

Reanalyzing K'iche' as a Tensed Language

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Abstract

Mayan languages have been claimed to lack the category Tense. Temporal interpretation is instead said to be guided by grammatical Aspect (see e.g. Larsen 1988 for K'iche', Vázquez Álvarez 2002 for Chol, Bohnemeyer 2002 for Yucatec Maya, Coon 2016 for an overview, a.o.). In this paper, I examine the distribution and interpretation of the Tense/Aspect markers *x-* and *k-* in K'iche', traditionally said to mark perfective (completive) and imperfective (incompletive) Aspect, respectively. I consider the co-occurrence possibilities of these markers with temporal adverbials (including temporal clauses), aspectual adverbials ('in/for an hour'), the adverb *na* 'still', and individual level predicates. The evidence converges on the conclusion that the K'iche' prefixes *x-* and *k-* mark (past and non-past) Tense rather than Aspect. The analysis is also shown to make the correct predictions for temporal matching in embedded clauses. Finally, I consider some uses of *k-* in past contexts and conclude that they are best seen as instances of the narrative present.*

Keywords: Tense; Aspect; temporal interpretation; K'iche'; Mayan

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1. Introduction

Mayan languages have been claimed to lack the category Tense. Temporal interpretation is instead said to be guided by grammatical Aspect (see e.g. Larsen 1988 for K'iche', Vázquez Álvarez 2002 for Chol, Bohnemeyer 2002 for Yucatec Maya, Coon 2016 for an overview, a.o.). In this paper, I contribute to the discussion of how temporal information is encoded in Mayan languages by examining the distribution and interpretation of the Tense/Aspect (TA) markers *x-* and *k-* in K'iche' (1).¹ I conclude that, in K'iche', these affixes mark (past and non-past) Tense rather than grammatical Aspect.

(1) a. X-in-b'in-ik.

TA1-B1SG-walk-SS

'I walked.'

b. K-in-b'in-ik.

TA2-B1SG-walk-SS

'I am walking.'

The paper is organized as follows. Section 2 gives a theoretical overview of the categories Tense and Aspect in the Reichenbachian framework (Reichenbach 1947). Having done this, I spell out two main predictions that follow from said framework, which we can use to determine whether we are manipulating Tense or Aspect information. They are: (i) Aspect, but not Tense, can orient itself with respect to a reference time that is not the speech time, and (ii) past Tense, but not perfective Aspect, is compatible with the (likes of the) adverb *still*. In this section, I also briefly discuss the literature on tenseless languages, and how K'iche' fits into the overall picture. Section 3 contains a brief overview of K'iche' morpho-syntax, as well as a discussion of previous work on Mayan that has motivated the view that these languages lack Tense. In section 4, I test the predictions from section 2 and show that the K'iche' prefixes *x-* and *k-* behave like exponents of past and non-past Tense, respectively, rather than as exponents of grammatical aspect. I also consider two additional diagnostics that do not follow directly from the Reichenbachian theory of Tense/Aspect, but that nevertheless represent robust cross-linguistics tendencies, namely compatibility with the adverbials *in an hour/for an hour*, and compatibility with individual level predicates. All the results combined point to the conclusion that K'iche' grammar must incorporate the abstract category Tense, and that Tense information is manipulated using the markers *x-* and *k-*. In section 5, I show that the analysis of *x-* and *k-* as Tense markers makes correct predictions for patterns of temporal matching in embedded clauses. Specifically,

¹ Glossing abbreviations are provided at the end. If not stated otherwise, the data I present is based on my fieldwork notes, which reflect the dialect of Santa Lucía Utatlán.

verbs that require their complements to match their own TA marker will be shown to restrict the interpretation of the complement in a way that can be explained if we assume what is going on is Tense concord (and not concord in Aspect). In section 6, I consider some data that seems to contradict the conclusion that *x-* and *k-* are Tense markers and argue that the contradiction is only apparent. I show that the marker *k-* can be used to refer to past events only in very specific circumstances, namely in a narrative discourse (as 'historical present'). This section highlights the importance of individual consultant work in addition to any corpus work in settling delicate questions such as this one. Section 7 concludes.

2. Tense, Aspect, and Tenseless Languages

A couple of housekeeping notes before we begin. First, as mentioned in the introduction, I will be adopting a Reichenbachian approach to Tense and Aspect, and I will take a moment to explain why. In essence, this model is adopted because it allows for a straightforward comparison of Tense and Aspect, unlike some alternatives. However, since most of the paper is concerned with temporal interpretation in main clauses where different approaches tend to make the same predictions, the conclusions I draw here should in principle be compatible with a different approach to Tense (e.g., Priorian, see Prior 1967).

Second, the paper presents positive evidence that K'iche' has Tense markers, framing this discussion in opposition to the idea that they are (im)perfective Aspectual markers. Of course, the perfective and imperfective are not the only typologically attested members of the category Aspect, so I should clarify why I am considering them as the alternative. The first reason has to do with following the received wisdom, since these TA markers are referred to as imperfective/incompletive and perfective/completive in the Mayan literature.² One obvious alternative would be to consider one of the markers to be a signal of the Perfect. I will not seriously consider this idea, for two reasons. The first is that both markers show properties uncharacteristic of the Perfect, for example *x-* is compatible with the K'iche' equivalent of the adverb *still* (see section 4) and *k-* is often, though not necessarily, interpreted as (a non-past) progressive, as will be obvious in the translations throughout. The second reason is that K'iche', in fact, has a distinct (deverbal) Perfect form, which I discuss briefly in section 4, see (16).³

With these caveats out of the way, let us walk through an overview of Tense and Aspect in the framework of Reichenbach (1947) and Klein (1994). We can conceptualize Tense and Aspect by

² To my knowledge, no formal distinction has been made between *imperfective* and *incompletive* on the one hand, and *perfective* and *completive*, on the other (though the latter terms are used more frequently in the Mayan literature). I will therefore treat them as terminological variants.

