Beyond the Past, Present and Future: Towards the Semantics of 'Graded Tense' in Gĩkũyũ

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ABSTRACT: In recent years, our understanding of how tense systems vary across languages has been greatly advanced by formal semantic study of languages exhibiting fewer tense categories than the three commonly found in European languages (Bohnemeyer 2002, Lin 2006, Matthewson 2006, Jóhannsdóttir & Matthewson 2007, Tonhauser 2011). However, it has also often been reported that languages can sometimes distinguish *more* than three tenses (Comrie 1985, Dahl 1985, Bybee *et al.* 1994). Such languages appear to have 'graded tense' systems, where the tense morphology serves to track how *far* into the past or future a reported event occurs. This paper presents a formal semantic analysis of the tense-aspect system of Gĩkũyũ (Kikuyu), a Northeastern Bantu language of Kenya. Like many languages of the Bantu family, Gĩkũyũ appears to exhibit a graded tense system, wherein four grades of past tense and three grades of future tense are distinguished. However, I argue that the prefixes traditionally labeled as 'tenses' in Gĩkũyũ exhibit important differences from (and similarities to) tenses in languages like English. I will defend the hypothesis that, like tenses in English, these 'temporal remoteness prefixes' in Gĩkũyũ introduce presuppositions regarding a temporal parameter of the clause. However, unlike English tenses, these presuppositions concern the 'Event Time' of the clause directly, and not the 'Topic Time'. Consequently, the key difference between Gĩkũyũ and languages like English lies not in how many tenses are distinguished, but in whether tense-like features are able to modify other, lower verbal functional projections in the clause.

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1.   Introduction and Overview

The tense-aspect systems of natural languages provide some of the most difficult puzzles for a theory of cross-linguistic semantic variation. In addition to remarkably subtle differences in the use of particular tense-aspect combinations (Arregui *et al*. 2011), languages can also exhibit dramatic differences in the overall organization of these systems. Of those broader differences, one of the best-known concerns the number of distinctions made in the domain of tense.

There are two conceivable ways that a language's tense system might diverge from the familiar three-way distinction between 'past', 'present' and 'future'. The first, and best-studied, is for the language to exhibit fewer distinctions than these three, or perhaps none at all. Several such systems have been explored using the tools of formal linguistic theory (Baker & Travis 1997, Lee 1999, Bohnemeyer 2002, Ritter & Wiltschko 2004, Bittner 2005, Lin 2006, Matthewson 2006, Jóhannsdóttir & Matthewson 2007, Tonhauser 2011). Study of these systems has provided a wealth of insights into the scope and limits of semantic variation, as well as an exciting picture of the possible logical systems used by human language for the location of events in time.

There is, however, a second way in which tense systems might diverge from the well-known Indo-European pattern: conceivably, they could exhibit *more* distinctions than merely 'past/present/future'. Indeed, it has long been reported that there are languages whose tense systems make further, obligatory distinctions within the realm of 'past' and 'future' (Comrie 1985, Dahl 1985, Bybee *et al*. 1994, Hayashi 2011). Such languages are often said to have 'graded tense' systems, which allegedly track not only whether the event occurs before/during/after the time of speech, but also *how remote* the event is in time: whether it just happened, happened 'recently', happened more than a day ago, *etc*. The following data illustrate such a pattern in the tense-aspect system of ChiBemba, a Bantu language of Zambia.

(1)   **Temporal Remoteness Distinctions in ChiBemba (Givón 1972)**

a.	ba**àléé**bomba	*They were working (before yesterday)*
b.	ba**áléé**bomba	*They were working (yesterday)*
c.	ba**àcíláá**bomba	*They were working (earlier today)*
d.	ba**á**bomba	*They've just worked (a little while ago)*

Curiously, with the rare exception of Johnson (1977, 1980, 1981), these more articulated tense systems have not been explored with the tools of formal semantic theory. Consequently, many fundamental questions about these 'graded tense' systems remain entirely open, including the precise way in which they diverge from the more commonly studied three-way systems. Given that most formal theories of tense are based upon the three-way tense system of English, pitting those theories against systems like that in ChiBemba is of more than peripheral interest.[1]

Despite the lack of study to date, such 'graded tenses' are not especially rare. Indeed, they are quite common within some language families, Bantu being one of the best-known (Nurse 2003, 2008). In addition to ChiBemba, many other Bantu languages obligatorily mark the

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[1] This is not intended as a slight against some the exceptional descriptive work that has been carried out on specific languages. One recent work of note is Hayashi (2011), whose use of rigorous judgment tasks allows her to make a number of complex and insightful (though informal) generalizations about the meanings of the 'graded' past and future tenses in South Baffin Inuktitut.

relative remoteness of the event from the time of speech. Another such language is Gĩkũyũ (Kikuyu), a Bantu language of Kenya, whose tense-aspect system will be the focus of this paper.[2] The following is a brief sketch of some of the remoteness distinctions made in the Gĩkũyũ tense-aspect system; a more thorough introduction will be given in Section 2.

