

# Temporal anaphora in a tenseless language\*

*Jürgen Bohnemeyer*

## 1. Introduction

This chapter presents a portrait of a language that arguably lacks absolute (i.e., deictic) and relative (i.e., anaphoric) tenses and temporal connectives with meanings comparable to those of English *after*, *before*, *until*, and *while*. The language is Yucatec Maya. “Tenselessness”, the absence of tenses from the grammar of a language, has been documented for a number of languages.<sup>1</sup> Yucatec goes beyond tenselessness in its simultaneous lack of temporal connectives of the indicated kind. However, the emphasis in this chapter is on tenselessness and on the question how Yucatec speakers manage to communicate about time in the face of it.

It is assumed in this chapter that tenses express binary ordering relations between the time about which an utterance makes a statement, asks a ques-

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\* Sections 2 and 3 of this chapter present a summary of chapters 4–7 of Bohnemeyer (1998b) and (2002). The research presented in these works was fully funded by the Max Planck Society. The examples used in section 3 are mostly new, though, and the analysis of one of the aspect-mood markers of Yucatec – the remote future (“predictive” in Bohnemeyer 1998b, 2002) – has been revised in light of new evidence. The account of temporal anaphora in section 4 is an informal version of the analysis I presented at the SULA 5 conference in São Paulo in May 2007 (though using different material for illustration). This analysis is an update of the one in Bohnemeyer (1998b, 2000a/b, 2002), preserving its Gricean core, but attempting a simpler, more concise, and more rigorous formulation (and integration into the DRT framework, which is not discussed in the present paper).

<sup>1</sup> Cf., e.g., Bittner (2005, 2007) and Shaer (2003) on Kalaallisut (or West Greenlandic); Comrie (1976: 82–84) on Igbo and Yoruba; Comrie (1985: 50–53) on Burmese and Dyirbal; and Li & Thompson (1981: 184, 213–215) on Mandarin. Tenselessness may also be discussed in terms of the absence of tense marking in particular utterances, rather than in the entire grammar. For instance, Smith, Perkins & Fernald (2007) argue that Navajo has a future-non-future tense system, but that tense marking is optional in this language. The interpretation of tenseless utterances in Navajo, based on these authors’ observations, appears to rely on principles similar to those proposed for Yucatec in section 4.

tion, or issues a command, etc. – the **topic time** of the utterance, following Klein 1994 (see also chapter 2 of this book) – and, in the case of deictic tense, the time *at* which the utterance is made or interpreted (the **coding time**), or, in the case of anaphoric tenses and temporal connectives, some time mentioned in discourse – the **reference point**.<sup>2</sup> In this framework, Yucatec can be characterized as a language in which the topic times of utterances are not constrained vis-à-vis utterance times or reference points by the morphosyntactic form of the clause (but adverbials may of course be used to determine them). This claim is defended in section 3 and possible exceptions are discussed there as well. Beyond making the case for the existence of languages such as Yucatec, the main concern of this chapter is the question of how Yucatec speakers determine the topic times of utterances in the absence of explicit coding. The proposal developed in section 4 is that they rely on inference mechanisms of **temporal anaphora** which are shared with Indo-European languages and, presumably, universal.

Temporal anaphora is the contextual determination of topic times. Temporal anaphora resolution depends on many factors, including the semantics of aspectual and modal operators (aside from lexical semantic properties, rhetorical structure, and world knowledge). The main emphasis in the present chapter is on the impact of aspectual operators. Consider (1):

- (1) a. Floyd entered. Sally made a phone call.  
b. Floyd entered. Sally was making a phone call.

According to the standard analysis of temporal anaphora in Discourse Representation Theory (DRT; cf. Kamp 1979; Kamp & Rohrer 1983; Kamp & Reyle 1993; Hinrichs 1981, 1986), the second sentence in (1a) introduces a

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<sup>2</sup> In the case of assertions, the topic time is the (implicitly or explicitly given) time for which it is claimed that some state of affairs holds. If the utterance concerns an event, the topic time may be different from the time of the event; the ordering relation between topic time and event time (or “situation time”, in Klein’s terminology) is expressed by viewpoint-aspectual operators. For example, imperfective viewpoints place the topic time inside the time of the event, while perfective viewpoints inversely place the time of the event inside the topic time. Klein’s “topic time” corresponds broadly to the adaptation of Reichenbach’s (1947) “reference point” in the DRT literature. In contrast, in the present framework, “reference point” is used for the time interval with respect to which topic times may be determined. A pure anaphoric tense on this account is an operator that expresses a relation between topic time and some reference point in the same way a pure deictic tense expresses a relation between topic time and coding time.

new topic time (in the present terminology) following that of the first sentence, with the event time of the phone call included in the new topic time, whereas the progressive in (1b) introduces a state to the discourse representation whose run time includes the topic time, and that reference time is unchanged from the first sentence, as if the second sentence tracked it anaphorically.<sup>3</sup>

The account sketched in this chapter presents the determination of topic time vis-à-vis coding time in Yucatec as a special case of temporal anaphora. The existence of temporal anaphora in a tenseless language such as Yucatec is itself not surprising, but nevertheless remarkable: it shows that temporal anaphora it is not an anaphoric meaning component of tense morphemes, as assumed in Partee (1973) and the DRT literature. Topic times play a role in the interpretation of utterances whether or not these are tensed, and the principles involved in their contextual resolution are the same in tensed and tenseless languages.

The account of temporal anaphora developed here treats the inferences involved in topic time resolution as Gricean generalized conversational implicatures. Part of the evidence in favor of this approach is the non-monotonicity of the inferences. Contra Bittner (2008), the inferences are just as defeasible in the “aspectually fully explicit” Yucatec as they are in English. The Gricean analysis accounts for both the non-monotonicity of the inferences, which is attributed to vagueness in the DRT literature, and for their default character. The Gricean account offers a parsimonious alternative to the assumption of special principles governing the deictic interpretation of tenseless sentences, as proposed in Smith, Perkins & Fernald (2007).

The following section presents a thumbnail sketch of the resources involved in temporal reference in Yucatec. Section 3 summarizes the evidence for tenselessness, and section 4 lays out the analysis of temporal anaphora.

## **2. A sketch of the Yucatec grammar and lexicon of temporal reference**

### **2.1. Background**

Yucatec is the largest member of the Yucatecan branch of the Mayan language family. It is spoken by 759,000 people in the Mexican states of Campeche, Quintana Roo, and Yucatán, and approximately 5,000 people in the

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<sup>3</sup> Hence the term “temporal anaphora” originally coined in Partee (1973) and identified as a metaphor in Partee (1984).

Cayo District of Belize (Ethnologue 2005).<sup>4</sup> Yucatec is the language whose autodenomination, *Maya*, has been adapted by scholars to name the Mayan language family.

Yucatec is a polysynthetic language in the sense that syntactic relations tend to have morphological reflexes at the word level and in the sense that a single content word, in combination with the necessary function words and inflections, may – and frequently does – constitute a clause. In terms of the morphological complexity of content words, Yucatec is situated towards the high end among Mayan languages, but in a more central position among Mesoamerican languages overall. Yucatec is mostly head-initial, and in particular verb-initial, but this fact is somewhat obscured by the high frequency of left-dislocations and focus constructions in discourse. The language has a typologically unusual argument marking system in which the single core argument of an intransitive clause patterns with either the actor or the undergoer argument of an active transitive clause depending on aspect-mood inflection.<sup>5</sup>

There are five sources of overtly expressed temporal information in Yucatec: lexical items, the verb inflection system, adverbials, connectives, and certain nominal suffixes. The following subsections address these in turn.

## 2.2. Lexical items

Yucatec has a complex system of lexical categories not all niceties of which are as yet fully understood. The following thumbnail sketch summarizes the analysis presented in Bohnemeyer (2002, 2004) and Bohnemeyer & Brown 2007. This analysis proposes a taxonomic organization with a top-level split between verbs and other categories. Verbs obligatorily inflect for a functional category called **status** (following Kaufman 1990) in all syntactic environments in which they function as verbs. Status inflection expresses, in a single suffix position, distinctions of viewpoint aspect, modality, and

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<sup>4</sup> Based on 2005 Census data, which register a decline by more than 40,000 speakers age five or older since 2000 (<http://www.inegi.gob.mx/est/contenidos/espanol/rutinas/ept.asp?t=mlen10&c=3337>).

<sup>5</sup> This is an atypical “split-S” or “active-inactive” pattern in which the morphological treatment of the core argument of intransitive clauses is fully determined, not by the lexical semantic properties of the verb, but instead by inflectional distinctions akin to those found in split-ergative case marking systems; cf. Bohnemeyer 2004 and references therein.

illocution; cf. below. The architecture of the status system differs from language to language; in Yucatec, there are five subcategories: completive, incomplete, subjunctive, extra-focal, and imperative status. Every verb form must be morphologically specified for exactly one of these subcategories in any syntactic environment – there is no finiteness contrast with regard to status inflection. In contrast, stative predicates are incompatible with status inflection. All content words – other than verb roots or stems – can form stative predicates by themselves, without the need of a copula.

- (2) Túumben le=nah=o'  
 new(B3SG) DET=house=D2  
 'The house is/was/will be new'

Stative predicates include nouns, adjectives, and deverbal statives. Verb stems fall into five different “conjugation” classes distinguished by paradigms of allomorphs of the status suffixes, which are termed “active”, “inactive”, “inchoative”, “positional”, and “transitive” in Bohnemeyer (2002, 2004).<sup>6</sup> As shown in Bohnemeyer (2001, 2002, 2004), membership in these verb stem classes is strikingly well motivated in terms of causativity and the distinction between processes and state changes. Both processes and state changes are dynamic eventualities that involve change in some property over time. Process descriptions either leave the event participant to whom the changing property is attributed unexpressed (e.g., *paint*, as opposed to *paint a picture/the wall*) or fail to specify a reference point with respect to which the change could be evaluated (e.g., *walk*, as opposed to *walk to the station*); cf. Bohnemeyer & Swift 2006. The Yucatec active class includes underived process verb stems – especially manner of motion (e.g., *áalkab* ‘to run’; *bàab* ‘to swim’) and sound emission verbs (e.g., *hàayab* ‘to yawn’; *òok’ol* ‘to cry’), denominal verb stems (e.g., *e’l* ‘egg’, ‘testicle’ > ‘to ovulate’, ‘to lay eggs’; *míis* ‘broom’ > ‘to sweep’), antipassive stems derived from transitive roots (e.g., *k’ay* ‘to sing sth. (song)’ > *k’àay* ‘to sing’; *tus* ‘to lie to sb.’ > *tùus* ‘to lie’), and all intransitive stems derived from Spanish roots, regardless of their semantics – the most important exception to motivation in terms of process semantics (e.g., *áatrasáar* ‘to become late’; *duràar* ‘to last’; *gáanar* ‘to win’). The majority of process stems describe “internally caused” activities (including all of the examples cited above); but externally caused events are likewise lexicalized in active roots (though without encoding their cause; e.g., *balak* ‘roll’, *chíik* ‘shake’, ‘rattle’;

<sup>6</sup> *V* denotes a vowel whose quality is copied from the preceding root vowel.