³ For further discussion of the K'iche' Perfect, see Duncan 2016.

assuming a threefold distinction between event time (ET), reference time (RT), and utterance time (UT), defined in (2).

- (2) a. ET: the time at which the event denoted by the main predicate takes place
- b. RT: the time for which the speaker makes a claim
- c. UT: the time at which the sentence is uttered

Tense is understood as expressing a relation between RT and UT. More specifically, Tense locates RT with respect to UT. For example, the time for which the speaker makes the claim in (3a), namely *at two o'clock*, is situated prior to UT. Past Tense is used to encode the anteriority of RT with respect to UT. In (3b), I give a schematic representation of the present, past, and future Tense in these basic terms. Following the pronominal approach to Tense (Partee 1973, Kratzer 1998), we can assume with Kratzer that Tense morphemes introduce presuppositions which restrict the reference of the RT variable. In (3c), I give Kratzer's denotation of the past, which, I will argue, corresponds to the interpretation of the K'iche' TA marker *x-*. Based on (3c), we can model the non-past in (3d), which we will see is the correct denotation for the TA marker *k-* in K'iche'.

- (3) a. John ate beans at two o'clock.
- b. $RT = UT$ (present); $RT_{-}UT$ (past); $UT_{-}RT$ (future)
- c. $[[\text{past}]]^{s,c}$ is only defined if c provides an interval t that precedes t_0 . If defined, then $[[\text{past}]]^{s,c} = t$.
- d. $[[\text{non-past}]]^{s,c}$ is only defined if c provides an interval t such that no part of t precedes t_0 .
If defined, $[[\text{non-past}]]^{s,c} = t$.

Grammatical Aspect, on the other hand, expresses a relation between ET and RT. The running time of the event denoted by the predicate in the imperfective/progressive (4a) properly includes the RT *this afternoon* ($RT \subseteq ET$). On the other hand, the predicate in the perfective (4b) states that the running time of the event *John read a book* is properly included in RT ($ET \subseteq RT$). These ideas are formalized in Kratzer 1998 (4c-d), for whom aspectual heads are operators that map properties of events onto properties of times, and Tense morphemes introduce presuppositions restricting the reference of the RT variable.

- (4) a. John was reading a book this afternoon.

b. John read a book this afternoon.

c. *imperfective*: $\lambda P_{\langle l, \langle s, t \rangle \rangle}. \lambda t_i. \lambda w_s. \exists e_1 (t \subseteq \text{time}(e) \ \& \ P(e)(w) = 1)$

d. *perfective*: $\lambda P_{\langle l, \langle s, t \rangle \rangle}. \lambda t_i. \lambda w_s. \exists e_1 (\text{time}(e) \subseteq t \ \& \ P(e)(w) = 1)$ (Kratzer 1998:107)

The main takeaway from this discussion is that, since Tense is always oriented with respect to UT, it is deictic, while Aspect is non-deictic. We can then make predictions about the behavior we expect from tense markers versus aspectual markers. The main prediction based on the above discussion is as follows: If a language is tenseless and only has aspectual marking, the location of RT—and hence ET—should not necessarily be restricted with respect to UT, modulo independent constraints of particular aspectual values (e.g. the resistance of the perfective to present interpretations).⁴ For example, it should be possible for a tenseless perfective predicate to denote containment with respect to a RT that is not UT. This should not be possible if the marker on said predicate is a past Tense marker, because past Tense encodes anteriority with respect to UT. Furthermore, assuming that the adverb *still* and its equivalents in other languages require that an eventuality hold at a given RT (e.g. Doherty 1973, König 1977, Abraham 1980, Michaelis 1993), we expect it to be compatible with the marker *x-* if *x-* is an exponent of past Tense, but not if it expones perfective Aspect. This is because our theory of Aspect states that perfective predicates denote events that are *properly contained* in the RT, and will therefore not hold at (the end of) RT.

Some languages without overt Tense morphology have been shown to have free (contextually determined) temporal reference. We can divide languages without overt Tense morphology into two broad classes: those with an obligatory marker for future interpretations (e.g. St'át'imcets, Matthewson 2006; Hausa, Mucha 2012, 2013; Paraguayan Guaraní, Tonhauser 2011), and those without (e.g. Navajo, Smith, Perkins and Ferland 2003, 2007; Mandarin Chinese, Lin 2003, 2006, 2010). The fact that unmarked sentences in the former languages cannot express future meanings has prompted the idea that such superficially tenseless languages in fact contain a phonologically null (non-future) Tense morpheme (Matthewson 2006). In this respect, K'iche' patterns with Navajo and Mandarin Chinese in that sentences with the marker *k-* can quite freely have either present or future interpretations (5). In (5), I give the two adverbs to force one of the two temporal readings; in their absence, the sentence can still be interpreted either as present or future, depending on the context. As (5) perhaps hints at, the availability of future interpretations with *k-*marking in K'iche' is not tied to scheduled events, unlike with the present progressive in English (cf. The Red Sox are playing tomorrow vs. #The Red Sox are winning tomorrow).

⁴ UT *is*, however, the default RT, so contextual manipulation is usually needed.

- (5) a. K- \emptyset -opan Ixno'j pa r-ochoch kamik / chwe'q.
 TA2-B3SG-come Ixno'j in A3SG-home now tomorrow
 'Ixno'j is coming home now / will come home tomorrow.'
- b. K- \emptyset -kam ri tz'i kamik / chwe'q.
 TA2-B3SG-die DET dog now tomorrow
 'The dog is dying now / will die tomorrow.'