(2)   **The Graded Tenses of Gĩkũyũ (Mugane 1997)** [3]
      a. 'Current Past'   Mwangi nĩek**ũ**inaga.   *Mwangi was dancing (within the day)*
      b. 'Near Past'   Mwangi nĩa**ra**inaga.   *Mwangi was dancing (within last few days)*
      c. 'Remote Past'   Mwangi nĩ**ā**inaga.   *Mwangi was dancing (prior to 'Near Past')*
      d. 'Current Future'   Mwangi nĩek**ũ**ina.   *Mwangi will dance (within the day).*
      e. 'Remote Future'   Mwangi nĩa**ka**ina.   *Mwangi will dance (tomorrow or later).*

Although the morphological distinctions found in (1) and (2) have traditionally been labeled as ones of 'tense', such labels have typically come from descriptive grammarians who were not operating within any precise semantic theory of tense. Consequently, it is very much an open question whether the 'graded tenses' found in Bantu should truly be classified as 'tenses' in the technical sense used by semanticists. Indeed, the central claim of the present paper is that, upon careful scrutiny, the prefixes traditionally labeled as 'tenses' in Gĩkũyũ are anything but. Instead, they occupy an intriguing middle ground between tenses (in the preferred sense) and temporal frame adverbials such as *today, yesterday, tomorrow, etc.*

Since I will argue that the boldfaced prefixes in (2) are not 'tenses' as they exist in English, I will henceforth refer to them as 'temporal remoteness morphemes' (TRMs). As we will see, these TRMs possess the presuppositional semantics commonly hypothesized for tenses. However, unlike true tenses, the TRMs of Gĩkũyũ do not modify the 'Topic Time' of the sentence (Klein 1994); instead, they directly restrict the location of the 'Event Time'. These proposals will be clearer to the reader after Section 3, where I present my background assumptions regarding the syntax/semantics of tense.

Following the crucial background in Sections 2 and 3, I begin to present the key empirical arguments and theoretical proposals. Section 4 presents the core formal proposals regarding the semantics of Gĩkũyũ TRMs, and notes important semantic differences between these prefixes and temporal adverbs such as *ira* 'yesterday', *ũmũthĩ* 'today', *etc.* In general, we will find that TRMs possess a presuppositional semantics akin to that of tense and unlike that of adverbs. The key evidence here comes from certain patterns that arise when the speaker possesses incomplete knowledge regarding the time of the event described.

Having shown that TRMs are distinct from adverbs, Section 5 provides evidence that they are also distinct from tenses in languages like English. Here, I argue that semantic interactions between TRMs and perfect aspect indicate that TRMs do not serve to locate the Topic Time. Instead, the presuppositions introduced by TRMs concern the Event Time directly.

Given this, I propose that TRMs introduce partial identity functions over events, and thereby serve to restrict the location of the Event Time. Thus, they stand in interesting comparison to true tenses, which are frequently viewed as partial identity functions over times, restricting the location of the Topic Time.

Taking these facts together, an interesting picture emerges regarding the way in which 'graded tense' systems like that of Gĩkũyũ differ from systems exhibiting three or fewer tense distinctions. In a nutshell, 'graded tense' languages do not necessarily exhibit *more* tenses than those found in languages like English. Instead, such languages possess a formal category that languages like English lack. More concretely, just as tenseless languages differ from English in that they lack formal features restricting the Topic Time (Tonhauser 2011), languages like English differ from Gĩkũyũ in that they lack formal features restricting the Event Time. Although the analysis proposed here faces many challenges and puzzles, it is arguably closer to the truth than the simple claim that 'graded tense' systems possesses multiple past and future tenses.

2.　　An Introduction to the Temporal Remoteness Morphemes of Gĩkũyũ

This section provides a basic introduction to the tense-aspect system of Gĩkũyũ, especially the variety of so-called 'tenses' that Gĩkũyũ is claimed to possess. The discussion here is based upon various reference grammars of Gĩkũyũ (Barlow 1951, Gecaga 1955, Mugane 1997), the work of Johnson (1977, 1980, 1981), and reviewer comments by Professor John M. Mugane.

As mentioned in Section 1, a past-tense verb in Gĩkũyũ contains a prefix that provides further information about the distance between the event described and the time of speech. Given the morphological complexity of the language, it is best to introduce these prefixes in the context of imperfective verbs. The following illustrate the possible past-imperfectives of Gĩkũyũ.

(3)　　**Temporal Remoteness Distinctions in Past Imperfectives** [4]

a.	<u>Current Past:</u>	Mwangi	nĩe**kũ**in**aga.**
		Mwangi	nĩ-a-**kũ**-in-**aga**
		Mwangi	ASRT-3sgS-**CUR**-dance-**PST.IMP**

　　　　　　　　　　　　　　Mwangi was dancing (within the day).[5]

b.	<u>Near Past:</u>	Mwangi	nĩa**rain**aga.
		Mwangi	nĩ-a-**ra**-in-**aga.**
		Mwangi	ASRT-3sgS-**NRP**-dance-**PST.IMP**

　　　　　　　　　　　　　　Mwangi was dancing (before today, but recently)

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[4] Due to the morpho-phonological complexity of the Gĩkũyũ verb, I will provide a line of morphological decomposition in the example sentences throughout this paper. However, to save space, I will not provide a decomposition line for verbal forms that have been analyzed in earlier example sentences.

[5] As noted by John Mugane (p.c.), past imperfectives in Gĩkũyũ can also receive 'futurate readings' (Dowty 1977; Copley, to appear). Under this reading (3a) is translatable as something akin to 'Mwangi was (supposed) to dance (but did not)'.

c.	Remote Past:	Mwangi	nĩāin**aga.**
		Mwangi	nĩ-a-**a**-in-**aga.**
		Mwangi	ASRT-3sgS-**REMP**-dance-**PST.IMP**
		Mwangi was dancing (some time ago; not recently).

