superficially tenseless like St'át'imcets. Matthewson (2006) argues that there is no absolute future tense category and future discourse is realized by the combination of tense (covert or overt) and a prospective aspect. The prospective aspect acts as a future-orienting operator that shifts the ET to a future time of the RT rather than the UT. This accounts absolute future interpretations in which the RT is at UT, so the ET is shifted to a time that temporally follows RT (RT<ET, RT=UT). It also accounts for future of the past interpretations, where the reference time is established a past RT

and ET temporally follows RT (RT<ET, RT<UT) giving rise to ETs that can still be in the past with respect to UT or after as exemplified for English in (25).

(25) a. A child was born who will become ruler of the world.
      b. A child was born who would become ruler of the world.   (Kamp, 1971)

An additional feature of the covert tense analysis is the proposal that special morphology or marking is required in order to get future interpretations, such as *kelh* in St'át'imcets. Recall that clauses for St'át'imcets cannot be interpreted as having absolute future reference times. Rather, the marker *kelh* situates the event time of the utterance to a time that temporally follows the reference time (RT<ET). If an utterance is interpreted with a future reference time for an event, this is due to the combination of TENSE restricting the reference times to non-future times plus *kelh*, which is shown in the contrast between (26) and (27) both repeated here for convenience. For (26), the reference time is restricted to either a past or a present time interval, but when *kelh* is used in (27), the playing event is shifted to a time after RT. In this case, the RT is the same as UT, so the absolute future interpretation is expected.

(26) sáy'ez'-lhkan
      play-1SG.SUBJ
      'I played/I am playing.'   (Matthewson, 2006: p. 676)

(27) sáy'ez'-lhkan   kelh
      play-1SG.SUBJ *kelh*
      'I will play.'   (Matthewson, 2006: p. 677)

Data from St'át'imcets (in Matthewson, 2006), Guaraní (in Tonhauser, 2011), and Hausa (in Mucha, 2013) all provide cross-linguistic evidence that (at least some) instances of future reference times do require special morphology (prospective aspect). However, according to Mucha (2013) Hausa allows for future interpretations for clauses marked with the continuous aspect, which is shown in (28).

(28) Su-àn   wàsà
      3PL-CONT play
      'They are playing/(were playing)/(will play)'   (Mucha, 2013: p. 372)

Again, the Hausa data looks quite similar to the Kaqchikel data from (24), where no additional morphology is required for the utterance to be interpreted with an absolute future RT. Because neither components of the covert tense analysis apply to the Kaqchikel data, the remaining hypothesis, that Kaqchikel is a truly tenseless language, is likely to be the preferred analysis.

3.3. Hypothesis 3: *Kaqchikel is tenseless*

To summarize the results of testing for hypothesis 1 and hypothesis 2, we already saw that hypothesis 1 (*Kaqchikel TAM morphemes contribute aspect/mood+tense*) is ruled out because

each of the aspect/mood morphemes lacks any restrictions for temporal reference ignoring restrictions due to pragmatic principles, which will be discussed in the next section. Hypothesis 2 was then ruled out because finite matrix clauses in Kaqchikel are not restricted to non-future reference times nor are any other reference time restrictions (i.e. a non-past restriction) present in the data. Further, future temporal reference is available for utterances that are otherwise unmarked for a prospective aspect (in the sense Matthewson's future-shifting operator). Discourse context and temporal adverbials are sufficient for giving rise to future RTs. This leaves open the question as to whether or not hypothesis 3 that Kaqchikel is tenseless is, indeed, the most suitable analysis of Kaqchikel. Evidence that no overt or covert morphological marking in the language restricting the reference time in a given utterance (or finite clause) has already been discussed. Instead of rehashing these points, I turn to additional evidence that comes from future discourse in the language.

To realize future discourse in Kaqchikel, more than one option is potentially available. Tonhauser (2011) refers to the two possible options for how languages realize future discourse as the *reference time option* and the *eventuality time option*. The ideas are developed from a similar analysis of how eventualities are situated with respect to utterance time in more than one way (Reichenbach, 1947). Tonhauser (2011) appeals to the two possible options in order to discuss how an eventuality can be situated in the absolute future of UT. If future discourse is realized by the reference time option, there must be a salient reference time in the absolute future, and the ET is then situated as occurring in the absolute future of the UT. On the other hand, the eventuality time option assumes that all utterances have a past or present RT, and future discourse is realized by situating the ET at a time that temporally follows the RT. Tonhauser (2011) analyzes Guaraní as a language that relies on the eventuality time option, whereas English *will* constructions are an example of the reference time option.[3] I analyze Kaqchikel as a language that uses both the eventuality time option and the reference time option (with restrictions).