If we can maintain that the prefixes *k-* and *x-* are aspectual, this would make K'iche a good candidate for a truly tenseless language. I will instead argue that *k-* is a non-past Tense marker, so nothing special will need to be said about (5). Before moving on to the main proposal of the paper, I offer a brief overview of K'iche' morphosyntax, and of the previous work on Tense and Aspect in Mayan.

3. K'iche' Morphosyntax & Previous Work on Mayan TA

K'iche', a Mayan language of the K'ichean branch, is spoken by over a million people in the highlands of Guatemala. With this in mind, a brief note on the data presented here: There are *at least* 5 distinct areas where K'iche' is spoken; my fieldwork was conducted on the dialect of Santa Lucía Utatlán, Sololá. The data that has previously been put forth to argue that K'iche' is a tenseless language comes from different K'iche' dialects (Larsen 1988). My aim here is not to argue that all K'iche' speakers have a Tense system; in fact, it is likely that they do not. The aim is a more modest one, namely, to show that some K'iche' speakers do, thus undermining the claim that all Mayan language lack the category Tense.

Before moving on to the main proposal of the paper, let us briefly review some of the fundamental facts of K'iche' morphosyntax. K'iche is a morphologically (and syntactically) ergative language, with ergativity manifested via agreement rather than noun phrase marking. As illustrated in (6a), subjects of intransitive verbs in K'iche' trigger the same (absolutive) marking on the verb as objects of transitives, to the exclusion of subjects of transitive verbs, which trigger ergative marking. This is a different alignment than that observed, for example, in the Bantu languages, where the verb tracks subjects—both transitive and intransitive—(often) to the exclusion of objects. We may compare the K'iche' system in (7a-b) with the Zulu system in (7c-d). In K'iche', the (null) subject person marker in the intransitive clause (7a) corresponds to the object marker in the transitive (7b); in Zulu, the agreement marking treats subjects (transitive and intransitive) as a natural class, to the exclusion of objects (7c-d). As seen in (7a-b), K'iche' TA affixes precede the verb root and the person markers.

(6) a.

Set A (ergative)	Set B (absolutive)
S – VTR	O – VTR
	S – VITR

Table 1: Nominative/Accusative Alignment

nominative	accusative
S – VTR	O – VTR
S – VITR	

Table 2: Ergative/Absolutive Alignment

(7) a. (Ikk'at) k-Ø-b'in-ik.

Ikk'at TA2-B3SG-walk-SS

'Ikk'at is walking.'

b. (Ikk'at) k-Ø-u-sik'ij.

Ikk'at TA2-B3SG-A3SG-call

'Ikk'at is calling him/her.'

c. u-Mlungisi u-ya-gijima

AUG-1Mlungisi 1S-YA-run

'Mlungisi is running.'

(Halpert 2012: 71, 81)

d. u-mntwana u-cul-e i-ngoma

AUG-1child 1S-sing-PFV AUG-9song

'The child sang a song.'

Finally, TA markers are typically found only on verbal predicates; the non-verbal predicate in (8a) can be used to refer to a present, past, or future eventuality in the appropriate context. With non-verbal predicates, speakers *may* use other means to indicate pastness, for example the particle *kan(oq)* in (8b). *Kan(oq)* is a distal particle which is not used uniquely to denote pastness—it also has locational uses. A discussion of the structure of non-verbal predicates is outside the scope of this paper, and I will not have much to say about it. What is clear is that, since K'iche' (and Mayan more generally) lacks overt copulas, Tense/Aspect information will only be detectable on verbal predicates. Moreover, the flexibility of the temporal reading in (8a) suggests that K'iche' non-verbal predicates are likely not dominated by (covert) Tense (see Pye 2011 on the syntax of Mayan 'stative' predication).

(8) a. Tel ri ja.

open DET house

'The house is/was/will be open.'

- b. Tel (kanoq) ri ja, are' chi' x-in-opon-ik.
 open PRT DET house when TA1-B1SG-arrive-SS
 'When I arrived, the house was open.'

Moving on to the main question of the paper, namely the status of the TA markers *x-* and *k-*, very little information is available as of now. Although there seems to be a consensus among Mayanists that Mayan languages lack Tense markers, and that the prefixes in question (*x-* and *k-* or their equivalents) are Aspectual, this is far more often stated or assumed than argued for. A notable exception is Bohnmeyer 2002, which discusses time reference in Yucatec Maya at considerable length, and shows that its temporal system is very complex, with over 15 “aspectual/modal” markers (see Bohnmeyer 2002:4). However, Yucatec Maya and K'iche' are not closely related, and the temporal system of K'iche' seems to be much more streamlined with 6 Tense/Aspect/Mood markers (Larsen 1988, Sis Iboy & López Ixcoy 2004). In addition to *x-* and *k-*, there is *ch-* (imperative), *j-* (directional imperative), *ma-* (admonitive), and the auxiliary verb *tajin*, used to mark the progressive. Since the two temporal systems seem to be quite distinct, I will leave Yucatec Maya aside.

The only data (I am aware of) given in support of treating the markers *x-* and *k-* in K'iche' as Aspectual, and not Tense, markers is in (9), adapted from Larsen 1988:163. Larsen argues that a *k-* marked verb can receive a past (9a), present (9b) or future interpretation (9c) depending on the context it appears in, that is, its temporal interpretation is free with respect to UT. Therefore, according to Larsen, *k-* cannot be considered a Tense marker.

- (9) a. K-∅-chakun-ik aree ri x-in-ok uloq.
 TA2-B3SG-work-SS when DET TA1-B1SG-enter hither
 'S/he was working when I came in.'

- b. Wachanim k-∅-chakun-ik.
 now TA2-B3SG-work-SS
 'S/he is working now.'

- c. K-∅-chakun chwe'q.
 TA2-B3SG-work tomorrow
 'S/he will work tomorrow.'