*péek* ‘move’, ‘wiggle’) (cf. Smith 1978 and Levin & Rappaport-Hovav 1995 on the distinction between internal and external causation).

Table 1. Status polysemy and verb stem classes

STATUS STEM CLASS	INCOM- PLETIVE	COMPLETIVE	SUB- JUNCTIVE	EXTRA- FOCAL	IMPERATIVE
active	-Ø	- <i>nah</i>	- <i>nak</i>	- <i>nahik</i>	- <i>nen</i>
inactive	- <i>VI</i>	-Ø	- <i>Vk</i>	- <i>ik</i>	- <i>en</i>
inchoative	- <i>tal</i>	- <i>chah</i>	- <i>chahak</i>	- <i>chahik</i>	N/A
positional	- <i>tal</i>	- <i>lah</i>	- <i>l(ah)ak</i>	- <i>lahik</i>	- <i>len</i>
transitive active	- <i>ik</i>	- <i>ah</i>	-Ø / - <i>eh</i>	- <i>ahil</i>	-Ø / - <i>eh</i>
passive	\'/ ...- <i>VI</i> /- <i>a'l</i>	\'/ ...- <i>ab</i> /- <i>a'b</i>	\'/ ...- <i>Vk</i> /- <i>a'k</i>	\'/ ...- <i>ik</i> /- <i>a'bik</i>	N/A

Inactive, inchoative, and positional stems describe different kinds of state changes without expressing their causes. Inchoative stems are derived from adjectives and, less regularly, nouns. Positionals – or “dispositionals” (Bohnemeyer & Brown 2007) – lexicalize non-inherent spatial properties that may be thought of as “manners” of location. Distinctions that enter the conceptualization of dispositions include “position”, or more generally support/suspension (e.g., *kul* ‘sit’, *wa'l* ‘stand’, *chil* ‘lie’, *xol* ‘kneel’, *nak* ‘lean’, *choh* ‘hang’, *hoch* ‘droop’); blockage of motion (e.g., *tak* ‘be stuck to something’, *kap* ‘be stuck between two things’); orientation in the gravitational field (e.g., *haw* ‘lie face up’, *nok* ‘lie face down’, *tsel* ‘lie on side’, *ch'eb* ‘be tilted’, ‘lean to one side’); and configurations of parts of an object with respect to each other (e.g., *hen* ‘be sprawled’, *nik* ‘be scattered’, *hay* ‘be spread out’, *much* ‘be in a pile’, *tsol* ‘be lined up in a row’, *sop* ‘be coiled up’). Dispositional roots require derivational morphology for the formation of both stative and intransitive dynamic stems, the latter expressing the “assume position” sense (Levin 1993). However, a majority of dispositional roots produces transitive verb stems without overt derivation. Finally, inactive roots include “path verb” roots (*bin* ‘go’, *tàal* ‘come’, *u'l* ‘return’, *máan* ‘pass’, etc.); “phase” (= aspectual) roots (e.g., *ho'p* ‘begin’, *ts'o'k* ‘end’); and also a few roots referring to bodily or cognitive state changes (e.g., *síih* ‘be born’, *kim* ‘die’, *ah* ‘wake up’, *wèen* ‘fall asleep’) and creation/destruction type events. The inactive class is fed by the anti-

causative derivation, and passivized transitive stems have a status pattern closely related to that of inactive stems (see Table 1).<sup>7</sup>

Transitive roots overwhelmingly express caused state changes (e.g., *kach* ‘break’, *xot* ‘cut’), but a few also lexicalize forced contact (e.g. *hats* ‘hit’, *koh* ‘beat’, *yet* ‘massage’) and changes in mental states in which an “experiencer” outranks the theme or stimulus (e.g., *il* ‘see’, *na’t* ‘guess’, ‘intuit’, ‘reason’, ‘understand’, and *kan* ‘learn’). All intransitive verb roots produce derived transitive stems via the causative and “applicative” derivations.

There are very few, if any,<sup>8</sup> stative verbs; meanings lexicalized in stative verbs in English, such as ‘know’, ‘love’, or ‘have’, are expressed by relational nouns and elements of other categories. Thus, the parts-of-speech system of Yucatec seems to be semantically motivated in terms of dynamicity more clearly than Indo-European languages.

Membership in the active class as opposed to the other verb stem classes is determined along the lines of the process-change distinction, not in terms of telicity, along the lines of the distinction between Vendlerian activities vs. accomplishments and achievements (as suggested by Lucy 1994). Thus, the inactive and inchoative verb stem classes include many “degree achievements” projecting atelic event descriptions unless some “degree of change” is overtly specified (Abusch 1985; Bertinetto & Squartini 1995; Dowty 1979: 88-91; Hay, Kennedy, & Levin 1999). This is illustrated in (3) for the inchoative *kàabal-tal* ‘lower’ (derived from the adjective *kàabal* ‘low’):

- (3) Le=mùunyal=o’ ts’u=chúun-ul                      u=kàabal-tal,  
 DET=cloud=D2    TERM:A3=start\ACAUS-INC    A3=low-INCH.INC  
 ‘The cloud, it had started going down (lit. lowering),’
- káa=h-tàal                      le=ìik’=o’,  
 CON=PRV-come(B3SG)    DET=wind=D2  
 ‘(when/and then) the wind came’
- káa=t-u=pul-ah                      le=mùunyal=o’.  
 CON=PRV-A3=throw-CMP(B3SG)    DET=could=D2  
 ‘(when/and then) it drove (lit. threw) the cloude away.’

<sup>7</sup> The anticausative is treated as a derivation in Bohnemeyer 2004, but is argued to have also voice-like traits in Bohnemeyer 2007.

<sup>8</sup> It is not clear that there are *any* verbs in the language that do not have at least one dynamic sense.

Ts'u=kàabal-tal le=mùunyal=o'?

TERM:A3=low-INCH.INC DET=cloud=D2

'Had the cloud gone down?'

-Ts'o'k ka'ch u=kàabal-tal káa=h-pu'l-ih.

TERM formerly A3=low-INCH.INC CON=PRV-throw\PASS-CMB(B3SG)

'It had gone down (when/and then) it was driven (lit. thrown) away.'

In (3) the speaker proposes a scenario to a native speaker consultant in which a cloud starts sinking before it is pushed away by the wind. He asks the consultant whether it is possible in this context to say that the cloud had already become lower when it was pushed away. The consultant answers in the affirmative.

Conversely, many active intransitive stems have salient telic "performance object" interpretations – especially antipassive stems such as *k'àay* 'sing' in (4):

- (4) Pedro=e' táan u=k'àay,  
 Pedro=TOP PROG A3=sing\ATP  
 'Pedro, he was singing.'

káa=t-u=k'at-ah u=báah Pablo.

CON=PRV-A3=cross-CMP(B3SG) A3=self Pablo

'(when/and then) Pablo interfered.'

Pedro=e' t-u=p'at-ah u=k'àay.

Pedro=TOP PRV-A3=leave-CMP(B3SG) A3=sing\ATP

'Pedro', he stopped singing.'

Be'òora=a' ts'o'k=wáah u=k'àay Pedro?

now=D2 TERM=ALT A3=sing\ATP Pedro

'Now, has Pedro sung?'

-Ma'h=bèey-chah u=k'àay=i'.

NEG=PRV=thus-PROC.CMP(B.3.SG) A3=sing\ATP=D4

'He didn't manage to sing (lit. his singing didn't become possible).'

In this case, the question asked of the consultant is whether somebody who is singing, but interrupted in the course of it, can be said to have sung. The consultant denies this, assuming that the singer in the scenario wasn't able to complete his song.

(3)–(4) illustrate the application of the entailment pattern known as the "imperfective paradox" (Dowty 1979: 133) in telicity tests. There are no syntactic correlates of telicity in Yucatec. There is no distinction between dura-



tion (or *for*-type) and time-frame (or *in*-type) adverbials (cf., e.g., Krifka 1992); the same verbs are used in translations of “She spent X-time VERB-ing” and “It took her X-time to VERB”; and there are no “aspectualizers” or “phase verbs” that only occur with either telic or atelic verbal cores (cf. Freed 1979).<sup>9</sup> It is not clear, at present, why telicity is reflected in the syntax of some languages but not in that of others.

### 2.3. The verb inflection system

In main clauses, the verb inflection system specifies two positions in which aspectual and modal information is obligatorily expressed: status inflection and the pre-verbal aspect-mood (AM) markers. Table 2 summarizes the distribution and semantics of the five status categories.

Table 2. Distribution and semantics of the five status categories

Category	Distribution	Semantics
completive	independent verbal cores w/ perfective AM marker	perfective aspect and “assertive” modality
incompletive	dependent verbal cores; independent verbal cores w/ imperfective AM marker	imperfective aspect and “assertive” modality
subjunctive	dependent verbal cores; optative clauses; irrealis subordinate clauses	perfective aspect and “non-assertive” modality
extra-focal	manner focus construction (dependent verbal core)	perfective aspect and “assertive” modality
imperative	imperative sentences	perfective aspect and “directive” illocution

Affirmative declarative main clauses are constituted by the combination of a verbal core with exactly one of the 15 AM markers. Two of these – the

<sup>9</sup> A verbal core is a maximal projection of a verb that dominates all of the verb’s arguments and obliques, like a subject-internal verb phrase. The term is borrowed from Van Valin & LaPolla 1997. There is no evidence of a (subject-external) verb phrase in Yucatec. Verbal cores combine with aspect-mood markers to constitute clauses in Yucatec (see below); clauses and verbal cores are thus in complementary distribution.

perfective and imperfective AM – are prefixes; the verbal cores they combine with are independent. The remaining 13 AM markers are stative predicates which take a dependent verbal core as their sole argument.<sup>10</sup> Each AM marker assigns a status category marked on the verb; Table 3 below lists the combinations.<sup>11</sup>

The semantics of the preverbal AM markers is briefly discussed below and in section 3. Relative and “topic” clauses (see section 2.5), focus constructions,<sup>12</sup> and negation involve alternative AM systems. Details vary from construction to construction (cf. Bohnemeyer 2002: 116–129); but all of these constructions are governed by what may be characterized as a realis-irrealis mood contrast, where realis mood includes reference to individual present or past events, the irrealis future time reference, and habitual and generic reference may be subsumed under either category depending on the construction. In the realis mood, depending on the construction, either the system in Table 3 or a simplified version involving bare incomplete and subjunctive forms without preverbal AM markers are used. The irrealis is expressed using a bare incomplete form under negation and the irrealis subordinator *kéen* plus subjunctive status (in some cases also incomplete, but only with intransitive verbs) in the other constructions. The examples in (5) illustrate the realis-irrealis contrast for content questions targeting the undergoer of a transitive verb. The realis example (5a) has the perfective

<sup>10</sup> There is one exception: the prospective AM marker *mukah*. *Mukah* takes an oblique dependent verbal core and carries a set-B suffix cross-referencing the actor argument if the latter is transitive and the single argument if it is intransitive. Status marking on the verb likewise depends on the verb’s transitivity (see Table 2), as it does in certain control constructions with lexical matrix predicates (see Bohnemeyer in press).