As shown above, there are three possible past-imperfective forms for a Gĩkũyũ verb. Following Mugane (1997), I refer to these forms as 'Current Past' (CUR), 'Near Past' (NRP), and 'Remote Past' (REMP).[6]

At a very rough level of description, the Current Past form in (3a) is used to describe events occurring within the 'day' surrounding the moment of speech. This, of course, begs the question as to what constitutes a 'day' exactly, a subject that has received substantial discussion within other studies of graded tense systems (Johnson 1977, Comrie 1985, Dahl 1985, Bybee *et al.* 1994, Nurse 2008, Hayashi 2011). Since I will have nothing original to contribute to this question, I will simply note in passing that use of the 'Current Past' is not tied to 'mind-external', objective measures of time (such as the 24 clock), but is instead a more context-dependent, subjective notion, connected at least in part to cycles of sleep and wakefulness.

At an equally rough level of description, the Near Past form in (3b) is used to describe events occurring 'recently', but prior to the current 'day'. This entails that, when describing an event that occurred on the day prior to the moment of speech (*i.e.*, 'yesterday'), the Near Past must be used. Consequently, some prior authors have described the Gĩkũyũ Near Past as a kind of 'Hesternal Past' (Gecaga 1955, Hewson & Nurse 2005, Nurse 2008). However, it is important to note that use of the Near Past is not limited to events occurring 'yesterday'. Rather, use of the Near Past seems to depend upon all the complex pragmatic factors that go into deciding whether an event occurred 'recently' or not.[7] For example, with the verb *ina* 'dance' in (4a), and without more elaborate description of the linguistic context, use of the Near Past is reported as felicitous only if the event occurred on the day prior to the moment of speech (*i.e.,* yesterday). However, with the verb *kua* 'die' in (4b), speakers readily allow Near Past to describe events occurring several days ago.

(4)   **Examples of the Near Past in Gĩkũyũ**

a.	Mwangi	nĩa**ra**inaga	(* iyo).
	Mwangi	ASRT-3sgS-**NRP**-dance-PST.IMP	day.before.yesterday
	Mwangi was dancing.		
	Speaker Judgment: Not correct if Mwangi was dancing two days ago.		

b.	Guuka	nĩa**ra**kwire	(iyo).
	Guuka	nĩ-a-**ra**-ku-ire	(iyo).
	Grandfather	ASRT-3sgS-**NRP**-die-PST.PRV	day.before.yesterday
	Grandfather died.		
	Speaker Judgment: With or without *iyo*, could be said if he died several days ago.		

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[6] Other authors have used entirely different labels for these categories (Barlow 1951, Gecaga 1955, Johnson 1977).

[7] I thank John Mugane (p.c.) for helpful discussion of this point, as well as the illustrative examples in (4).

Finally, the Remote Past in (3c) is, roughly speaking, used to describe events that did not occur 'recently'. Consequently, use of the Remote Past is tied to the same general pragmatic factors that govern the use of the Near Past. For example, with the verb *ina* 'dance' in (5), use of the Remote Past is judged to be acceptable when describing an event that occurred just two days ago. However, with other verbs and in other contexts, Remote Past would be preferably interpreted as indicating that the event occurred weeks, months, years, or even decades ago.

(5)   **Example of Remote Past in Gĩkũyũ**

Mwangi	nĩ**ā**inaga	(iyo).
Mwangi	ASRT-3sgS-**REMP**-dance-PST.IMP	day.before.yesterday

Mwangi was dancing.

<u>Speaker Judgment:</u> With or without *iyo*, could be said if he danced two days ago.

As is clear from comparing the forms in (3), the key morphological difference between these three past-tense forms lies in the identity of a particular prefix. These prefixes, which occur between the subject agreement prefix and the verbal root, are typically referred to as a 'tenses' by both Gĩkũyũ grammarians and Bantu scholars more generally (Nurse 2003, 2008). As noted earlier, however, I will break from tradition and refer to these prefixes as 'temporal remoteness morphemes', or 'TRMs'. As shown in (3a), the TRM for Current Past in imperfective verbs is *kũ*. Sentence (3b) illustrates the TRM for Near Past, *ra*, and (3c) illustrates the TRM for Remote Past, *a*.

At this point, I should note an orthographic problem relating to Remote Past forms. In this paper, all Gĩkũyũ data are represented using official Gĩkũyũ orthography (Barlow 1951). Unfortunately, this orthography does not distinguish vowel-length in certain parts of the verb (Barlow 1951). Consequently, although the verb in (3c) contains a long /a/ just before the root, this vowel is orthographically rendered as if it were short, the official spelling being "nĩainaga". This convention is very unfortunate, since as we will see, the length of this particular vowel is of key importance in many examples. Therefore, following Barlow (1951), I will break from the official orthography here, and I will use a macron to represent whether the vowels immediately preceding the verb root are long.

Thus far, we have noted that the verbs in (3) contain a TRM, a verbal root, and a subject agreement prefix. In addition, these verbal forms all begin with the so-called 'assertive' prefix *nĩ*. Despite the simple gloss as 'ASRT', the nature of this prefix is a very difficult analytic puzzle (Schwarz 2003, 2007), one that is entirely orthogonal to the analysis of the tense-aspect system. Finally, these verbal forms also all end in the suffix *aga*. Following Johnson (1977, 1980, 1981), I analyze this suffix as encoding both the features 'past' and 'imperfective'; consequently, it is glossed as 'PST.IMP'. The reason for this is two-fold. First, as we will see, this suffix does not appear in present imperfective forms (13). Secondly, although present and future forms can occur suffixed with -*aga*, such forms have only a habitual reading, as shown below.