Note that, if *k-* is a non-past Tense marker, as I will argue, the data in (9b-c) is unproblematic, but (9a) still requires an explanation. I will put an explanation of (9a) on hold and return to it in section 6. In the following section, I apply the diagnostics from section 2 to determine whether this conclusion,

that the prefixes *x-* and *k-* are Aspectual markers, can be maintained. The answer I arrive at is negative; *x-* and *k-* are markers of past and non-past Tense, respectively.

4. K'iche' as a Tensed Language

Let us first examine whether temporal modifiers in K'iche' can shift the RT in a way that allows the TA-marked predicates to be oriented with respect to a RT that is not UT. Recall, if *x-* and *k-* are Aspectual markers, we expect the predicates they mark to be able to be oriented with respect to RT that is not UT. Since Tense is deictic (obligatorily oriented with respect to UT), we do not expect such shifts to be possible if *x-* and *k-* are Tense markers. In (10), we see that combining a *k-*-marked predicate with a past time adverb like *iwir pa nik'aj q'ij* 'yesterday at noon' results in unacceptability (10), unlike for the present and future oriented adverbs in (9b-c). Similarly, a *x-*-marked predicate cannot be combined with a future-oriented adverb.⁵

(10) Context: What was one thing that happened/was happening yesterday at noon? (a/b)

What is one thing that will happen tomorrow at noon? (c/d)

- a. *Iwir pa nik'aj q'ij k- \emptyset -kam ri tz'i.
 yesterday PREP middle day TA2-B3SG-die DET dog
intended: 'Yesterday at noon, the dog was dying.'
- b. *Iwir pa nik'aj q'ij k-in-b'in-ik.
 yesterday PREP middle day TA2-B1SG-walk-SS
intended: 'Yesterday at noon, I was walking.'
- c. *Chwe'q pa nik'aj q'ij x- \emptyset -kam ri tz'i.
 tomorrow PREP middle day TA1-B3SG-die DET dog
intended: 'Tomorrow at noon, the dog will die.'
- d. *Chwe'q pa nik'aj q'ij x-in-b'in-ik.
 tomorrow PREP middle day TA1-B1SG-walk-SS
intended: 'Tomorrow at noon, I will walk.'

Note that Larson's (9a) involves the use of a temporal *clause* to shift the RT, which is different from my use of temporal *adverbs* in (10). In relation to this, I should mention that temporal adverbs in

⁵ Present time reference would be independently excluded if *x-* were a perfective marker.

Hausa have been shown not to be sufficient to override the default temporal interpretations of Aspectual affixes (see Mucha 2012, 2013 for details). In Hausa, a rich context or a clausal complement is required for this purpose. I leave the *k-* marker in this context for discussion in section 6 and note that *x-* is incompatible with future time reference even when a temporal clause is used to shift RT forward. The future-oriented *when*-clause in (11a) should shift RT forward, and enable us to see whether *x-* can contribute the meaning of containment with respect to a RT that is not UT. Based on the previous discussion of the differences between Tenses and Aspects, this would qualify *x-* as an aspectual marker, but this is not what we observe in K'iche' (and it is apparently exactly what we observe in Kaqchikel (11b)).⁶

(11) a. *Are chi' **k**- \emptyset -opan Ixno'j pa r-ochoch chwe'q,
 when TA2-B3SG-come Ixno'j in A3SG-home tomorrow

Ixk'at **x**- \emptyset -u-tij ri aj.
 Ixk'at TA1-B3SG-A3SG-eat DET elote

intended: 'When Ixno'j comes home tomorrow, Ixk'at eat the elote.'

b. Täq xt- \emptyset -apon Ma Cornelio pa r-ochoch, Ya Esperanza **x**- \emptyset -way-in.
 when PROSP-B3SG-come CLF Cornelio PREP A3SG-house CLF Esperanza PRFV-B3SG-eat-AP
 'When Don Cornelio gets home, Doña Esperanza will have eaten.' (Baron 2017:6)

In (12a), we see that nothing is wrong with the temporal clause itself, and the sentence is fine if the matrix verb has the marker *k-*. Of course, the meaning is then changed: the situation in the temporal clause and the situation in the matrix are interpreted as either occurring simultaneously or sequentially. This is compatible with the idea that *k-* is a non-past Tense marker. To express the intended meaning of (11a), my consultant volunteered (12b), where the matrix predicate is in the perfect form, which has been argued to be a deverbal noun (Duncan 2016, Can Pixabaj & Aissen 2021), and which lacks TA marking altogether. The data from temporal adverbials shows that *x-* and *k-* in K'iche' behave like past and non-past Tense markers, respectively.

⁶ A possibly important difference between (11a) and (11b) is that the Kaqchikel sentence in (11b) contains the prospective TA-marker in the *when*-clause, while this form is not available to K'iche' speakers. Notice also that Baron translates the *x-* marked predicate in Kaqchikel with the English perfect; it is not clear whether this is intentional, or if the translation of the matrix clause should be 'Doña Esperanza will eat', which we expect if *x-* in Kaqchikel marks perfectivity, as indicated by the gloss. Regardless, neither of these readings are allowed in K'iche'; the string is unacceptable outright.

- (12) a. Are chi' k-Ø-opan Ixno'j pa r-ochoch chwe'q,
 when TA2-B3SG-come Ixno'j in A3SG-home tomorrow
 Ixk'at **k-Ø-u-tij** ri aj.
 Ixk'at TA2-B3SG-A3SG-eat the elote
 'When Ixno'j comes home tomorrow, Ixk'at will eat/be eating the elote.'
- b. Are chi' k-Ø-opan Ixno'j pa r-ochoch chwe'q,
 when TA2-B3SG-come Ixno'j in A3SG-home tomorrow
 Ixk'at **tij-taj-inäq** chi le aj r-umal.
 Ixk'at eat-PASS-PERF PREP DET elote A3SG-RN
 'When Ixno'j comes home tomorrow, the elote will have been eaten by Ixk'at.'