<sup>11</sup> Table 3 provides only the base forms of the AM markers; they frequently form portmanteaus with the set-A clitics of the verbal core. Necessitive *k’a’náan* has an apparent synonym *k’abéet*; some speakers use the two interchangeably, while others prefer *k’a’náan*. Other, apparently more obsolete, general necessity modals occur as well. The distinction between AM markers and lexical stative predicate that combine with dependent verbal cores is not sharply delimited. For instance, Ayres & Pfeiler (1997) and Vapnarsky (1999) treat *siúk* ‘custom’, ‘habit’ as a habitual marker, while Bohnemeyer (2002) considers *siúk* a lexical stative complement-taking predicate.

<sup>12</sup> There is evidence suggesting that all focus constructions, including all content questions, are clefts in Yucatec and that all clefts use relative clause constructions as nominal predicates; cf. Bricker (1979); Bohnemeyer (2002: 116–129); Tonhauser (2003). For an alternative viewpoint, cf. Gutiérrez Bravo (2006).

aspect marker with past time reference; the irrealis example (5b) the irrealis subordinator *kéen* and subjunctive status on the verb with future time reference:

- (5) a. Ba'x            **t-a=mèet-ah?**  
           what(B3SG) **PRV-A2=do:APP-CMP(B3SG)**  
           ‘What did you do?’, ‘What is it that you did?’
- b. Ba'x            **kéen**    a=mèet-eh?  
           what(B3SG) **SR.IRR** A2=do:APP-SUBJ(B3SG)  
           ‘What will you do/are you going to do?’, ‘What is it that you will do/are going to do?’

Table 3. Preverbal AM markers and status assignment

Subset of AM markers	AM marker	Status category
AM prefixes	perfective <i>h-(V<sub>itr</sub>)/t-</i> (V <sub>tr</sub> ) imperfective <i>k-</i>	completive incompletive
Aspectual AM predicates	progressive <i>táan</i> terminative <i>ts'o'k</i> prospective <i>mukah</i>	incompletive (V <sub>itr</sub> ) / subjunctive (V <sub>tr</sub> )
Modal AM predicates	obligative <i>yan</i> necessitive <i>k'a'náan</i> desiderative <i>táak</i> assurative <i>he' ...=e'</i> penative <i>òolak</i>	incompletive    subjunctive
Metrical AM predicates	remote future <i>bíin</i> remote past <i>úuch</i> recent past <i>sáam</i> immediate past <i>táantik ...=e'</i> proximate future <i>ta'itak</i>	   incompletive  

Finally, dependent verbal cores also occur as arguments or obliques of lexical predicates and as complements of prepositions. In these constructions, status marking is controlled by the head (cf. Bohnemeyer 2002: 91–101 for details).

It is conceivable that the presence vs. absence of an AM marker in a clause or phrase is correlated with – and thus an expression of – the semantic property of finiteness. Finiteness can be understood as the property of a clause or verbal projection of requiring a particular “topic component” for

its interpretation (Klein 2006). In languages that distinguish finite from non-finite verb forms, projections of finite verb forms must be understood as making an assertion, asking a question, etc., about a particular topic time, a particular topic place, (a) particular possible world(s), a particular set of entities, etc. In contrast, projections of nonfinite verb forms are interpreted, not with respect to their own topic components, but as part of some superordinate syntactic structure which is ultimately “hooked up” to a topic component via a finite verb form. Yucatec lacks a distinction between finite and non-finite verb forms. All verb forms are marked for status, and all status categories except for the completive occur both in independent and dependent verbal cores. It seems plausible that, in first approximation, (dependent or independent) verbal cores are inherently non-finite and that it is the combination with a preverbal AM marker that maps the “sentence base” expressed by the verbal core into a topic component. Future research will have to examine how finiteness is expressed – if at all – in focus constructions, etc., and under negation.

The semantics of the five status categories is analyzed in Bohnemeyer (2002: 216–242), with the upshot represented in Table 2. The perfective-imperfective distinction is conceptualized here following Klein 1994, i.e., in terms of a temporal relation between the time of the eventuality described in an utterance and the “topic time” for which the denotation of the utterance is computed. Perfective aspect places the event time inside the topic time; imperfective aspect conversely places the topic time inside the event time. Subjunctive status, like completive, is perfective, i.e., encodes inclusion of the event time of the verbal core in the topic time. The subjunctive differs from the completive in that it “decouples” the interpretation of the sentence or clause formed by combining the verbal core with an AM marker or a lexical matrix predicate from the realization of the event described by the verbal core (“non-assertive” modality). The subjunctive occurs as an optative mood with matrix predicates of desire. It is likewise triggered by the “penative” AM marker (from Latin *paene* “almost”), which has a counterfactual semantics and is used to describe events that almost, but not quite, become reality. The remote future and recent and remote past markers, which likewise govern the subjunctive, cardinally quantify over the distance between topic time and event time. None of these entails **event realization** (cf. Bohnemeyer & Swift 2004). The immediate, recent, and remote past markers presuppose, rather than to assert, realization of the event described by the verbal core. Hence, when they are negated, it is to deny the recency/remoteness of the event described by the verbal core – not that the event happened:

- (6) Ma' sáam sùunak le=kòombi=o';...  
 NEG REC turn\ATP:SUBJ(B3SG) DET=van=D2  
 'It's not a while ago that the bus returned;...'
- a. ...inw=a'l-ik=e', h-ts'o'k mèedya òora.  
 A1SG=say-INC(B3SG)=TOP PRV-end(B3SG) half hour  
 '...I think it was half an hour ago.'<sup>13</sup>
- b. ??...tuméen ma' sùunak=i'.  
 CAUSE NEG turn\ATP:SUBJ(B3SG)=D4  
 '...because it hasn't returned yet.'

Presupposition may also motivate the occurrence of the bare subjunctive in certain focus constructions (including the so-called “agent-focus” form) with perfective reference. The irrealis subordinator *kéen* illustrated above likewise assigns subjunctive status.

“Extra-focal” is a status category exclusively reserved to a particular kind of focus constructions: manner focus constructions, in which the focused element refers to a property of the event described by the “extra-focal” subordinate clause. If that clause is perfective, its verb is in the extra-focal. Example (7) illustrates:

- (7) Domiingo-ak=e' ma'+lo'b h-hàats'-nahik-en.  
 Sunday-CAL=TOP NEG+bad PRV-hit\ATP-EXTRAFOC-B1SG  
 'Last Sunday, well is how I batted.'

Imperative forms are used exclusively in commands. They do not combine with preverbal AM markers, and the set-A prefixes cross-referencing the addressee as the single argument of intransitive imperatives and the A-argument of transitive imperatives is deleted.

Turning to the AM markers, the semantics of the five aspectual AM markers is sketched in Figure 1. The analysis presupposes the framework of Klein 1994, with one modification: prospective and perfect are understood as placing topic time in the run time of some pre- or post-state causally related to the target event, rather than merely in *times* preceding and following the event, respectively. The imperfective AM marker has progressive

<sup>13</sup> The recent past marker is a “same day” past marker, i.e., is used for events that happened earlier on the day that includes topic time. By preemption, it receives a non-immediacy implicature due to its contrast with the immediate past marker. This implicature is interpreted in (6b) as metalinguistically negated.

interpretations mostly in focus constructions. Outside focus constructions, it occurs in irrealis contexts, i.e., in clauses with habitual, generic, and future time reference whose subordinate counterparts trigger irrealis marking in the appropriate syntactic environments. Only the progressive reading is represented in Figure 1. The perfective AM marker has both perfective interpretations proper and (resultative) perfect interpretations; Bohnemeyer (2002: 246–250) argues that this is a case of vagueness. The question whether the perfective marker incorporates a past tense component is discussed in section 3.

Four of the five modal AM markers involve universal quantification over the possible worlds in “modal bases” (Kratzer 1977, 1981, 1991) of different kinds. The obligative is used to express that the sentence base eventuality is realized in all worlds consistent with the social obligations of the referent of the S/A argument, with schedules, and with the ordinary course of events in general. The desiderative AM marker indicates that the base eventuality is realized in all possible worlds in which the (in particular, bodily) desires of the referent of the S/A argument are met. The assurative AM is used for universal quantification over a modal base in which promises, offers, and commitments by the referent of the S/A argument are fulfilled; in these uses, it conveys a certain illocutionary flavor. But the assurative is also used with epistemic modal bases. In this case, it expresses certainty; but, perhaps due to the contrast with the obligative and prospective markers – both of which are used for reference to events expected to occur in “inertia worlds” (Dowty 1979; Landman 1992; Portner 1998), based on evidence of causally related pre-states that obtain in the topic situation – epistemic uses of the assurative tend to have a strong flavor of subjective opinion or estimate. The fourth universal-force modal, the necessitive, is used to express circumstantial or conditional necessity – the idea that something must happen if something else is to be allowed to happen or to be avoided.<sup>14</sup>

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<sup>14</sup> While there are thus four universal-force modals integrated into the paradigm of AM markers, existential modality – i.e., possibility – is expressed by inflected lexical predicates. The reason for this curious asymmetry is unknown.

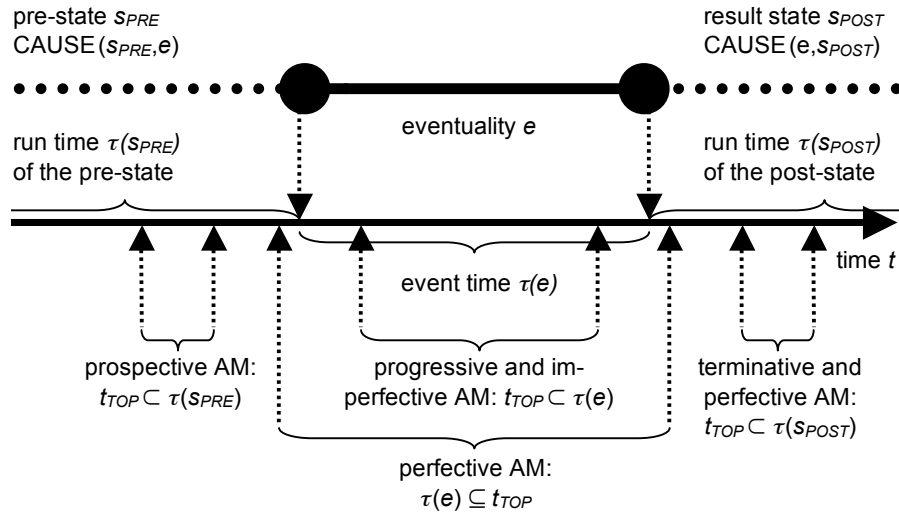


Figure 1. Semantics of the aspectual AM markers (key:  $CAUSE(a,b)$  – event  $a$  is/was/will be the/a cause of event  $b$ ;  $S_{PRE}$  – pre-state;  $S_{POST}$  – result-state;  $\tau(a)$  – run time of  $a$ ;  $t_{TOP}$  – topic time)

The “penative” AM marker *òolak* is used to indicate that an instance of the base event was at some past topic time about to happen, but subsequently did not – a purely counterfactual sense of “almost”. It can be viewed as a counterfactual mirror image of the prospective and proximate-future markers. Its grouping with the four universal-force modals is obviously somewhat arbitrary; it does not perfectly fit into any of the subcategories of AM markers distinguished here.