(6) **The Habitual Suffix –*Aga***

      Mwangi   ateng'er**aga**   rũcinĩ.
      Mwangi   a-teng'er-**aga**   rũcinĩ.
      Mwangi   3sgS-run-GEN/HAB morning
      Mwangi runs in the morning.
      <u>Judgment:</u> True/appropriate if Mwangi is a runner who generally runs in the morning.

Thus, following Johnson (1977, 1980, 1981), I will assume that the -*aga* suffix in (6) above is a mere homophone of the one appearing in (3).[8]

      Having thoroughly examined the past-imperfective forms in (3), let us now turn to past-perfectives. Again, there are three possible forms that a past-perfective verb in Gĩkũyũ can take.

(7) **Temporal Remoteness Distinctions in Past Perfectives**

    a.   <u>Current Past:</u>   Mwangi   nĩain**ire**.

                                 Mwangi   nĩ-a-∅-in-**ire**

                                   Mwangi   ASRT-3sgS-**CUR**-dance-**PST.PRV**
                                   Mwangi danced (within the day).

    b.   <u>Near Past:</u>   Mwangi   nĩa**ra**in**ire**.

                                   Mwangi   nĩ-a-**ra**-in-**ire**.

                                   Mwangi   ASRT-3sgS-**NRP**-dance-**PST.PRV**
                                   Mwangi danced (before today, but recently).

    c.   <u>Remote Past:</u>   Mwangi   nĩ**ā**in**ire**.

                                   Mwangi   nĩ-a-**a**-in-**ire**.

                                   Mwangi   ASRT-3sgS-**REMP**-dance-**PST.PRV**
                                   Mwangi danced (some time ago; not recently).

As with past-imperfectives, past-perfective verbs must be Current Past, Near Past, or Remote Past. The meanings of these sub-categories are the same as in the imperfectives in (3), though their morphological expression is slightly different.[9] As shown in (7a), Current Past in perfective verbs is expressed by a null prefix, rather than the prefix *kũ* found in (3a). Consequently, the key

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[8] Properly speaking, Johnson only considers the habitual/generic suffix in *future* tense forms to be distinct, and she does identify the –*aga* suffix in (6) with that in (3). However, the motivation for making the cut in this way is quite unclear. After all, -*aga* in present-tense forms like (6) is also restricted to a habitual/generic interpretation, which is Johnson's main motivation from separating the suffix in (3) from the homophonous one occurring in future forms.

[9] As we will later see in Section 4.2, the meaning of Current Past in perfective verbs differs slightly from its meaning in imperfective verbs. Due to the existence of 'Immediate Past Perfective' forms (9), Current Past perfectives like (7a) are usually understood to describe actions occurring more than a few minutes ago. Since there is no comparable 'Immediate Past Imperfective', Current Past imperfectives like (3a) can be understood to describe events that were occurring just a few seconds ago.

phonological difference between (7a) and (7c) lies in subtle features of pre-radical vowel length and accent, which following Barlow (1951) I represent using the macron over the vowel in (7c).

In addition to the TRM prefixes, the verbs in (7) all contain the suffix *–ire*. I will follow Johnson (1977, 1980, 1981) in analyzing this suffix as 'perfective' (PRV).[10] However, given that verbs bearing the *–ire* suffix are always past tense, I will also assume that this suffix encodes the feature 'PST'.[11]

In addition to perfective and imperfective aspect, Gĩkũyũ verbs can also bear 'perfect aspect' (PERF). As illustrated below, verbs bearing perfect morphology can also bear TRMs.

(8)   **Temporal Remoteness Distinctions in Perfects**

    a.   <u>Simple Perfect:</u>   Mwangi   nĩain**ĩte**.

                         Mwangi   nĩ-a-in-**ĩte**.

                         Mwangi   ASRT-3sgS-dance-**PERF**
                         Mwangi has/had danced.

    b.   <u>Current Perfect:</u>   Mwangi   nĩe**kũ**in**ĩte**.

                         Mwangi   nĩ-a-**kũ**-in-**ĩte**.

                         Mwangi   ASRT-3sgS-**CUR**-dance-**PERF**
                         Mwangi has/had danced (within the day).

    c.   <u>Near Perfect:</u>   Mwangi   nĩa**ra**in**ĩte**.

                         Mwangi   nĩ-a-**ra**-in-**ĩte**.

                         Mwangi   ASRT-3sgS-**NRP**-dance-**PERF**
                         Mwangi has/had danced (before today, but recently).

    d.   <u>Remote Perfect:</u>   Mwangi   nĩ**ā**in**ĩte**.

                         Mwangi   nĩ-a-**a**-in-**ĩte**.

                         Mwangi   ASRT-3sgS-**REMP**-dance-**PERF**
                         Mwangi has/had danced (some time ago; not recently).

As we see here, verbs in the perfect aspect needn't bear a TRM (8a), though they are also able to bear the same TRM prefixes as imperfective verbs (8b-d).[12] I will refer to perfect forms lacking a TRM as 'simple perfects' (8a), while perfects containing a TRM will be dubbed 'complex perfects' (8b-d).

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[10] Johnson uses the term 'completive' (as does Mugane 1997), but this is merely intended by Johnson as a less-confusing alternative to the more traditional label 'perfective'.

[11] As shown in (10)-(11) below, future perfective verbs in Gĩkũyũ do not appear with the suffix *–ire*. Moreover, there does not appear to be a category of 'present perfectives', a cross-linguistically common state of affairs that has a well-known semantic basis (Bennett & Partee 1978).

[12] Note, however, that Past Imperfective and Past Perfective verbs *must always* bear TRM prefixes, as must future tense verbs (10), (12). As discussed in Section 6, explaining the varied distribution of TRM categories across finite forms remains a difficult question for future research.