Moving on to temporal *still*, recall from our discussion of Tense and Aspect that this adverb requires “extension of a state of affairs through to a given reference time” (Michaelis 1993:193; see also Doherty 1973, König 1977, Abraham 1980). In other words, temporal *still* imposes a restriction that a situation denoted by the predicate must hold at RT. Perfective predicates will clash with this requirement because the running time of a perfective predicate is properly contained in RT, and will therefore not hold at (the end of) RT. This is illustrated in (13) for English, Spanish, and Bosnian/Croatian/Serbian (BCS).⁷

- (13) a. *At two o'clock, John still built a house.
- b. *A las dos, Juan todavía construyó una casa.
 in DET two Juan still build.PST.PRFV DET house
- c. U dva, Jovan je i dalje (*sa)gradio kuću.
 in two Jovan AUX still PRFV-built house

If the markers *k-* and *x-* were Aspectual, we could expect that an adverb like *na* 'still' would only be compatible with the imperfective, but not with the perfective. This is not the result we obtain: in K'iche', *na* 'still' is compatible with both markers (15a-b). In (15c), I show that the equivalent example in BCS is bad if the perfective prefix is attached. The acceptability of (15b) again suggests that *x-* is not a marker of (perfective) grammatical Aspect.

⁷ The English example also has the irrelevant concessive reading (see Smith 2009), which the reader is asked to ignore. The Spanish and BCS adverbs are not similarly ambiguous, and the examples are therefore irreparably bad.

- (15) a. Ri ak'al k-Ø-u-koj **na** ri to'q.
 DET boy TA2-B3SG-A3SG-use still DET diapers
 'The boy still uses diapers.'
- b. Ri ak'al x-Ø-u-koj **na** ri to'q (junab'ir).
 DET boy TA1-B3SG-A3SG-use still DET diapers last-year
 'The boy was still using diapers a year ago.'
- c. Dečak je prošle godine **i dalje** (*is)koristio pelene.
 boy AUX last year still PRFV-used diapers
 'Last year, the boy was still using diapers.'

Of course, talking about such and such lexical item (in this case, the adverb *still*) in different languages is always precarious, because we need to be certain that the two elements have exactly the same meaning in the relevant sense. Importantly for our purposes, Perfect predicates can also not combine with *still*, arguably because the Perfect denotes anteriority with respect to RT. I illustrate this for English in (16a). Fortunately, K'iche' also has a (non-verbal) form whose meaning is equivalent to the Perfect. Therefore, one way to test whether the adverb *na* 'still' has the same meaning as its English equivalent is to attempt to make it a modifier of a Perfect participle. As seen in (16b), this leads to unacceptability, as we predict. If we substitute the predicate with a *x*-marked verb (16c), the sentence is fine, strengthening our conclusion that *x*- does not mark perfective Aspect. Notice also that this possibility to essentially force an imperfective reading of the *x*-marked predicate in (16c) suggests that we are not dealing with a situation where Tense and Aspect are jointly expressed by one morpheme (as in the case of the Spanish *pretérito indefinido*, for example).

- (16) a. *At two o'clock, John has still built a house.
- b. Are chi' x-Ø-opan Ixno'j pa r-ochoch, Ixk'at
 when TA1-B3SG-come Ixno'j in A3SG-home Ixk'at
 tij-taj-**inaq** (***na**) chi le aj r-umal.
 eat-PASS-PERF still PREP DET elote A3SG-RN
intended: 'When Ixno'j came home, Ixk'at had still eaten the elote.'
- c. Are chi' x-Ø-opan Ixno'j pa r-ochoch, x-Ø-in-tij **na** ri aj.
 when TA1-B3SG-come Ixno'j in A3SG-home TA1-B3SG-A1SG-eat still DET elote
 'When Ixno'j came home, I was still eating the elote.'

I now turn to diagnostics which are not immediately motivated by the Reichenbachian theory of Tense and Aspect, but which are nevertheless grounded in robust cross-linguistic tendencies, if not universals. One such diagnostic is (in)compatibility with *in/for an hour*-type adverbials. If *x-* were a perfective marker, we would expect that a *x*-marked telic predicate like 'read the book' would only be possible with an 'in an hour'-type adverbial, but not with a 'for an hour'-type adverbial, as is the case in BCS (17a-b).⁸ This is not the result we obtain. By manipulating the temporal adverbial, the *x*-marked K'iche' predicate in (17c-d) can receive both a perfective and an imperfective interpretation, which is predicted if *x-* is a past Tense marker, but not if it is a marker of (perfective) grammatical Aspect. The same is true for the marker *k-* (17e-f).

- (17) a. Marija je **pro**-čitala knjigu *(za) dva sata.
 Mary AUX PRFV-read book in two hours
 'Mary read the book in two hours.'
- b. Marija je čitala knjigu *(za) dva sata.
 Mary AUX read.IMPV book in two hours
 'Mary read the book for two hours.'
- c. Ixno'j **x-Ø-u-sik'ij** le wuj **xa keb' kajb'al**.
 Ixn'oj TA1-B3SG-A3SG-read DET book just two hour
 'Ixno'j read the book for two hours.'
- d. Ixno'j **x-Ø-u-sik'ij** le wuj **pa keb' kajb'al**.
 Ixn'oj TA1-B3SG-A3SG-read DET book in two hour
 'Ixno'j read the book in two hours.'
- e. Are chi' **k-Ø-opan** ri Lu' pa r-ochoch, Gilda
 when TA2-B3SG-come DET Pedro in A3SG-home Gilda

k-Ø-u-b'an ri wa **xa keb' kajb'al**.
 TA2-B3SG-A3SG-make DET food just two hour
 'When Pedro comes home, Gilda will make the food for two hours.'
- f. Are chi' **k-Ø-opan** ri Lu' pa r-ochoch, Gilda
 when TA2-B3SG-come DET Pedro in A3SG-home Gilda

k-Ø-u-b'an ri wa **pa keb' kajb'al**.
 TA2-B3SG-A3SG-make DET food in two hour

⁸ For a discussion of this point, see Iatridou, Anagnostopoulou and Izvorski 2001.