The five metrical AM predicates quantify the distance between the run time of the base eventuality and topic time. The denotation of proximity in the proximate future marker (how soon is “soon”?) is purely a matter of contextual standards. The rare remote future marker seems to be primarily used to convey negation of this subjective sense of proximity. Consultants consistently volunteer the information that the remote future suggests that the speaker has no idea when, if at all, the base event will happen.<sup>15</sup> The

<sup>15</sup> The remote future marker was mischaracterized as a “predictive” modal marker in Bohnemeyer (1998b, 2000a, 2002, 2003). The research on which this body of work was based did not produce evidence of the marker. The conjecture of modal semantics took off from the observation that the marker is associated with the genre of prophecies (Vapnarsky 1995). However, recent elicitation has shown it to be part of the “degrees-of-remoteness” system. See section 3 for examples.

three metrical past markers form a scale<sup>16</sup> the central member of which, the recent past marker *sáam*, prototypically extends into the relative past up to the boundary between the day that includes topic time and the preceding day, i.e., functions as a “hodiernal past” marker.<sup>17</sup> By preemption, the immediate and remote past markers are interpreted to the exclusion of the recent past marker. In the case of the immediate past marker *táantik ...=e*, this has the effect that the latter is used predominantly for events that happened at a distance which is short compared to the lengths of a day (no more than a few hours, and often less than an hour), while the remote past marker *íuch* is used at a distance considered long by the same standard (typically several days ago).

The five metrical distance predicates differ in several ways from “metrical tense” phenomena described in the literature (e.g., Comrie 1985: ch.4; Dahl 1984, 1985: 120–128). It is argued in section 3 that instead of constraining possible topic times of the utterance vis-à-vis coding time or some reference point, as true (metrical) tenses would, they express the distance between topic time and event time as a state that obtains at topic time.

#### 2.4. Adverbials

Within the domain of temporality, adverbials are used to express calendrical or clock time indices or the event times of eventualities. There is a handful of lexical indexical adverbs, including terms locating days with respect to coding time (e.g., *ka'ho'lheak* ‘the day before yesterday’, *sáamal* ‘tomorrow’) and the “topic time shifters” *be'òora ...=a'/=e* ‘now’ and *ka'ach(il)* ‘formerly’. The latter are briefly discussed in section 3. Apart from these, temporal adverbials are mostly headed by spatial prepositions such as *ich(il)* ‘in’, ‘inside’ and relational nouns such as *táan* ‘front’. These adverbials specify time intervals, but do not encode temporal ordering relations between these times and the topic or event time of the utterance. Thus, *ich(il ti) ts'e'ets'ek k'ìin* may be used to translate ‘in a few days’ (referring to an

<sup>16</sup> This is not an entailment scale in the sense of Horn 1972 since the three terms denote distances from topic time and thus entail upper bounds. The markers’ interpretation is nonetheless subject to pragmatic enrichment, as mentioned below.

<sup>17</sup> This cut-off point is blurred by the frequent use of *sáam* to express that something happened earlier than expected (by the speaker and/or the addressee), even if it happened within the domain of the immediate or remote past. See also section 3.



event in the (relative) future), ‘((with)in a few days’ (referring to a time span within which some event was or will be completed), ‘for a few days’ (referring to the duration of a process or interval), or ‘a few days ago’, depending on aspect-mood marking.

- (8) Pwes to’n=e’,            **ich ts’e’ts’ek k’iin** hóok’-ok-o’n.  
 well PREP:B1PL=TOP **in a.few sun** exit-SUBJ-B1PL  
 ‘Well, as for us, it was a few days ago that we left.’
- (9) Pwes to’n=e’,            **ich ts’e’ts’ek k’iin** kéen hóok’-ok-o’n.  
 well PREP:B1PL=TOP **in a.few sun** SR.IRR exit-SUBJ-B1PL  
 ‘Well, as for us, it is in a few days that we will leave.’

Bohnenmeyer (in press) suggests that this may be a reflex of the literal spatial meanings of the heads, which encode what Jackendoff 1983 calls “place functions”, but no locative or path relations. For instance, *ich le=nah=o’*, formed with the same preposition *ich*, translates ‘in the house’, ‘into the house’, ‘out of the house’, and ‘through the house’, depending on the verb the phrase combines with.

## 2.5. Connectives

As in other languages, subordinate clauses may serve to introduce the time of the event they describe as a point of reference in discourse. There are, however, no connectives in Yucatec that encode ordering relations between time intervals such as ‘after’, ‘before’, or ‘while’. There is likewise no word for ‘when’, although there are a few idioms that serve as temporal anaphors without expressing ordering relations. An example is the phrase *chéen ya’lo’* ‘at that time’, literally ‘it will say that’ in (10), using a form of the irrealis subordinator *kéen*:

- (10) Chéen ka’=sùunak-ech            t-u=láak’            ha’b=e’,  
 SR:IRR REP=turn\ATP:SUBJ-B2SG PREP-A3=other year=TOP  
**chéen y=a’l-Ø=e’**,  
**SR:IRR A3=say-SUBJ(B3SG)=TOP**  
 táantik in=mèet-ik            le=nah=o’.  
 IMM A1SG=DO:APP-INC(B3SG) DET=house=D2  
 ‘(When) you return here next year, at that time (lit. (when) it will say that), I will have just build the house.’

The first clause in (10), *chéen ka' sùunakech tuláak' ha'be'* '(when) you return next year', introduces a reference point taken up first by the phrase that functions as a temporal anaphor (itself a clause) – which is actually redundant in this example – and then by the main clause, whose topic time it is understood to mark. These subordinate clauses determine the topic time for the main clause much like temporal clauses in Indo-European languages. However, syntactically, they are not adverbials, but share the morphological and ordering properties of left-dislocated arguments – they are “topic clauses” (Bohnemeyer 1999c). Neither the clause that introduces the reference time nor the phrase *chéen ya'lo'* are morphologically “flagged” for expressing temporal reference points. They are marked as topics by their position and the clause-final particle that follows them (the topic marker =*e'* in (10)); but in an appropriate context, the same clauses could be interpreted as headless relative clauses. This ambiguity is illustrated in (11):

- (11) **Le=k-u=tàas-a'l=e'**, **k-u=bo'l-t-a'l.**  
**DET=IMPF-A3=come:CAUS-PASS.INC=TOP** IMPF-A3=pay-APP-PASS.INC  
 '(What) is brought is paid for / (when) it is brought, it is paid for.'  
 (based on Blair & Vermont Salas 1965–67 11.1.25)

Instead of connectives expressing ordering relations, both “topic clauses” of the kind illustrated in (10)–(11) and main clauses frequently carry what may be described as “aspectual connectives” (Bohnemeyer 1998b: 485–503). An example is *káa*, which occurs exclusively with the perfective AM marker. The perfective AM marker has both perfective and result-state interpretations (e.g., the same clause can be used to convey ‘The car broke down’ and ‘The car is broken down’, not unlike the simple past in English). *Káa* forces the perfective interpretation. Result-state reference, like all notional viewpoint aspects except for the perfective, requires a contextual reference point (a “natural temporal reference point”, see section 4) to determine its topic time. *Káa* blocks interpretation of the clause with respect to a tracked topic time. Put differently, it signals “resetting” of the topic time variable. This device is used above all in narrative discourse. The result can be a sequential or simultaneous interpretation depending on context. In (12), the preferred interpretation is sequential. The order of events is inferred from the order of clauses on the basis of stereotype implicatures in this case (see section 4). In (13), the preferred interpretation is simultaneous for most speakers because the two actions reported have different agents. This makes it clear that *káa* does not express an ordering relation.

- (12) Pedro=e' **káa**=t-u=ts'íib-t-ah hun-p'éel  
 Pedro=TOP CON=PRV-A3=write-APP-CMP(B3SG) one-CL.IN  
 kàarta=e', **káa**=t-u=ts'u'uts'-ah hun-p'éel chamal  
 letter=TOP CON=PRV-A3=suck-CMP(B3SG) one-CL.IN cigarette  
 'Pedro, (when) he wrote a letter, he smoked a cigarette'  
 (preferred interpretation sequential)
- (13) **Káa**=t-u=ts'íib-t-ah hun-p'éel kàarta Pedro=e',  
 CON=PRV-A3=write-APP-CMP(B3SG) one-CL.IN letter Pedro=TOP  
 Juán=e', **káa**=t-u=ts'u'uts'-ah hun-p'éel chamal  
 Juán=TOP CON=PRV-A3=suck-CMP(B3SG) one-CL.IN cigarette  
 '(When) Pedro wrote a letter, Juán smoked a cigarette'  
 (preferred interpretation for most consultants simultaneous)

In (12)–(13), the topic clauses refer to the times of the events they describe. The topic times of the main clauses are interpreted with respect to these event times, though not necessarily as coinciding with them, since the main clauses likewise contain the “topic time reset” connective *káa*. The results are the observed interpretations. It is also possible for topic clauses to refer to times before or after the event they describe. Aspectual and modal expressions are used for this purpose. Example (14) shows a topic clause that sets a topic time for the main clause preceding the topic clause event, the speaker's arrival:

- (14) Ma' k'uch-uk-en=e', káa=h-hóok' leti'  
 NEG arrive-SUBJ-B1SG=TOP CON=PRV-exit(B3SG) DET:PREP  
 '(When) I had not yet arrived, (and) she left'

The topic clause in this case uses negation and subjunctive status to refer to a time prior to the realization of the topic clause event. This construction is the closest Yucatec equivalent of the English connective *before*.

This section has provided an overview of the various types of lexical and morphosyntactic resources involved in the expression of temporality in Yucatec. The following sections summarize the evidence for tenselessness (section 3) and offer an account of temporal anaphora in Yucatec (section 4).

### 3. Tenselessness

Yucatec is a tenseless language in the sense that the morphosyntactic form of the clause does not constrain its use with topic times in the present, past, or future of coding time (absolute = deictic tense) or some other reference point (relative = anaphoric tense). “Morphosyntactic form” is taken here to mean syntactic structure plus/including inflection. To demonstrate tenselessness, it needs to be shown that any Yucatec clause regardless of syntactic structure and inflection is compatible with both topic times in the present, past, and future of coding time and topic times in the present, past, and future of some other reference point. The discussion in the present chapter focuses on clauses that can constitute sentences by themselves (“main” or “independent” clauses). Subordinate clauses are briefly taken up at the end of this section. The syntactic variation that needs to be taken into account when evaluating the claim of tenselessness for main/independent clauses is primarily the selection of the preverbal “aspect-mood” (AM) marker. As mentioned in the previous section, the “status” suffix on the verb is determined by the AM marker. The examples in (15) illustrate the 15 AM markers.