Past grammarians have tended to describe simple perfects like (8a) as present perfects and complex perfects like (8b-d) as past perfects (or 'pluperfects') (Barlow 1951, Johnson 1977). However, as we will see in Section 5, the situation seems to be a bit more complex. Relatedly, the exact contribution of the TRMs in (8b-d) is an empirically delicate matter. Nevertheless, the following comment by Barlow (1951) is close to what I will later propose.

"… (Current Perfect) expresses an action that had been completed at some time previous on the day of speaking…(Near Perfect) expresses an action that had been completed yesterday…(Remote Perfect) expresses an action which had been completed at some time previous to yesterday…" (Barlow 1951: 135-136).[13]

Section 5 will provide a more detailed discussion of the meanings of the forms in (8) above. For now, it is worth noting that we again find the three-way distinction between Current, Near, and Remote forms.

Before we turn to TRMs in future-tense verbs, we must note the existence of the 'Immediate Past Perfective' form, illustrated below.

(9)   **Immediate Past Perfective**

Mwangi   nĩ**ā**in**a**.

Mwangi   nĩ-a-**a**-in-**a**.

Mwangi   ASRT-3sgS-**IMM.PST.PRV**-dance-**FV**

Mwangi (just) danced.

As the translation indicates, 'Immediate Past Perfective' (IPP) verbs describe actions that have 'just' occurred, usually mere minutes ago.

The Immediate Past Perfective has a somewhat exceptional status within the overall tense-aspect system (Johnson 1977, 1980, 1981). First, there is no comparable 'Immediate Past' category for imperfective verbs. Secondly, and most notably, although IPP verbs are perfective in aspect, they do not bear the suffix –*ire* that is otherwise indicative of that aspect.[14] Instead, they seem to bear the default suffix –*a*, commonly referred to by Bantuists as the 'final vowel' (FV). The main morphological marker of IPP verbs is the prefix *a-*, homophonous to and found in the same location as the TRM for Remote Past. I will follow Johnson (1977, 1980, 1981) in assuming the prefix *a-* in IPP verbs is a distinct prefix from the TRM found in Remote forms.[15] I will also follow Johnson in assuming that the *a-* prefix in IPP forms encodes tense, aspect and

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[13] Of course, this informal description is itself is somewhat ambiguous. However, given the facts we will consider in Section 5, I take Barlow here to mean that the *completion* itself occurs either on 'the day of speaking', 'yesterday' or 'previous to yesterday', respectively.

[14] Barlow (1951) and Johnson (1977, 1980, 1981) refer to IPP verbs as being 'perfect'. It is unclear, however, on what grounds that analysis is made. Of course, I myself have no very firm grounds to label them as 'perfective' either. However, since the consultants I have worked with so often translate IPP verbs as simple pasts in English (and *vice versa*), I will take up the view that they are perfective. Note, though, that even if we choose to view IPP verbs as 'perfect', they would still exceptionally lack the –*īte* suffix that is otherwise characteristic of that aspect.

[15] Note, however, that Hewson & Nurse (2005) argue for an analysis that treats these as the same prefix.

'temporal remoteness'. Thus, as the gloss in (9) suggests, I will assume that this prefix bears all three of the features PST (past), PRV (perfective), and IMM (Immediate Past).

Thus far, the TRMs we have seen serve to locate an event in the past. However, TRMs are also obligatory in future tense verbs.

(10)   **Temporal Remoteness Distinctions in Future Tense Forms**

   a. <u>Current Future:</u> Mwangi **nĩekũ**ina.

            Mwangi nĩ-a-**kũ**-∅-in-**a**

            Mwangi ASRT-3sgS-**CUR-FUT**-dance-**FV**

            Mwangi will dance (within the day; or soon).

   b. <u>Remote Future</u> Mwangi **nĩa**ka**ina.**

            Mwangi nĩ-a-**ka**-∅-in-**a**

            Mwangi ASRT-3sgS-**REMF-FUT**-dance-**FV**

            Mwangi will dance (some time after today).

The verbs in (10) illustrate two of the three future tense 'grades' that Gĩkũyũ possesses; the third will be discussed briefly below. Following Mugane (1997), the future form in (10a) will be dubbed 'Current Future', while that in (10b) will be labeled 'Remote Future'.

Current Future forms like (10a) appear to have two distinct kinds of uses. First, such verbs are widely reported to describe future events occurring on the day of speech (Barlow 1951; Gecaga 1955; Johnson 1977, 1980, 1981; Mugane 1997). However, in addition to this meaning, Barlow (1951) and John Mugane (p.c.) report that Current Future forms like (10a) can be used to describe events that are in some sense psychologically 'close', even if they aren't to occur precisely on the day of speaking. This latter use is illustrated in (11) below.

(11)   **Current Future for 'Impending' (or 'Scheduled') Events**

   a. Tũ**gũ**thĩ   mweri   ũyũ.

     tũ-**kũ**-∅-thi-a   mweri   ũyũ

     1plS-**CUR-FUT**-go-FV month   this

     We shall be going this month. (Barlow 1951: 130)

   b. Mwangi **nĩe**g**ũ**aka   nyũmba.

     Mwangi nĩ-a-**kũ**-∅-ak-a   nyũmba.

     Mwangi ASRT-3sgS-**CUR-FUT**-build-FV house

     Mwangi will build a house. (John Mugane, p.c.)

     <u>Speaker Comment:</u> The sentence is not predicting that Mwangi will build the house *today*, but it does suggest a context where we're assigning duties.