‘When Pedro comes home, Gilda will make the food in two hours.’

The final diagnostic concerns a temporal marker’s (in)compatibility with individual level predicates. It is not uncommon for this type of predicate to resist overt Aspectual marking (particularly imperfective marking). In (18a-c), I illustrate this for English, Spanish, and BCS.⁹

- (18) a. *Mary was knowing John.
 b. *María esta-ba siendo alta.
 Mary be-PST.IMPF being tall
 intended: ‘Mary was being tall.’
 c. Marijina baka ima jedno dete.
 Mary’s grandmother has one child
 ‘Mary’s grandmother has one child.’

Having said this, one reason to think that the K’iche’ prefixes *k-* and *x-* are aspectual is that the most frequently used individual-level predicates are not compatible with them (19a-b). However, there seems to be some evidence that the incompatibility of the affixes *x-* and *k-* with the predicates in (19a-b) has nothing to do with their stativity, but rather with the fact that they are not verbs at all. This then eliminates the argument that the prefixes do not combine with these predicates because verbs that denote individual-level predicates resist aspectual affixation.

- (19) a. Ri r-ati’t Ixno’j (*x-)/ (*k-) **k’o** jun r-al.
 DET A3SG-grandmother Ixno’j TA1 TA2 EXS one A3SG-child
 ‘Ixno’j’s grandmother has one child.’
 b. Ri w-ati’t (*x-)/ (*k-) **r-eta’m** ri ojer tzij.
 DET A3SG-grandmother TA1 TA2 A3SG-know DET before word
 ‘My grandmother knows the stories of before.’

For starters, several authors have noted that, in addition to the status suffix (*-ik*),¹⁰ the existential *k’o* we saw in (19a) takes positional inflection (*-l-*) in clause-final position (Sis Iboy & López Ixcoy 2004, Duncan 2010, Pye 2010). Compare the existential in (20a) with the uncontroversial positional in

⁹ The SC form is underspecified for aspect and would need to be perfectivized before we added the secondary imperfective *-va-* to it. However, since the many available perfective prefixes are lexically determined and impossible to predict, I do not attempt any single one of them in (16c); all are impossible.

¹⁰ The status suffix appears when *k’o* is at the end of an intonational phrase, which is why it is absent in (16a).

(20b).¹¹ The existential *k'o(lik)* marks person like other non-verbal predicates (nouns, adjectives, numbers and positionals), namely as a clitic separate from the root, and it has no TA marking (20c-d). Verbs, on the other hand, obligatorily carry a TA marker, followed by a person affix (20e). To reiterate, the reason that *k'o(lik)* does not combine with the markers *k-* and *x-* is not because it is stative, but because these markers only combine with verbs, and *k'o(lik)* is a non-verbal predicate.

(20) a. *Keb' n-ub'i' ∅ k'o-I-ik.*

two A1SG-name B3SG EXS-POS-SS

'I have two names.'

b. *Ri ja ∅ tz'api-I-ik.*

DET house B3SG closed-POS-SS

'The house is closed.'

c. *E k'o waral*

B3PL EXS here

'They are here.'

d. *E räx / Maya' winäq / oxib' / q'oy-ol-ik.*

B3PL green Maya person three lie_down-POS-SS

'They are green/ Mayan people / three / lying down.'

e. *X-e-q'oy-ik.*

TA1-B3PL-lie_down-SS

'They lay down.'

As for the predicate *eta'm* 'know' in (19b), I will argue that is not a verb either; we can therefore not use its incompatibility with the prefixes *x-* and *k-* to argue for their aspectual status. To see this, consider (21), with the derived transitive verb *eta'maj* 'learn'. Derived transitive verbs are transitive verbs "derived from other parts of speech such as intransitive verbs, nouns, positionals, adjectives" (Sis Iboy & López Ixcoy 2004, my translation). Under the reasonable assumption that the transitive verb *eta'maj* 'learn' in (21) is derived from the predicate *eta'm* 'know' in (19b), *eta'm* cannot be considered a verb. The reason is that the suffix *-aj* only attaches to intransitive verbs, and intransitive verbs always carry B (absolutive) marking, never A (ergative) marking, unlike *eta'm* in (19b). One type of predicate that consistently carries A marking and has a complement (but does not have TA marking) are so-called relational nouns, and *eta'm* may well belong to this class.

¹¹ Positionals are a distinct and productive root class in Mayan languages (see Coon 2016 for a recent overview).

- (21) Ri ak'al **k-Ø-r-eta'm-aj** k-Ø-b'in r-uk' jun b'ineb'al.
 DET boy TA2-B3SG-A3SG-know-VTD TA2-B3SG-walk A3SG-RN one walker
 'The boy is learning to walk with a walker.'

Since we have concluded that the two most common stative predicates in K'iche' are non-verbal, we may attempt to look for other stative (individual level) verbs and see how they interact with the markers *k-* and *x-*. However, true stative verbs are hard to come by in K'iche'. For example, the equivalents of the English verbs *contain* and *consist* are both formed using the non-verbal predicate *k'o(lik)* (22a-b). In fact, I was able to find one verbal individual level predicate, shown in (22c). The verb *ch'obik* 'know/understand' in (22c) obligatorily takes a TA marker, and generally behaves like an ordinary transitive K'iche' verb. If we thought that *k-* was an imperfective marker, it would be difficult to explain its compatibility with *ch'obik* (cf. (18)); under the view that *k-* is a non-past Tense marker, nothing special needs to be said about (22c).