Because I analyzed Kaqchikel as a tenseless language, it may seem as though the reference time option for future discourse is ruled absence of grammatical tense. However, in principle it should still be available so long as there is a means for indicating absolute future temporal reference in the language. In (29), the temporal adverbial *chwaq* 'tomorrow' introduces an absolute future reference time because the speaker is talking about the day in the absolute future of utterance time. Note that the verb is marked with the imperfective aspect, which we already know is the only aspect marker easily shifted into different reference times using only a temporal adverbial or in context.

(29) Chwaq   y-i-jote'   ch-u-wi   jun juyu
      tomorrow IMPF-B1S-ascend PRE-A3S-RN one mountain

      'Tomorrow, I'll climb a mountain.'   (UT<RT⊇ET)

The eventuality time option is also available for the imperfective aspect. In (30), the temporal adverbial *iwir* 'yesterday' restricts the RT of the utterance to the past. However, the temporal

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[3]This is on the assumption that English *will* introduces an absolute future reference time in contrast to the WOLL analysis given in Abusch (1985). This also contrasts to the 'eventuality time' option in English with the *is/are going to* construction, which has a present tense RT and the ET temporally follows the RT.

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adverbial *chaq'a wakamï* 'tonight' situates the ET after RT, which is also located in the absolute future of UT.

(30) Iwïr,   Maria x-i-ru-b'ij   chï n-ø-pe   chaq'a wakamï
     yesterday Maria PRFV-B1S-A3S-tell REL IMPF-B3S-come night   today/now
     Yesterday, Maria told me that she is coming tonight.'

The perfective aspect, though difficult to shift to non-past RTs, can also realize future discourse with the reference time option. The earlier example of the perfective aspect shifted to a future RT (17) (partially repeated here for convenience) relies on the temporal adverbial *pa taq a las 8 chaq'a wakamï* 'By 8 o'clock tonight' constrains the RT of the utterance to a future time. The RT is in the absolute future of the UT, and the event of the mother's arrival, or the ET, is a completed event at or before RT.

(31) Pa taq a   las   8   chaq'a wakamï, x-ø-pï   yan
     PRE when PRE(Sp) DET(Sp) eight night   now/today PRFV-B3S-arrive PAR
     nu-te'
     A1S-mother
     'By 8 o'clock tonight, my mother will have already arrived.'   (UT<RT⊆ET)

Future discourse can also be realized using the eventuality time option for the perfective as well, but it also achieved with similar difficulty as the reference time option. However, the example in (32) is constrained to a past RT by the temporal adverbial *iwïr* 'yesterday'. The first event in the utterance is the saying event, which also occurs at a past time, but the temporal interpretation of the second clause containing the event of finishing the work is temporally located in the absolute future.

(32) Iwïr,   Maria x-i-ru-b'ij   chï x-ø-ru-k'is   ru-samaj chaq'a
     yesterday Maria PRFV-B1S-A3S-tell REL PRFV-B3S-A3S-finish A3S-work night
     wakamï
     today/now
     'Yesterday, Maria told me that she will have finished her work by tonight.'

Finally, the potential mood is the only marker that I argue is restricted to the eventuality time option for future discourse. If the potential were actually a future marker, then all utterances could be interpreted as taking place in the absolute future. A further consideration is the difference between speaker choice for when to use the imperfective or the potential to describe incomplete events, such as the contrast in (33). In (33a), the imperfective aspect is used to describe the event of walking to the store at a future time. For (33b), the potential mood is used. Speaker intuitions about the difference in these examples is that the imperfective is used when there is more certainty that the event will occur, while the potential mood introduces more uncertainty of the realization of the event.

(33) a. y-i-b'iyin   pa ri tienda chwaq
     IMPF-B1S-walk PRE DET store(Sp) tomorrow
     'I will walk to the store tomorrow.'

    b. xk-i-b'iyin   pa ri tienda chwaq
     POT-B1S-walk PRE DET store(Sp) tomorrow
     'I'll (potentially) walk to the store tomorrow.'