- (15) a. *Perfective AM – completive status*  
**T**-in=mèet-**ah**   le=nah=o’  
**PRV**-A1SG=do:APP-**CMP**(B3SG)   DET=house=D2  
 ‘I built the house’
- b. *Imperfective AM – incompletive status*  
**K**-in=mèet-**ik**   le=nah=o’  
**IMPF**-A1SG=do:APP-**INC**(B3SG)   DET=house=D2  
 ‘I (would) build the house’
- c. *Terminative AM – incompletive status*  
**Ts’o’k** in=mèet-**ik**   le=nah=o’  
**TERM**   A1SG=do:APP-**INC**(B3SG)   DET=house=D2  
 ‘I (will) have/had built the house’
- d. *Progressive AM – incompletive status*  
**Táan** in=mèet-**ik**   le=nah=o’  
**PROG**   A1SG=do:APP-**INC**(B3SG)   DET=house=D2  
 ‘I am/was/will be building the house’

- e. *Prospective AM – subjunctive status on transitive verbs, incomplete on intransitive verbs*

**Mukah** in=mèet-Ø le=nah=o'  
**PROSP** A1SG=do:APP-SUBJ(B3SG) DET=house=D2  
 'I am/was/will be going to build the house'

- f. *Necessitive AM – incompletive status*

**K'a'náan** in=mèet-ik le=nah=o'  
**NEC** A1SG=do:APP-INC(B3SG) DET=house=D2  
 'I must/had to/will have to build the house'

- g. *Obligative AM – incompletive status*

**Yan** in=mèet-ik le=nah=o'  
**OBL** A1SG=do:APP-INC(B3SG) DET=house=D2  
 'I (will) have/had to build the house'

- h. *Assurative AM – incompletive status*

**He'** in=mèet-ik le=naho'  
**ASS** A1SG=do:APP-INC(B3SG) DET=house=D2  
 'I will/would indeed (agree to) build the house (you shall see)'

- i. *Desiderative AM – incompletive status*

**Táak** in=mèet-ik le=nah=o'  
**DES** A1SG=do:APP-INC(B3SG) DET=house=D2  
 'I (will) want(ed) to build the house'

- j. *Penative AM – subjunctive status*

**Òolak** in=mèet-Ø le=nah=o'  
**PEN** A1SG=do:APP-SUBJ(B3SG) DET=house=D2  
 'I (will have/had) almost built the house'

- k. *Remote future AM – subjunctive status*

**Bíin** in=mèet-Ø le=nah=o'  
**REMF** A1SG=do:APP-SUBJ(B3SG) DET=house=D2  
 'It is/was/will be a long time before I build the house'

- l. *Proximate future AM – incompletive status*

**Ta'itak** in=mèet-ik le=nah=o'  
**PROX** A1SG=do:APP-INC(B3SG) DET=house=D2  
 'I will/would soon build the house'

- m. *Immediate past AM – incompletive status*

**Tántik** in=mèet-ik le=nah=o'  
**IMM** A1SG=do:APP-INC(B3SG) DET=house=D2  
 'I (had/will have) just built the house'

n. *Recent past AM – subjunctive status*

**Sáam** in=mèet-Ø le=nah=o'  
**REC** A1SG=do:APP-SUBJ(B3SG) DET=house=D2  
 'I (had/will have) built the house already/not long ago'

o. *Remote past AM – subjunctive status*

**Úuch** in=mèet-Ø le=nah=o'  
**REMP** A1SG=do:APP-SUBJ(B3SG) DET=house=D2  
 'I (had/will have) built the house long ago'

The 15 examples can be used, with the exceptions to be discussed below, in each of the following three contexts in the position marked “\_\_\_\_\_”. Each context determines the topic time of the utterance following it in the position marked “\_\_\_\_\_”. In (16), Jorge is asking Pedro whether he has built the house he had been planning to build. This question introduces a time frame starting with Jorge’s last visit two years earlier and leading up to the present of the utterance. In (17), Jorge asks whether Pedro will build the house in the future, and Pedro begins his response by shifting the topic time to Jorge’s next visit a year into the future. In the final context, (18), Jorge asks whether Pedro’s house is new, and Pedro sets the topic time of his response to the time of Jorge’s last visit two years earlier.

(16) *Diagnostic context: topic time leading up to utterance time*

Jorge’ táantik u=k’uch-ul x-Yaxley.  
 Jorge:TOP IMM A3=arrive-INC F-Yaxley  
 ‘Jorge, he has just arrived in (the village of) Yaxley.’  
 H-ts’o’k ka’-péel ha’b káa=h-sùunah  
 PRV-end(B3SG) two-CL.IN year CON=PRV-turn:cmp(B3SG)  
 ‘It has been two years since he returned...’  
 t-u=kàah-al=o’.  
 PREP-A3=reside\ATP-REL=D2  
 ‘...to his country.’  
 T-uy=ohel-t-ah  
 PRV-A3=knowledge-APP-CMP(B3SG)  
 ‘He knew...’  
 táak u=mèet-ik u=nah-il Pedro.  
 DES A3=do:APP-INC(B3SG) A3=house-REL Pedro  
 ‘...that Pedro wanted to build a (lit. his) house.’

Ba'x=e' ma' t-uy=ohel-t-ah  
 what=TOP NEG PRV-A3=knowledge-APP-CMP(B3SG)  
 'But he didn't know...'  
 wáah h-bèey-chah-ih.  
 ALT PRV-thus-INCH.CMP-CMP(B3SG)  
 '...whether he was able to do it (lit. whether it became possible).'  
 Káa=t-uy=il-ah Pedro te=kàaye=o',  
 CON=PRV-A3=see-CMP(B3SG) Pedro PREP:DET=street=D2  
 'He saw Pedro in the street.'  
 káa=t-u=k'áat+chi'-t-ah.  
 CON=PRV-A3=wish+mouth-APP-CMP(B3SG)  
 'and he asked him.'  
 Káa=t-u=núuk-ah Pedro=e':  
 CON=PRV-A3=answer-CMP(B3SG) Pedro=TOP  
 'Pedro answered:'  
 “ \_\_\_\_\_ ”

(17) *Diagnostic context: topic time in the future of utterance time*

Jorge' ta'itak u=sùut t-u=kàah-al=o'.  
 Jorge:TOP IMM A3=turn\ATP PREP-A3=reside\ATP-REL=D2  
 'Jorge, he would soon return to his country.'  
 T-uy=ohel-t-ah  
 PRV-A3=knowledge-APP-CMP(B3SG)  
 'He knew...'  
 táak u=mèet-ik u=nah-il Pedro.  
 DES A3=do:APP-INC(B3SG) A3=house-REL Pedro  
 '...that Pedro wanted to build a (lit. his) house.'  
 Ba'x=e' ma' t-uy=ohel-t-ah  
 what=TOP NEG PRV-A3=knowledge-APP-CMP(B3SG)  
 'But he didn't know...'  
 wáah yan u=bèey-tal.  
 ALT OBL A3=thus-INCH.INC  
 '...whether he would be able to do it (lit. whether it would become possible).'  
 Káa=t-uy=il-ah Pedro te=kàaye=o',  
 CON=PRV-A3=see-CMP(B3SG) Pedro PREP:DET=street=D2  
 'He saw Pedro in the street.'

káa=t-u=k'áat+chi'-t-ah.

CON=PRV-A3=wish+mouth-APP-CMP(B3SG)

'and he asked him.'

Káa=t-u=núuk-ah

Pedro=e':

CON=PRV-A3=answer-CMP(B3SG) Pedro=TOP

'Pedro answered:'

"Chéen ka'=sùunak-ech t-u=láak' ha'b=e',

SR:IRR REP=turn\ATP:SUBJ-B2SG PREP-A3=other year=TOP

'When you return next (lit. the other) year,...

"

(18) *Diagnostic context: topic time in the past of utterance time*

Jorge', t-uy=ohel-t-ah

Jorge=TOP PRV-A3=knowledge-APP-CMP(B3SG)

'Jorge, he learned...'

t-u=mèet-ah

u=nah-il

Pedro.

PRV-A3=do:APP-CMP(B3SG) A3=house-REL Pedro

'...that Pedro had built a (lit. his) house.'

káa=t-u=k'áat+chi'-t-ah

CON=PRV-A3=wish+mouth-APP-CMP(B3SG)

'He asked him...'

wáh túumben le=nah=o'.

ALT new(B3SG) DET=house=D2

'...whether the house was new.'

Káa=t-u=núuk-ah

Pedro=e':

CON=PRV-A3=answer-CMP(B3SG) Pedro=TOP

'Pedro answered:'

"Káa=h-tàal-ech way h-ts'o'k ka'=p'éel ha'b=e',

CON=PRV-come-B2SG here PRV-end(B3SG) two=CL.IN year=D3

'When you came here two years ago,...

"

Most of the utterances in (15) are readily interpretable in these three contexts. For illustration, (19) has the remote past AM marker with future time reference and (20) the remote future AM marker with past time reference:



- (19) Chéen ka'=sùunak-ech t-u=láak' ha'b=e',  
 SR:IRR REP=turn\ATP:SUBJ-B2SG PREP-A3=other year=TOP  
**úuch** in=mèet-Ø le=nah=o'  
**REMP** A1SG=do:APP-SUBJ(B3SG) DET=house=D2  
 'When you return next (lit. the other) year, I will have built the house long ago'
- (20) Káa=h-tàal-ech way h-ts'o'k ka'=p'éel ha'b=e',  
 CON=PRV-come-B2SG here PRV-end(B3SG) two=CL.IN year=D3  
**bíin** in=mèet-Ø le=nah=o'  
**REMF** A1SG=do:APP-SUBJ(B3SG) DET=house=D2  
 'When you came here two years ago, it was going to be a long time before I would build the house'

However, there are a number of principled exceptions. First of all, there are pragmatic issues that may affect the naturalness of various markers in these contexts.<sup>18</sup> Secondly, the imperfective aspect marker (15b) has a progressive meaning in focus constructions, but outside those is compatible with all and only those topic times that in subordinate clauses trigger irrealis marking (see section 2.3): habitual, generic, and future topic times. It is thus anomalous in descriptions of the building of an individual house in present (16) and past contexts (18), but is interpretable in the future time reference context of (17). Finally, and most significantly for present purposes, the perfective (15a) and “penative” (counterfactual) AM markers (15j) are incompatible with future time reference. The most straightforward explanation of this restriction would be that the markers have past (or non-future; the perfective is compatible with blow-by-blow-reporting-style contexts) meaning components. However, the perfective AM marker is in fact used with future time reference in conditional antecedents:

<sup>18</sup> It is of course difficult to find a single example sentence format such that all 15 markers are equally natural in this format in all three contexts. The recent past marker (15n) is considered infelicitous by some consultants in all three contexts because it is commonly used to indicate that the target event happened/was realized earlier than expected/hoped/feared etc. This presupposition makes no sense in the contexts in (16)–(18). Most of the modal markers are more likely to be accepted with topic times shifted into the past or future of utterance time when occurring in the complement of a verb of cognition or a speech act verb or the like. The perfective AM marker is used for both perfective and result state reference. In the narrative context (18), the connective *káa* is preferred to be added at the left edge of (15a) to force the perfective interpretation.