- (22) a. Le chocolate **k'o** asucal **r-uk'**.
 DET chocolate EXS sugar A3SG-RN
 'Chocolate contains sugar.', *lit.* 'Chocolate has sugar with it.'
- b. We tijonik ri **k'o** kajib' chak **u-pam**.
 DET class DET EXS four job A3SG-stomach
 'This class consists of four parts.', *lit.* 'This class has four jobs/exercises in its stomach.'
- c. **K-Ø-u-ch'ob'o** Kaqchikel / jas ri u-b'i ri u-nan.
 TA2-B3SG-A3SG-know Kaqchikel what DET A3SG-name DET A3SG-mother
 'S/he knows Kaqchikel / what his/her mother's name is.'

In this section, I have shown that the K'iche' prefixes *x-* and *k-* behave as (past and non-past) Tense markers rather than Aspectual markers. In the following section, I show that this analysis also makes the correct predictions for patterns of temporal matching we observe in embedded clauses. Finally, we are yet to discuss the data that suggests *k-* can sometimes be used in past contexts; I address this in section 6, where I show that *k-* has some extended uses familiar for present Tenses from languages like English: it can be used in narrative contexts and in talking about habitual actions.

5. Temporal Matching in Embedded Clauses

In this section, I will primarily be interested in verbs that take clausal complements and force a particular TA-marking on their complement. However, let me first say a few words about temporal interpretation in embedded contexts in K'iche' more generally. One interesting phenomenon that occurs in embedded contexts in some languages is Sequence of Tense (SOT). In English, for example, if a matrix reporting verb is in the past Tense, the embedded predicate is backshifted; the embedded verb is marked for past Tense in (23), even though what Mary said was “John is jumping”. Such data in K'iche' could be of interest to us, but only in case the language has SOT. If there is SOT, then the language presumably has Tense. However, if there is no SOT, then we are either dealing with a Tensed language without SOT (like BCS, for example), or with a language without Tense. Although I have not been able to collect much data on embedded clauses so far, I report (24) here as an indication that K'iche' may have SOT. In (24), the predicate *b'isonik* ‘be sad’ is interpreted as simultaneous to the saying event, yet we have *x*-marking in the embedded clause, suggesting that there is backshifting, as in the English case (23). More work is necessary on K'iche' embedded clauses to determine if this conclusion holds and generalizes.

(23) Mary said that John was jumping.

(24) Iwir pa nik'aj q'ij Ixk'at x-Ø-u-b'ij chi x-Ø-b'ison-ik.
 yesterday PREP middle day Ixk'at PST-B3SG-A3SG-say that PST-B3SG-be.sad-SS
 ‘Yesterday at noon, Ixk'at said that she was sad (then).’

Moving on to cases of so-called concord, some K'iche' verbs require the verbs in their complement to bear the same TA marker. One such verb is the CP-complement-taking verb *ilik* ‘see’, if it is interpreted as a verb of direct perception (25); (25) “would be appropriate in a context where I see you speaking (for instance, where I perceive your mouth moving and/or you are addressing some people)” (Can Pixabaj 2015:181). As we can see in (25), a *k*-marked verb in the matrix forces *k*-marking in the embedded clause (25a), and the same goes for *x*-marking (25b).

(25) a. K-Ø-inw-il-o chi (k)/(*x)-at-ch'aaw-ik.
 TA2-B3SG-A1SG-see-SS COMP TA2 TA1-B2SG-speak-SS
 ‘I see you speaking.’

b. X-Ø-inw-il-o chi (*k)/(x)-at-ch'aaw-ik.
 TA1-B3SG-A1SG-see-SS COMP TA2 TA1-B2SG-speak-SS
 ‘I saw you speak.’

(adapted from Can Pixabaj 2015:181)

In reference to sentences like (25), Can Pixabaj writes: “The reason that Aspect must match in direct perception clauses is that the time of the matrix clause event and the time of the complement clause event must be the same. In Noonan’s [2007] terms, the complement of a direct perception predicate has determined/dependent time reference (DTR).” While the reference to Noonan is justified, it seems quite implausible that the event times of the two predicates must match exactly, that is, that the time of the seeing event must overlap exactly with the speaking event. If the English translation tells us anything, it should be possible to modify the matrix predicate by an adverbial like ‘at noon’; this should still tell us nothing about the event of speaking, which could have gone on for an indefinite amount of time before and after the seeing event. This is exactly what we observe: the interpretation of (26) is one where the seeing occurred at noon, but the speaking could have started before and continued after noon.

- (26) Pa nik’aj q’ij x-ø-inw-il-o chi x-at-ch’aaw-ik.
 in middle day TA1-B3SG-A1SG-see-SS COMP TA1-B2SG-speak-SS
 ‘At midday, I saw you speak.’

What seems more likely is that this is a case of Tense concord: if the RT of the matrix clause precedes UT, then so must the RT of the complement clause *in order to get the interpretation in (25)-(26)*. In fact, the verb *ilik* has another meaning, namely ‘realize’, and in this case there is no TA matching in the embedded clause. In other words, it is the meaning of the direct perception predicate of seeing that forces the Tense concord in (25)-(26) and allows for a partial overlap interpretation. Analyzing *x-* and *k-* as Tense markers allows us to account for the observed patterns; treating them as Aspectual markers does not.

6. Past Reference with *k-* and an Apparent Paradox

We still need to account for the fact that *k-* can sometimes apparently be used in past contexts. Recall Larsen’s (1988) examples given in (8), repeated here as (27).

- (27) a. K-Ø-chakun-ik aree ri x-in-ok uloq.
 TA2-B3SG-work-SS when TA1-B1SG-enter hither
 ‘S/he was working when I came in.’