Under this second use, Current Future forms seem to bear an intriguing similarity to futurate progressives in English; given their reported meaning, the sentences in (11) could be felicitously translated into English as 'We are going this month' and 'Mwangi is building a house',

respectively.[16] With this in mind, it is worth noting that Barlow (1951) – which was based upon research conducted between 1914 and 1934 – reports that 'Current Future' forms like (10a), (11) can be used as present progressives (Barlow 1951: 41-43, 129-130), and that the (more modern) present progressive forms illustrated below in (13) "have become more prevalent in recent years" (Barlow 1951: 130).

These facts suggest the following picture concerning the use of the Current Future in (11). First, until perhaps the middle of the 20th Century, the form we label 'Current Future' had a productive use as present imperfective/progressive and a 'Hodiernal Future' (a 'future of today'). Eventually, however, the modern forms in (13) below became the regular exponent of present imperfective, and the 'Current Future' forms became restricted primarily to their use as a Hodiernal Future. However, the earlier status of forms like (10a) as present imperfectives is retained in the secondary usage illustrated in (11) above, where they have a meaning akin to futurate progressives in English.

The upshot of all of this is that, for better or worse, I will assume in my discussion that the usage in (11) is a separate, isolable meaning for the surface forms in question. That is, I will assume – perhaps wrongly – that Current Future forms like (10a) are *ambiguous*, and that under one interpretation, they are future tense forms where the described event is restricted to the day of speaking. Finally, it is this Hodiernal Future use that I will develop a semantics for in this paper; sentences like those in (11) will be bracketed as a problem for future research.

While the usage of Current Future forms (10a) has the complexities outlined above, the meaning of Remote Future forms (10b) is relatively straightforward: they are used to describe events that will occur later than the day of speaking. It should also be noted that all the future forms in (10) and (11) appear to be 'perfective' in aspect. To express the meaning of 'Future Imperfective' in Gĩkũyũ, a complex auxiliary construction must be used (14), (Mugane 1997: 137).

Turning to the morphological structure of the verbs in (10), the key contrast again lies in a prefix occurring between AgrS and the verb root. In the Current Future, this prefix is *kũ* (CUR); in the Remote Future, the prefix is *ka* (REMF). I will follow Johnson (1977, 1980, 1981) in assuming that the 'Current' prefix in (10a) is the same as that appearing in Current Past imperfectives (3a) and Current perfects (8b). Consequently, the future meaning of (10a) cannot

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[16] John Mugane (p.c.) also mentions two other examples fitting this pattern. First, sentence (i) is reported as the translation of 'Jesus is coming back', and does not imply that the return will be on the day of speaking.

(i)   Jesũ   nĩe**gũ**coka.

    Jesũ   nĩ-a-**kũ**-∅-cok-a
    Jesus   ASSRT-3sgS-**CUR-FUT**-return-FV
    Jesus is coming back.

Similarly, sentence (ii) is reported to be felicitous in a context where a church congregation has saved enough money to send Mwangi to school, even if his schooling will not take place on the day of the utterance.

(ii)   Mwangi   nĩe**gũ**thoma.

    Mwangi   nĩ-a-**kũ**-∅-thom-a
    Mwangi   ASRT-3sgS-**CUR-FUT**-go.to.school-FV
    Mwangi will go to school. / Mwangi is going to school.

I would like to note in passing that both these sentences could, in context, be translated into English using futurate present progressives.

be contributed by the TRM prefix alone. I assume, then, that the verbs in (10) also contain a null prefix that encodes the feature 'future' (FUT). [17]

In addition to the two forms in (10), Gĩkũyũ also possesses a third future form. Following Mugane (1997), I refer to this as the 'Near Future' (NRF).

(12) **Near Future**

Mwangi   nĩarĩina.

Mwangi   nĩ-a-rĩ-∅-in-a

Mwangi   ASRT-3sgS-**NRF-FUT**-dance-**FV**

Mwangi will dance (some time soon).

According to existing descriptions (Barlow 1951; Gecaga 1955; Johnson 1977, 1980; Mugane 1997, p.c.), Near Future forms are used primarily to describe future events that are 'near', 'soon', or 'within the next few days or so'. I must note, however, that the speakers I worked with did not make significant use of Near Future forms. Such forms were never spontaneously offered by these speakers, though they were accepted. Consequently, the present study will not offer much discussion of these forms, and no formal analysis will be proposed.

The final tense-aspect form to consider is the present imperfective, illustrated below.

(13) **Present Imperfectives**

Mwangi   nĩaraina.

Mwangi   nĩ-a-**ra**-in-a.

Mwangi   ASRT-3sgS-**PRS.IMP-**dance-**FV**

Mwangi is dancing.

As noted by Johnson (1977, 1980, 1981), present imperfectives have many of the morphological peculiarities of Immediate Past Perfectives (9). Although forms like (13) are imperfective, they do not have the suffix *–aga* found in past imperfectives. Instead, the verb root again ends in the default 'final vowel'. Thus, the main morphological marker of present imperfectives is the prefix *ra-*, homophonous to the Near Past TRM found in the same location. I will follow Johnson (1977, 1980, 1981) in assuming that the prefix *ra-* found in present-imperfective verbs like (13) is a distinct prefix from the TRM found in Near Past forms.[18] I will also follow Johnson in assuming that the *ra-* prefix in present-imperfective forms encodes both tense and aspect. Thus, as the gloss in (13) suggests, I will assume that this prefix bears both the features PRS (present), and IMP (imperfective). Furthermore, I assume that these verb forms do *not* contain TRMs. That

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[17] Conceivably, one could also propose that the suffix *–a* in these verbs is a future tense suffix that is simply homophonous with the default final vowel. This would seem to be of comparable complexity to my hypothesis of a phonologically null future morpheme.