- (21) a. Wáah **t-a=ts'o'k-s-ah** le=nah  
 ALT **PRV-A2=end-CAUS-CMP(B3SG)** DET=house  
 te=mèes k-u=tàal=o',  
 PREP:DET=month IMPF-A3=come=D2  
 hi'n=bo'l-t-ik tèech be'òora=a'.  
 ASS:A1SG=pay-APP-INC(B3SG) PREP:B2SG now=D1  
 'If you build the house next month, I will pay you now.'
- b. Wáah **káa=ts'o'k-s-Ø** le=nah  
 ALT **SR:A2=end-CAUS-SUBJ(B3SG)** DET=house  
 te=mèes k-u=tàal=o',  
 PREP:DET=month IMPF-A3=come=D2  
 hi'n=bo'l-t-ik tèech be'òora=a'.  
 ASS:A1SG=pay-APP-INC(B3SG) PREP:B2SG now=D1  
 'If you build the house next month, I will pay you now.'

In (21), a hypothetical conditional is used to offer the addressee a deal. For this purpose, either the perfective (a) or the subordinator *káa* in combination with subjunctive status (b) can be used without discernible semantic difference. Notice that the perfective does not convey relative past time reference in (21) either: the reference point for an anaphoric-tense interpretation would have to be the event time of the main clause, which however lies in the relative past, not future, of the topic time of the conditional clause in (21). If the semantic contribution of the perfective in conditionals such as (21a) is compositional, then the perfective cannot have a (deictic or anaphoric) past tense semantics.

The perfective AM marker occurs with future time reference in conditional antecedents, but not in any clause that asserts, questions, or presupposes propositions. I have argued (Bohnemeyer 1998b, 2000a, 2002) that this is due to a combination of the fact that the perfective marker entails event realization (Bohnemeyer & Swift 2004), i.e., factuality, with a principle that bars treating the realization of future events as fact:

(22) **Modal commitment constraint (MCC)**

The realization of events in the (relative or absolute) future cannot be asserted, denied, questioned, or presupposed as fact. Assertions, questions, and presuppositions regarding the future realization of events, or the failure thereof, require specification of a modal attitude on the part of the speaker.

The MCC requires clauses used to assert, deny, question, or presuppose realization of future events to express a modal attitude towards the realization of the event: necessity, desire, agreement, prediction, etc. Since the modal markers that express these attitudes cannot co-occur with the perfective AM marker in the same clause, the perfective is excluded from the relevant contexts by the MCC. The MCC is a language-specific constraint. However, similar principles have been reported for other tenseless languages (Comrie 1985: 50–53 for Burmese and Dyirbal; Bittner 2005 for Kalaallisut/West Greenlandic).

The MCC accounts the unavailability of the “penative”, i.e., counterfactual, AM marker with future time reference since this marker negates realization of the target event. But why does the MCC not exclude the terminative aspect marker and the immediate, recent, and remote past markers from occurring with future time reference? All of these markers entail realization of the event described by the verbal core. However, these markers have stative meanings: they serve to assert, deny, or question, not the realization of the target event, but the result state of the target event (terminative AM) or the state of the target event’s immediacy (immediate past AM), recency (recent past AM), or remoteness (remote past AM). Stativity of these markers is evident from their incompatibility with event time adverbials. This is illustrated for the terminative AM marker in (23). The adverbial *ho’lheak* ‘yesterday’ can only be interpreted as a topic time adverbial in (23a), rendering the sentence both pragmatically (the speaker is asking whether the addressee was during the day before the utterance in the state of having met their brother) and syntactically odd (topic time adverbials are preferred to be left-dislocated). To obtain the event time interpretation (i.e., to ask whether the addressee met the speaker’s brother the day before the utterance), the perfective AM marker is used, as in (23b):

- (23) a. ?Ts’o’k aw=il-ik in=suku’n ho’lheak?  
 TERM A2=see-CMP(B3SG) A1SG=older.brother yesterday  
 ‘Had you met my brother yesterday?’
- b. T-aw=il-ah in=suku’n ho’lheak, he’bix  
 PRV-A2=see-CMP(B3SG) A1SG=older.brother yesterday like  
 t-a=tukul-ah=e’?  
 PRV-A2=think-CMP(B3SG)=D3  
 ‘Did you meet my brother yesterday, as you had planned?’

Incompatibility with event time adverbials can be established in the same fashion for the immediate, recent, and remote past AM markers. This incom-

patibility suggests that it is only the result state of the event in the case of the terminative marker and the state of the event having occurred at a certain distance from topic time in the case of the metrical tense markers that is accessible to adverbial modification. And it is the stativity of the markers in question that explains why they are not barred from future topic times by the MCC. All stative predicates of Yucatec occur freely with arbitrary topic times – the MCC does not apply to state descriptions:

- (24) (Káa=h-tàal-ech        way h-ts'o'k        ka'=p'éel ha'b=e',  
 CON=PRV-come-B2SG here PRV-end(B3SG) two=CL.IN year=D3  
 /chéen ka'=sùunak-ech        t-u=láak'        ha'b=e',)  
 SR:IRR REP=turn\ATP:SUBJ-B2SG PREP-A3=other year=TOP  
 túumben le=nah=o'  
 new(B3SG) DET=house=D2  
 '(When you came here two years ago/when you return next (lit. the other) year,) the house is/was/will be new'

The rationale behind this dichotomy in the grammatical treatment of propositions that concern the realization of events and propositions about states deserves further attention.

The case against an anaphoric-tense analysis of the Yucatec AM markers rests on Occam's Razor: the semantic contribution of a given marker in a given utterance can be either relative tense or some modal or aspectual meaning, but should not be assumed to be both except in the face of compelling evidence. Given this principle, the relative tense analysis of a marker is defeated by demonstrating aspectual or modal meaning components. Such meaning components are established on the basis of failure to entail event realization (this applies to all modal AM markers, the imperfective, progressive, and prospective aspect markers, and the remote and immediate future markers) or incompatibility with event time adverbials (this applies to the terminative aspect marker and the five AM markers expressing degrees of remoteness). The examples in (25)–(26) illustrate failure to entail event realization for the progressive (25) and obligative (26) AM markers:

- (25) Káa=h-tàal-ech        way h-ts'o'k        ka'=p'éel ha'b=e',  
 CON=PRV-come-B2SG here PRV-end(B3SG) two=CL.IN year=D3  
**táan** in=mèet-ik        le=nah=o'.  
**PROG** A1SG=do:APP-INC(B3SG) DET=house=D2  
 Ba'x=e'    ma' h-bèey=chah  
 what=TOP NEG PRV-thus=INCH.CMP(B3SG)=D4

in=ts'o'k-s-ik tuméen h-k'oha'n-chah-en.  
 A1SG=end-CAUS-INC(B3SG) CAUSE PRV-sick-INCH.CMP-B1SG  
 'When you came here two years ago, I was building the house. But, I wasn't able to finish it because I became ill.'

- (26) Káa=h-tàal-ech way h-ts'o'k ka'=p'éel ha'b=e',  
 CON=PRV-come-B2SG here PRV-end(B3SG) two=CL.IN year=D3  
**yan** in=mèet-ik ka'ch le=nah=o'.  
 OBL A1SG=do:APP-INC(B3SG) formerly DET=house=D2  
 Ba'x=e' ma' h-bèey=chah=i',  
 what=TOP NEG PRV-thus=INCH.CMP(B3SG)=D4  
 tuméen h-k'oha'n-chah-en.  
 CAUSE PRV-sick-INCH.CMP-B1SG  
 'When you came here two years ago, I had to build the house. But, it didn't work out because I became ill.'

Incompatibility with event time adverbials has been exemplified for the terminative AM marker in (23). The remote future marker has both diagnostic properties: it fails to entail event realization (27) and is incompatible with event time adverbials (28).

- (27) **Biin** in=mèet-Ø le=nah=o', ba'x=e', ma'  
 REMF A1SG=do:APP-SUBJ(B3SG) DET=house=D2 what=TOP NEG  
 inw=ohel wáah yan u=bèey-tal.  
 A1SG=knowledge(B3SG) ALT OBL A3=thus-INCH.INC  
 'It will be a long time before I build the house, but I don't know whether it will be possible.'

- (28) \***Biin** in=mèet-Ø le=nah  
 REMF A1SG=do:APP-SUBJ(B3SG) DET=house  
 te=àanyo k-u=tàal=o'.  
 PREP=year IMPF-A3=come=D2  
 intended: 'I will build the house next year.'

The AM markers of temporal distance deserve special attention in the context of the tenselessness analysis. As mentioned in section 2, these differ from better studied "metrical tense" systems (cf., e.g., Comrie 1985: ch.4; Dahl 1984, 1985: 120–128) in a number of respects. Most importantly, as demonstrated here, they do not encode absolute tense. Neither is their use

obligatory for reference to an event at the specified distance from topic time – they are used to emphasize the degree of remoteness much the same way adverbials such as *recently* and *a long time ago* are in English. They could be analyzed as optional anaphoric/relative metrical tenses. However, as shown above, they are stative predicates that do not permit event time specifications. Instead of specifying the distance between topic time and coding time, as absolute metrical tenses would, or the distance between topic time and some reference point, as relative metrical tenses would, they specify the distance between topic time and the time of the event described by the verbal core. They are thus not tenses in the sense of the definition given in the beginning of this section: they do not constrain the topic time of the utterance vis-à-vis coding time or some other reference point. Instead, their semantics concerns the relation between topic time and event time, much like that of the aspectual and modal AM markers.

Subordinate clauses and verbal cores can be divided into three classes: (a) embedded verbal cores which occur as complements of matrix predicates or adpositions – these are interpreted with respect to the topic time of the matrix; (b) subordinate clauses which show the same aspect-mood marking system as independent clauses – these are thus subject to the same argumentation advanced above for independent clauses; and (c) subordinate clauses that show the reduced AM-marking systems briefly discussed in section 2.3. As mentioned, these reduced systems are all governed by a realis-irrealis mood contrast. In this case, the fact that the same irrealis form used for (absolute and relative) future time reference is also used for habitual and generic reference makes a tense analysis implausible from the start.