I argue that the RT of (33a) is a future RT (UT<RT), but the RT in (33b) is the time of utterance (UT=RT). The event description of walking to the store takes place at a time interval in the absolute future of UT, but the potential for the event to take place is only at the time the sentence is uttered. A further example of the potential mood in future discourse is given in (34). The example comes from one of the folk stories in *Ri Kitzijon kan ri Qati' Qamama'*. Prior to this in the story, a group of animals is approaching a woodpecker to ask for a favor. They need a hole drilled in a stone in order to reach food. The response of the woodpecker is in (34). Although the narrative itself takes place in the past, the clauses of concern are those embedded under *–b'ij* 'to say/tell'. He offers them a deal that in exchange for the favor they ask, he wants a dress (costume) that they have. The RT for the speech act introducing the wish or request by the woodpecker is the time he utters it, but the events described are in the absolute future of UT.

(34) X-u-b'ij   chi-ke chï xt-u-k'öt ri abäj we xti-ki-sipaj   yan
   PRFV-A3S-tell RN-3P REL POT-A3S-drill DET stone REL POT-A3P-give.a.gift PAR
   tzyäq chi-re.
   dress RN-3S
   'He [the woodpecker]told them he will drill the hole in the stone if they give him the dress.'

4. Interpretational preferences

For the remainder of the paper, I address the question introduced earlier in the paper about why different aspect/mood markers have interpretational preferences in out-of-the-blue-contexts or in underspecified contexts. For instance, all three markers discussed here have interpretational preferences, of which some are stronger than others (i.e. less easy to override with context). The imperfective tends to be interpreted with present temporal reference, the perfective with the past RT, and the potential with the future. In order to account for these preferences that arise in Kaqchikel, I turn to a pragmatic approach as discussed in Smith et al. (2003), Smith and Erbaugh (2005) and Smith et al. (2007) but also related to approaches developed in Bohnemeyer (1998) for Yucatec Maya and Mucha (2013) for Hausa.

The first principle deals with the deictic nature of speech, which is simply that events are described in a deictic relationship to speech time. When interpretational preferences arise, they are always situated with respect to UT. Additionally, the structure of the event described (telic/atelic, stative, etc.) affects the 'default' interpretation. The following are the observed deictic patterns for preferred interpretations as given in Smith and Erbaugh (2005).

1. Ongoing events are in the present

2. States (unbounded) are in the present

3. Bounded events are in the past

4. Explicit temporal reference may override [any of the above] (Smith and Erbaugh, 2005: p. 715)

The deictic principles offer a preliminary view of how eventualities are situated with respect to utterance time, but it stops short of explaining why, for example, bounded events are interpreted in the past and why some interpretational preferences are more difficult to override.

First, bounded events are events that are completed (though whether the boundedness includes both the initial point and terminal point is language dependent), and generally, completed events occur prior to utterance time. When shifting a bounded event to a future temporal interval, the event is still considered a completed within the time interval. Because bounded events must be completed within the time interval denoted by the RT, bounded events are not compatible with a present reference time. For Kaqchikel, this explains the restriction for the perfective aspect to past and sometimes future time intervals. Smith and Erbaugh (2005) refer to this as the *bounded event constraint*. The bounded event constraint is simply that bounded events are not located in the present.

The final pragmatic principle of relevance is the *simplicity principle of interpretation*. This principle simply states 'choose the interpretation that requires the least additional information' (Smith and Erbaugh, 2005: p. 717). Under this principle, we can account for why perfective, or bounded, events in Kaqchikel are more easily interpreted at past RTs and require a much richer context in order to shift the RT to the future as does a shift from a future interpretation to a past interpretation for the potential mood.

By considering pragmatic principles when trying to understand temporal reference in a language like Kaqchikel, it allows for a much simpler analysis as a tenseless language. It predicts that, although interpretational preferences arise due to the structure of the event described in an utterance, these preferences are due to pragmatics and not by underlying semantic machinery, such as covert tense. While a tensed analysis works for languages like St'át'imcets, it fails to account for the patterns in Kaqchikel. To analyze Kaqchikel as a tenseless language, in which temporal reference is established in context, with temporal adverbials, or via interpretational preferences driven by pragmatic principles, is thus the preferred analysis.

5. Conclusion

In summary, this paper provides an analysis of Kaqchikel temporal reference by showing that neither overt or covert tense is present in the language. Ultimately, temporal reference in utterances is interpreted using alternative means. The results of the present study contribute data from a new language to add to a growing typology of how temporal reference is established

cross-linguistically. Additionally, this work sets the stage for future research evaluating other aspects of Kaqchikel that contribute to temporality, such as temporal particles and information structure.

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