- b. Wachanim k-Ø-chakun-ik.
 now TA2-B3SG-work-SS
 'S/he is working now.'
- c. K-Ø-chakun chwe'q.
 TA2-B3SG-work tomorrow
 'S/he will work tomorrow.'

On the view that *k-* is a marker of non-past Tense, (27a) is seemingly problematic. We have already noted that simple past time adverbs cannot take the place of the temporal clause in (27a). However, once temporal clauses come into play, the data gets even messier than (27a): *k-* can have past time reference, both in the temporal clause and in the matrix clause (28).¹² In fact, the translation given in (28b) does not even paint the full picture: its three possible interpretations are given in (29).

- (28) a. Iwir k-Ø-chakun Ixno'j are chi' x-in-ok uloq.
 yesterday TA2-B3SG-work Ixno'j when TA1-B3SG-enter hither
 'Yesterday, Ixno'j was working when I came in.'
- b. Are chi' k-in-sik'ij le wuj, le w-ixoqil k-Ø-u-b'an le qa-rikil.
 when TA2-B1SG-read DET book DET A1SG-wife TA2-B3SG-A3SG-make DET A1PL-food
 'While I was reading the book, my wife was making our food.'
- (29) Are chi' k-in-sik'ij le wuj, le w-ixoqil k-Ø-u-b'an le qa-rikil.
 when TA2-B1SG-read DET book DET A1SG-wife TA2-B3SG-A3SG-make DET A1PL-food
 I. 'While I was reading the book, my wife was making our food.' (PAST IMPERFECTIVE)
 II. 'When I read the book, my wife will make our food.' (FUTURE PERFECTIVE)
 III. 'While I read the book, my wife will be making our food.' (FUTURE IMPERFECTIVE)

On the face of it, (29) and its kin look bad for both the Aspectual analysis and the Tense analysis, since it seems like *k-* can be interpreted as both perfective and imperfective, and as both past and future. A possible solution to this conundrum is quite simple: *k-* is a marker of non-past Tense (underdetermined with respect to Aspect), and non-past Tense can be used in specific discourse contexts to talk about past events (so called 'narrative' or 'historical' present). This allows us to explain why (i) only *k-*, but not *x-*, allows such shifts, and (ii) a richer context, and not just a temporal adverb, is necessary to license its use. In English, also, it is not possible to use the historical present for isolated sentences like

¹² As we have seen, it is not possible to shift the RT with *x-* in this way; *x-* still cannot have future time reference, cf. (11a).

(30a), which is parallel to (10b); (30b), which is parallel to (29), is much better. In fact, when I questioned my consultant further about the acceptability of the *string* in (10b), she maintained that it is impossible in the context given there, but that it would be possible if she proceeded to then tell me a whole story about what happened yesterday. This is compatible with the idea that *k-* is used for past reference when the speaker is using it as a narrative device, just like in English.

- (30) a. *Yesterday, I'm sitting in my office.
 b. Yesterday, I'm sitting in my office when Justin comes in and...

In addition to the 'narrative present' explanation I offered for the availability of (9a)/(27a), it is also worth noting that this *string* is also acceptable under another interpretation, which still does not threaten its analysis as fundamentally a Tense marker. Namely, present (or non-past) Tenses are frequently used cross-linguistically to talk about habitual events (31). Since this factor is not controlled for in (9a)/(27a), for example by introducing a temporal adverbial like *iwir* 'yesterday', one of the possible interpretations of (9a)/(27a) is 'She usually works (at the time) when I came in'.

- (31) Ixno'j k-Ø-chakun ronojel q'ij pa tinamit.
 Ixno'j TA2-B3SG-work every day in village
 'Ixno'j works in the village every day.'

I used this section to show that the marker *k-* behaves pretty much exactly as we would expect a non-past Tense marker to behave. In addition to its core uses, it can be used to refer to past events in a narrative discourse, and to talk about habitual events. I hope to have also highlighted through this discussion the importance of individual consultant work, in addition to any corpus work, when deciding delicate matters such as this one. Put plainly, it would have been much harder to deduce from a text whether a speaker is using the marker *k-* in a past context as a narrative device, or whether its use truly indicated its status as a non-Tense marker.

7. Conclusion

In this paper, I presented evidence that the K'iche' prefixes *x-* and *k-* mark past and non-past Tense, respectively. Their denotations are as follows:

- (32) a. $[[\text{past}]]^{\text{g,c}}$ is only defined if *c* provides an interval *t* that precedes t_0 . If defined, then $[[\text{past}]]^{\text{g,c}} = t$.

- b. $[[\text{non-past}]]^{\text{g,c}}$ is only defined if c provides an interval t such that no part of t precedes t_0 .
If defined, $[[\text{non-past}]]^{\text{g,c}} = t$.

This conclusion contrasts with what has been claimed in the literature so far, namely that these are Aspectual markers, and challenges the widespread view that all Mayan languages lack overt Tense morphology (and the category Tense, more generally). We also saw some indications that the same prefixes in the closely related language Kaqchikel may indeed be Aspectual (though this issue merits further research). Although novel, the idea about the distinct functions of TA morphemes even in closely related Mayan languages should not be surprising; since the differences in the distribution of Tense and Aspect markers are subtle, it is easy to expect their reanalysis.

8. Abbreviations

Abbreviations in glosses are as follows: 1, 2, 3 = 1st, 2nd, 3rd person, A = set A marker (ergative), AUX = auxiliary, B = set B marker (absolutive), COMP = complementizer, DET = determiner, EXS = existential, PL = plural, POS = positional, PASS = passive, PERF = perfect, PRED = non-verbal predicate, PREP = preposition, PRFV = perfective, PRT = particle, RN = relational noun, SG = singular, SS = status suffix, TA1 = tense/aspect/mood marker 1 (traditionally perfective), TA2 = tense/aspect/mood marker 2 (traditionally imperfective), VTD = derived transitive verb.

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