Yucatec does, of course, have means of explicitly constraining the topic time of an utterance. Adverbials and subordinate clauses as illustrated in most of the examples in this section will do the job just fine. This includes two adverbs whose semantics is similar if not identical to that of present and past tenses, respectively: the “topic time shifters” *be’òora ...=a’* ‘now’, which restricts topic time to overlap with coding time, and *ka’ch(il)* ‘formerly’, which situates topic time in the past of utterance time. The latter is illustrated in the second line of (26) above. These are not considered tenses here because they are clearly not required by the morphosyntactic form of the sentence – they are just adverbs that optionally occur in the same positions as a host of other adverbs. As a result, their pragmatics is also quite different from that of tense marking in Indo-European languages. However, it seems quite possible that *optional* tense markers in languages that have them function similarly to the Yucatec topic time shifters. *Be’òora ...=a’* ‘now’ is predominantly used to implicate that a state asserted to hold at

topic time did not hold at some relevant earlier time, and *ka'ch(il)* triggers the inverse implicature that the state asserted to hold at topic time does not hold any longer at coding time. For example, in (26), *ka'ch(il)* is used to indicate that the state of “obligation” to build the house no longer holds at utterance time. Of course, tense marking in English carries the same implicatures; the difference is that the Yucatec topic time shifters are used *only* when this implicature is intended to be conveyed.

#### 4. Temporal anaphora in Yucatec

Section 3 has summarized the evidence suggesting that Yucatec is a tenseless language. Tenses serve to constrain the topic time of an utterance to the present, past, or future of coding time (in the case of absolute tense) or some reference point (in the case of relative tense). It is safe to assume that it is as important for Yucatec speakers as it is for English speakers to be able to distinguish narrative accounts of past events from predictions of future events or declarations of intentions about future events and, for example, descriptions of habits and statements of general rules. The question in the present section is not whether Yucatec speakers are able to infer that the topic time of any given utterance lies in the present, past, or future of coding time or some reference point; the question is how exactly they do this.

A standard claim made in discussions of tenselessness is that adverbials can be used to compensate for the lack of tense markers. While certainly not false, this is misleading to the extent that it suggests that adverbials are more frequent or play a more important role in discourses of tenseless languages than in those of tensed ones. At least as far as Yucatec is concerned, this is not the case. The events narrated in Yucatec folk tales are not anymore anchored to a calendrical time scale than those of *Hansel and Gretel* (see below for an illustration), and if a Yucatec speaker wishes to convey that the bus I have been waiting for has already left or that a house is on fire in another part of the village or that they are planning to get married, they are perfectly able and in fact likely to do so without using any temporal adverbials.

The argument to be advanced in this section is that to determine the order between the topic time of an utterance and its coding time, Yucatec speakers rely on the same “mechanism” speakers of English and other better studied languages rely on to determine topic times in context. It so happens that this mechanism is not needed to determine the relation between topic times and coding times in tensed languages such as English because these relations are

expressed by tense markers. However, the mechanism plays a key role in determining temporal relations between clauses in connected speech in tensed and tenseless languages alike. The mechanism in question is, of course, that of **temporal anaphora**. Examples of temporal anaphora have been presented throughout the previous sections. Two excerpts from larger texts may help getting a flavor for the matter. Example (29) is a passage from a demon story (discussed in detail in Bohnemeyer 2003).

- (29) Le=òotsil máak=o', káa=h-bin te'l ich  
 DET=poor person=D2 CON=PRV-go(B3SG) there in  
 'The poor man, he went (out) there to'  
 le=kòol=o'. Ti', bin, yàan te=ka'nal=o',  
 DET=clear\ATP=D2 there HS EXIST(B3SG) PREP:DET=high=D2  
 'the *milpa* (swidden, lit. 'clearance'). There he was, they say, up high  
 (i.e., in a tree),'  
 chéen káa=t-y=il-ah  
 only káa=PRV-A3=see-CMP(B3SG)  
 '(and) he saw'  
 u=tíip'-il, bin, le=ba'l=o'; túun tàal  
 A3=appear-INC HS DET=thing=D2 PROG:A3 come  
 'the thing (i.e., the demon) appear, they say; it was coming'

The first clause describes an event of a man going to work in his *milpa* or swidden. The next clause is stative and describes the man's location up in a tree. The topic time of this state description is inferred to follow that of the first clause (a point to be commented on below). The tree is understood to be either on the *milpa* or on the way there (we do not actually learn whether the man ever reached his goal, and the first clause does not entail this, contrary to its gloss). The third clause, like the first, is an event description in the perfective aspect, introduced by the connective *káa* briefly discussed in section 2, which is characteristic of narrative discourse. It introduces the man's perception of the approaching demon. The topic time of this clause is understood to be the same as that of the preceding state description: the man is up in the tree and sees the demon from there. The fourth and final clause features the progressive aspect marker. It refers to the demon's approach. Its topic time is understood to be the same as that of the preceding two clauses. The aspect markers stipulate that the perception event is included in this topic time, whereas the times of the man's being up in the tree and the demon's approach contain the topic time.



In the second excerpt, the speaker talks about the hurricane Roxana which hit his village in 1996 about a week before the recording.

- (30) Káa=h-k'uch-o'n túun way te=kàah-il  
 CON=PRV-arrive-B1PL so.then here PREP:DET=live-REL  
 'So then (when) we arrived here in the village'  
 x-Yaxley-il=e', k=il-ik=e' tuláakal  
 F-Yaxley-REL=TOP IMPF:A1PL=see-INC(B3SG)=TOP all  
 'of Yaxley, we saw (that) all'  
 máak=e', táan uy=a'l-ik-o'b=e'  
 person=TOP PROG A3=say-INC(B3SG)-3PL=TOP  
 'people (i.e., everybody), they were saying'  
 hach ts'-uy-u'b-ik-o'b ti' ràadyo=e'  
 really TERM-A3=perceive-INC(B3SG)-3PL PREP radio=TOP  
 '(that) they had really heard on the radio'  
 túun tàal le=siklòon=o'  
 PROG:A3 come DET=cyclone=D2  
 '(that) the hurricane was coming'

The first clause is marked for perfective aspect and introduces the event of the speaker's arrival in the village. As a "topic clause" (see section 2.3, 2.5), it sets the topic time for the following main clause, which in fact is the topic time for the entire passage. The main clause contains the perception verb *il* 'see' marked for imperfective aspect. This combination is an idiom frequently used in first-person narratives to describe the narrator's realization of previously unknown facts. Semantically, this idiom is interpreted perfectly. In (30), the realization is understood to take place at or after the speaker's arrival. The object of the speaker's realization is described by a sequence of three clauses. Semantically, each of these is coindexed with the "theme" argument of the previous; but syntactically, they are not embedded as complements, but rather linked anaphorically in a kind of topic chain. The first of these is marked for progressive aspect and talks about what the villagers were saying at topic time, which is still the time of the speaker's arrival. Because of the progressive, topic time is understood to fall into the time of the villagers saying this, so their talk is described as having started before the speaker's arrival. The final two clauses describe what the villagers were saying: they had heard on the radio that the hurricane was indeed going to hit their area. The clause referring to the villagers hearing the news on the radio carries the terminative AM marker, which

functions much like a (tenseless) perfect: topic time is presented as falling into the post-state of the villagers hearing the news on the radio. In other words, they are said to have heard it before the speaker's arrival. The final clause refers to the approach of the hurricane. It is marked for progressive aspect, so the approach is presented as ongoing at topic time. It will be inferred that it was in fact already ongoing at the time this was announced on the radio, but this is not strictly entailed in (30).

The similarity to the English examples discussed in the introduction is intuitively obvious: some clauses introduce a new temporal perspective – in the present framework, the topic time – perhaps advancing the previous one, whereas others are interpreted with respect to this topic time. And the difference seems to depend, among other factors, on the aspectual properties of the clauses.

The existence of temporal anaphora in a tenseless language such as Yucatec is of course not surprising (although Bohnemeyer 1998b for Yucatec and Bittner (2008) for Kalaallisut are in fact the first descriptions of temporal anaphora in tenseless languages). Nevertheless, it is worth pointing out that in Partee 1973 and in the DRT literature adopting the concept, temporal anaphora is treated as part of the interpretation of tense markers in terms of a variable they introduce whose value is determined in context. The evidence from Yucatec and Kalaallisut makes it clear that utterances are interpreted with respect to topic times whether or not they are marked for tense, and that the determination of these topic times follows similar principles in tensed and tenseless languages.

In order to sketch an informal account of the interaction between temporal anaphora and aspect-mood marking, I would like to introduce the notion of the “Natural temporal reference point”:

**(31) Natural temporal reference point (NTRP)**

A time interval  $t$  is an NTRP in a given discourse iff  $t$  is identified in that discourse as either (a) the coding time of some utterance or (b) a calendrical time interval or (c) an event time (the “run time” of an event described in the discourse).

This principle says that the times suitable as temporal reference points in discourse are the times identified on some calendar or clock-time scale and the times of events – including events described in the discourse and, in the case of deictic reference, the event of the production and/or comprehension of the utterance. What does *not* qualify a time interval as a suitable reference point or NTRP is the fact that some event is in progress at this time or that

some state holds during it – for example a causal pre- or result state of some event, a state characterizing the realization of an event in some possible worlds, or a state characterizing the distance of the event from topic time. It follows that only perfective clauses, but not non-perfective clauses, introduce NTRPs.<sup>19</sup> Non-perfective clauses do not provide such reference points, but on the contrary require them for their interpretation. This is not to say that non-perfective clauses cannot be used to introduce topic time variables. In fact, this happens whenever a non-perfective clause is used to provide background information for a narrative sequence. An example is the stative topic clause in the second line of (29). Stative clauses are strongly preferred to be interpreted imperfectively. This means that the topic time introduced by the stative clause in (29) is not the entire time the man spent up in the tree, but rather some subinterval. If a perfective clause follows, that subinterval is understood to be a suitable time frame that contains the time of the event described by the perfective clause. The stative clause introduces the topic time variable for the perfective clause, but it is the inclusion of the event time of the perfective clause in this topic time that determines its value sufficiently to make it an NTRP. Suppose now instead of the perfective clause describing the perception of the demon’s approach, the text would continue with the final progressive clause of (29), which describes the demon’s approach as being in progress at topic time, as suggested in (32):

- (32) *Ti’ bin, yàan te=ka’nal=o’*,  
 there HS EXIST(B3SG) PREP:DET=high=D2  
 ‘There he was, they say, up high (i.e., in a tree),’  
*le=ba’l=o’; túun tàal*  
 DET=thing=D2 PROG:A3 come  
 ‘the thing (i.e., the demon), it was coming’

The discourse in (32) might serve as background for a third clause using the perfective to place some event into the topic time of which we so far know that it falls into both the time of the man’s being in the tree and the time of the demon’s approach being in progress. But as a self-contained episode description, (32) not only makes a poor narrative (“nothing ever

<sup>19</sup> In non-narrative discourses, clauses formed with the imperfective AM marker and irrealis topic clauses may be used to introduce new reference points. Examples of the latter option are (10) and (19) above. It seems that in these cases, event realization and thus the introduction of NTRPs is treated inside the scope of modal or habitual/generic operators.

happens!'); it is also difficult to interpret. In (32), the imperfectively interpreted stative clause is combined with a progressive clause, which is semantically likewise imperfective. The progressive clause requires selection of a suitable topic time interval that falls into the time of the demon's approach. Even assuming the two topic times are identical, neither clause provides a suitable reference point for its resolution. Are the two states of affairs coextensive? Was the run time of one included in that of the other? Or did the two overlap partially? Principle (33) formulates the role of NTRPs in the selection of topic times:

**(33) Preferred topic time selection**

The topic times selected in a given discourse context are preferred to be identical to or include NTRPs identified in the same discourse context.