[18] Again, however, Hewson & Nurse (2005) sketch an analysis whereby Near Past and Present Imperfectives contain the same prefix *ra*.

is, they encode only the categories tense (present) and aspect (imperfective), and so fall outside of the 'temporal remoteness' system illustrated in (3)-(12).

The morphological categories illustrated above constitute all those that will be discussed and analyzed in the present paper. However, it should be noted that these categories in no way exhaust the tense-aspect-mood system of Gĩkũyũ. For example, I will offer no discussion here of the so-called 'consecutive' or 'conditional' morphology of the language. Furthermore, I will not provide a discussion or analysis of the complex tense-aspect forms, created through the addition of the auxiliary *korwo* 'found' (Mugane 1997: 120-140).

(14)   **Complex Tense-Aspect Form: The Future Imperfective**

Mwangi	e**gũ**korwo	a**gi**thondeka	ruga.
Mwangi	a-**kũ**-korwo	a-**ki**-thondek-a	ruga
Mwangi	3sgS-**CUR**-find.PASS	3sgS-**PARALLEL**-make-FV	cake

Mwangi will be making a cake.

However, it is the case that the prefixes illustrated in (3)-(12) *do* exhaust all those traditionally labeled as 'tenses' in the literature on Gĩkũyũ (Barlow 1951, Gecaga 1955, Johnson 1977, Mugane 1997).

3.   Background Assumptions Regarding the Syntax and Semantics of Tense and Aspect

This paper will presuppose familiarity with various key works in the syntax and semantics of tense-aspect systems (Reichenbach 1947; Partee 1973, 1984; Hornstein 1990; Kamp & Reyle 1993; Heim 1994; Klein 1994; Stowell 1996; Abusch 1997; Kratzer 1998; Demirdache & Uribe-Etxebarria 2000, 2004; Schlenker 2004, Kusumoto 2005). Some of the formal assumptions made here are taken directly from the aforementioned works, while others are augmented slightly. For reasons of space, my presentation of these ideas will be rather terse, but they should be comprehensible to those familiar with the works cited above.

I adopt the notion, central to so much work on the syntax and semantics of tense-aspect systems, that tense and aspect together locate events in time by coordinating three distinct temporal parameters: Utterance Time (UT), Event Time (ET), and Topic Time (TT). UT is, of course, the time of the speaker's utterance, while ET is the time of the event/state in question. The notion of 'Topic Time' is difficult to formulate precisely, but roughly speaking it is the time that the assertion in question is 'about' or 'confined to' (Reichenbach 1947, Klein 1994). The distinct status of TT is most clearly illustrated by past perfects, such as in the boldfaced clause below.

(15)   We arrived at Mwangi's house this morning, but **he had already left yesterday.**

For the boldfaced clause in (15), the UT is the moment of speech, while the ET is the time of Mwangi's departure. There is, however, another key time at play in (15), which is the time of our arrival at Mwangi's house. This is the time identified as the TT.

I will also adopt the notion, originating with Klein (1994), that tense and aspect play two distinct roles in relating UT, TT and ET. While aspect specifies the relation between TT and ET,

tense provides information about the relation of TT to UT. For example, the perfect aspect in (15) indicates that the TT follows the ET; the time of our arrival follows Mwangi's departure. However, the past tense in (15) indicates that the UT follows the TT; the time of our arrival occurred in the past, prior to the moment of utterance. I refer the reader to the works above for more thorough discussion of these key ideas.

While these proposals have been formally implemented in a variety of ways, I will follow an approach that has become widely used in the semantic literature. It has long been noted that there are interesting semantic parallels between tense and pronouns (Partee 1973, 1984; Heim 1994; Abusch 1997; Kratzer 1998; Schlenker 2004). A rather straightforward way of capturing these is to suppose that tense *is* a pronoun of sorts, a pronoun referring to times.[19] Under this view, the tense features themselves (past, present, *etc.*) serve to constrain the reference of tense in the way that gender features constrain the reference of pronouns. To be more precise, I assume that past tense has the structure illustrated below.

(16)   **The Structure of a Past-Tense (Heim 1994, Kratzer 1998)**

$$T'$$
$$T_i \qquad [PST]$$
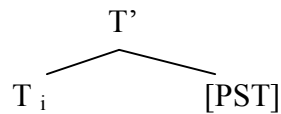
Like any pronoun, the tense T bears an index *i*. In addition, it is sister to a tense feature, which can be 'past' [PST], 'present' [PRS], *etc.* Following much work on the semantics of pronominal features, I assume that tense features like [PST] are interpreted as partial identity functions, and so serve to introduce presuppositions regarding the referent of the tense itself (Heim & Kratzer 1998; Sauerland 2002, 2003; Sauerland *et al.* 2005). The relevant lexical entries are as follows.

(17)   **The Semantic Components of Past Tense**

a. $[[T_i]]^{g, t}$ $=$ $g(i)$
b. $[[PST]]^{g, t}$ $=$ $[\lambda t' : t' < t \, . \, t']$
c. $[[PRS]]^{g, t}$ $=$ $[\lambda t' : t \subseteq t' \, . \, t']$

As indicated above, I assume that interpretation is relative to a variable assignment *g* and an 'evaluation time' *t*. Thus, the lexical entry in (17b) states that at a particular evaluation time *t*, the feature [PST] denotes the identity function restricted to those times *t'* which are prior to *t*. Consequently, the interpretation function $[[\, . \,]]^{g, t}$ will only assign a meaning to T' in (16) if the assignment function *g* maps the index *i* of the T-node to a time preceding *t* (Heim & Kratzer 1998; Sauerland 2002, 2003). Although I will not make much use of it in this paper, I assume that the present tense feature [PRS] has the entry in (17c), and so restricts the TT to times that contain the evaluation time *t*. Finally, it should be noted that, since I will not be discussing embedded tenses in this paper, the evaluation time *t* will always be equal to the Utterance Time.