The possibility of inclusion of the NTRP in the topic time is mentioned in (33) because the topic times of perfective clauses are assumed in the present framework to contain the run times of the events described by the clauses (see Figure 1 in section 2.3). Principle (33) can be understood as a constraint on coherent discourses. Speakers craft their discourses so as to satisfy this constraint. The means at their disposal to manipulate topic time selection vary somewhat from language to language. In Yucatec, these are mainly viewpoint aspect and modal operators and adverbials; in English and other Indo-European languages, they also include tenses and temporal connective constructions.

Principles (31) and (33) together account for two key differences in the discourse behavior of perfective and non-perfective clauses. Non-perfective clauses trigger what may be called **binding implicatures** to the effect that their topic times are identical to some salient NTRP accessible in context. This can be coding time, giving rise to deictic interpretations, the time specified by some calendrical adverbial, or the event time of a perfective clause in surrounding discourse. Perfective clauses trigger no such implicatures because their topic times already include NTRPs – the run times of the events they describe. Perfective clauses can be used to introduce reference points “binding” the topic times of non-perfective clauses, and in the context of other perfective clauses, they may trigger the well-known **referential shift** interpretations. Consider (34):

- (34) *Káa=h-tàal-ech way h-ts'o'k ka'-p'éel ha'b=e',...*  
 CON=PRV-come-B2SG here PRV-end(B3SG) two-CL.IN year=TOP  
 '(When) you came here two years ago,...
- a. ...*káa=t-in=mèet-ah le=nah=o'*  
 CON=PRV-A1SG=do:APP-CMP(B3SG) DET=house=D2  
 '...I built the house'
- b. ...*táan in=mèet-ik le=nah=o'*  
 PROG A1SG=do:APP-INC(B3SG) DET=house=D2  
 '...I was building the house'
- c. ...*ts'o'k in=mèet-ik le=nah=o'*  
 TERM A1SG=do:APP-INC(B3SG) DET=house=D2  
 '...I had built the house'
- d. ...*mukah in=mèet le=nah=o'*  
 PROSP A1SG=do:APP(SUBJ)(B3SG) DET=house=D2  
 '...I was going to build the house'

The clauses in (34a–d) follow the same perfective topic clause in the first line of (34). The perfective clause in (34a) is interpreted with respect to a new, “shifted” topic time not identical to the event time of the topic clause. Pragmatic inferences to be discussed below will locate the former just after the latter, giving rise to the interpretation that the speaker started building the house upon the addressee’s arrival. In contrast, the continuations using progressive, terminative, and prospective aspect markers in (34b–d) are understood with respect to the event time of the topic clause as their topic time, giving rise to the interpretations that the construction was in progress (b), completed (c), or being planned (d) at the time of the addressee’s arrival.

Binding implicatures are stereotype implicatures of the kind discussed by Atlas & Levinson 1981, generated by Grice’s second Quantity maxim (“Do not make your contribution more informative than is required”).<sup>20</sup> Ref-

<sup>20</sup> If perfective clauses triggered binding implicatures, too, this would make narrative progression by referential shift impossible. Narratives would then require every perfective clause to be equipped with some device – an adverbial or some other expression – that explicitly signals “updating” of the topic time variable. As a matter of fact, this is precisely the function of the connective *káa* in the examples above, as discussed in section 2.5. The reason the perfective AM marker of Yucatec is accompanied by this connective in narrative discourse is that it is semantically vague between proper perfective (event time included in topic time) and perfect-like result-state interpretations (topic time included in the time of the result state).

erential shift, on the other hand, is the product of a combination of the failure to trigger binding implicatures and another stereotype implicature, this time to iconicity, i.e., to the effect that the order of clauses iconically reflects the order of events. With non-perfective clauses, this **iconicity implicature** is overridden by the binding implicature, since the latter is more specific – it yields “binding” of the topic time by a specific contextually accessible NTRP, whereas the iconicity implicature is satisfied by any time interval following the topic time of the preceding clause.

As generalized conversational implicatures, the binding and iconicity implicatures are defeasible default interpretations (Levinson 2000) triggered by the use of viewpoint-aspectual and modal operators in suitable contexts. The stative clause in (29) in fact illustrates blocking of the binding implicature: its topic time is interpreted to be shifted vis-à-vis that of the initial perfective clause because encyclopedic knowledge suggests that the man cannot have been sitting in a tree at the time he left for his *milpa*. A similar effect is illustrated in (35): the binding implicature is blocked because a balloon cannot be continued to be inflated once it has burst.

- (35) Táan u=p’uru’s-t-ik=e’, káa=h-xíik-ih  
 PROG A3=inflate-APP-INC(B3SG)=D3 CON=PRV-burst-CMP(B3SG)  
 ‘She was inflating (the balloon), (when) it burst’

Defeasibility of the iconicity implicature can be illustrated by (12)–(13) in section 2.5, repeated here for convenience:

- (36) Pedro=e’ káa=t-u=ts’iib-t-ah hun-p’éel  
 Pedro=TOP CON=PRV-A3=write-APP-CMP(B3SG) one-CL.IN  
 kàarta=e’, káa=t-u=ts’u’uts’-ah hun-p’éel chamal  
 letter=TOP CON=PRV-A3=suck-CMP(B3SG) one-CL.IN cigarette  
 ‘Pedro, (when) he wrote a letter, he smoked a cigarette’  
 (preferred interpretation sequential)
- (37) Káa=t-u=ts’iib-t-ah hun-p’éel kàarta  
 CON=PRV-A3=write-APP-CMP(B3SG) one-CL.IN letter  
 Pedro=e’, Juán=e’, káa=t-u=ts’u’uts’-ah  
 Pedro=TOP Juán=TOP CON=PRV-A3 suck-CMP(B3SG)  
 hun-p’éel chamal  
 one-CL.IN cigarette  
 ‘(When) Pedro wrote a letter, Juán smoked a cigarette’  
 (preferred interpretation for most consultants simultaneous)

The sequence of two perfective clauses in (36) triggers the familiar shift interpretation, while the one in (37) fails to do so because the two actions described have different agents. The discourse in (37) is certainly compatible with a sequential interpretation; it's just that out of context, most speakers consider the interpretation according to which the two actions occurred at the same time more salient. Bittner (2008), in her analysis of temporal anaphora in Kalaallisut within her "online update" framework, claims that temporal anaphora is in fact monotonic in "aspectually fully explicit" languages such as Kalaallisut. The examples presented above suggest that this analysis does not apply to Yucatec, even though Yucatec may well be considered "aspectually fully explicit", at least as far as the grammar of event descriptions, as opposed to state descriptions, is concerned.

The Gricean analysis of the inferences involved in aspect-based temporal anaphora resolution has the advantage over the standard DRT account that it offers an explanation for why these inferences and no others are triggered by aspectual operators and that it predicts the conditions under which these inferences are cancelled or blocked. The standard DRT approach accommodates the defeasibility of aspect-based temporal anaphora resolution as vagueness, based on the "event structure" model of Kamp 1979: the temporal reference of utterances is interpreted with respect to "instants", which in turn are constituted by sets of pairwise overlapping events. Thus, for example, while (34a) is said to introduce a new reference point at an instant that follows the reference point of the first clause, whereas (34b) is interpreted with respect to the reference point of the first clause, the two events may in both cases either overlap or follow one another. What this approach fails to explain is the default character of the inferences: sequential ordering in (34a) and simultaneity in (34b) will be inferred *unless* these interpretations are blocked or cancelled in context, as in (37) and (35). This default character follows from aspect-based temporal anaphora being rooted in generalized conversational implicatures, i.e., utterance-type meanings.

The account of temporal anaphora sketched above straightforwardly generalizes to the deictic uses of the aspect-mood markers. The binding implicatures triggered by non-perfective clauses are satisfied by calendrical adverbials or salient reference points available in context; where these are absent coding time takes over as the NTRP in accordance with (31) and (33). This gives rise to the deictic interpretations discussed in section 3: topic time is (or includes) coding time and is itself included in the run time of the event under description (with the progressive AM marker), a result state (with the terminative AM marker), a pre-state (with the prospective AM marker), some state that characterizes the realization of the described

event in possible worlds (with the modal AM markers), or some state that characterizes the distance of the described event from topic time (with the “metrical” AM markers). Smith, Perkins, & Fernald 2007 note the same affinity of non-perfective clauses for deictic interpretations in Navajo, but propose a special “Deictic Principle” to account for it. In the present treatment, this affinity follows from the fact that coding time is a natural temporal reference point in combination with the semantics of non-perfective aspect-mood markers and the generalized conversational implicatures that govern temporal anaphora.

Clauses formed with the perfective AM marker are likewise used with topic time set to coding time, under result-state interpretations. Under perfective interpretations, they are excluded from deictic uses except for the marginal “blow-by-blow” online narrative context. This follows from the fact that the topic times of semantically perfective clauses include the run times of the events described by these clauses; these cannot be included in coding time except in the “blow-by-blow” scenario where coding time and topic time are continuously updated. In other words, all of deictic future and past time reference in Yucatec in fact involves present topic times (similarly Bittner 2005 for Kalaallisut).

## 5. Concluding remarks

Why do some languages have tense marking whereas others lack it? In my opinion, for essentially the same reason some languages (including English, Ewe, German, and Yucatec) mark their noun phrases for definiteness while the speakers of others (Estonian, Latin, Mandarin, Russian, Korean, and many more) seem to get by just fine without this device. Similarly, in some languages, noun phrases are marked for noun class or gender or trigger noun class or gender agreement (e.g., German, Kinyarwanda, Latin, and Russian) whereas gender and noun class play no role in the functional category system of other languages (e.g., in English, Estonian, Ewe, and Yucatec). In many languages, event descriptions are obligatorily marked for their viewpoint aspect (e.g., English, Ewe, Russian, Yucatec); but in some, they are not (e.g., Estonian and German). In languages such as Quechua and Turkish, clauses are obligatorily marked for the source of information the speaker purports to rely on, whereas in all other languages mentioned above, this is merely optionally indicated by lexical means. The reason for this kind of crosslinguistic variation in the functional category system seems to be that the expression of functional categories such as tense, viewpoint aspect,



definiteness, gender, noun class, and evidentiality is not necessary for conveying the intended communicative content of linguistic utterances. The relevant conceptual distinctions are made whether or not they are expressed linguistically and speakers can rely on pragmatic means to communicate them where needed. Where functional categories *are* expressed, they serve to disambiguate and to facilitate reference resolution. One can thus surmise that there is a certain division of labor between pragmatics and the functional category system and a tradeoff between expressed and unexpressed categories. The expression of a rich system of aspectual and modal distinctions and simultaneous absence of tense marking in Yucatec exemplifies this tradeoff.

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