The hypotheses in (16) and (17) formalize the notion that tense denotes a particular temporal interval. But what of our earlier statement that tense features provide information about the relation between TT and UT? Interestingly, we can reconcile these views through the

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[19] Throughout this paper, 'times' are understood to be intervals of temporal points (Bennett & Partee 1978).

hypothesis that syntactic tense nodes denote the TT itself (Kratzer 1998, *inter multia alia*). This view, which is common throughout much of the semantic literature on tense, will be key to some of my later arguments. Consequently, I will highlight it below.

(18)   **Key Hypothesis: Tense Denotes Topic Time (Kratzer 1998)**

The tense node of a clause denotes the Topic Time. The tense features on the tense node constrain the reference of the tense node, and thus the identity of the Topic Time.

These proposals concerning tense are most viable when combined with a particular approach to the semantics of verbal aspect, to which we now turn. To begin, let us clarify our assumptions concerning the morphosyntax of aspect and tense. The structure below summarizes the key assumptions I will make concerning the LF structure of a tensed English sentence.

(19)   **The Morphosyntax of Tense and Aspect**
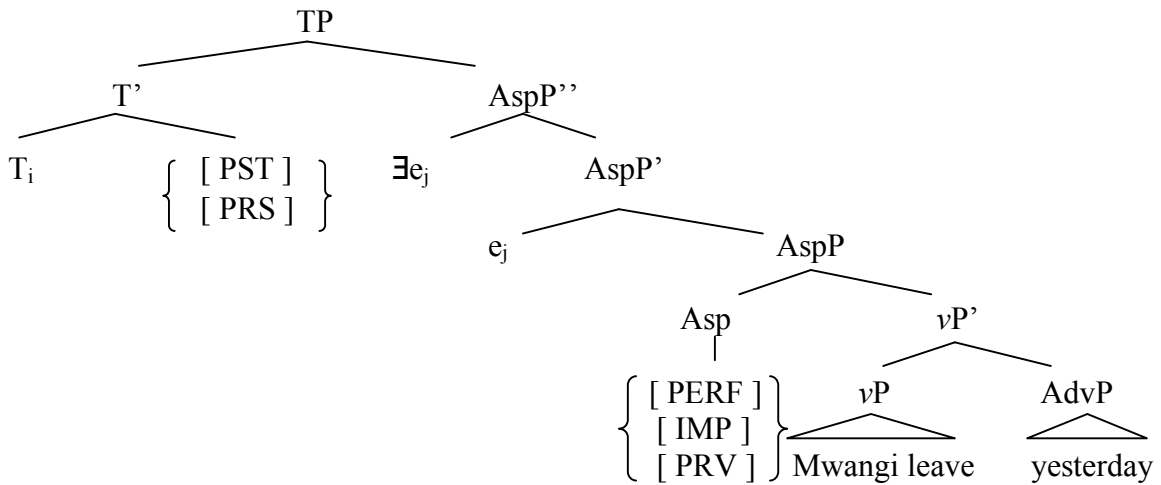
First, I assume that every tensed clause contains a Tense Phrase (TP), and that the Tense head of this TP is a temporal pronoun with the structure in (16). The complement of this TP is an Aspect Phrase (AspP), headed by the aspectual features 'perfect' (PERF), 'imperfective' (IMP) and 'perfective' (PRV). Next, the complement of this AspP is the (little) *v*P, which contains the verbal root and its arguments. Two other features of the AspP deserve special attention. First, I assume that the specifier of the AspP is an event pronoun 'e_j', which bears a distinct pronominal index. Secondly, I assume that this event pronoun 'e_j' is obligatorily bound by an existential quantifier '$\exists e_j$'. In other words, as will become clear in a moment, I assume that the Davidsonian event argument of the *v*P is syntactically projected within the AspP, and that existential closure over this argument takes place within the syntax. Concerning temporal adverbs like *yesterday*, I assume that they may adjoin either to *v*P or to AspP''.[20] Finally, for purposes of simplicity, I assume that at LF, all verbal arguments reconstruct to *v*P-internal positions.

With these syntactic assumptions in place, let us now present our remaining semantic assumptions, beginning with the semantics of *v*P. I will adopt the now common assumption that

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[20] As we will see shortly, the position of the adverb will affect whether it is understood to modify the ET or the TT.

*v*Ps denote predicates of events (or 'eventualities'), and so are of type $<\varepsilon,t>$. In this paper, I will abstract away from the details of their internal semantic composition, and will simply assume equations such as the following.

(20) **Neo-Davidsonian Event Semantics for vPs**

$[[\ [_{vP} \ Mwangi \ leave \ ] \ ]]^{g,\,t} \quad = \quad [\ \lambda e : leave(e) \ \& \ Agent(e) = Mwangi \ ]$

Regarding temporal 'locating adverbs' such as *yesterday*, I will adopt the relatively common assumption that they denote type $<i,t>$ predicates of times (Kamp & Ryle 1993, Demirdache & Uribe-Etxebarria 2004), as illustrated below.

(21) **The Semantics of Temporal Adverbs [21]**

    a. $[[\ yesterday \ ]]^{g,\,t}$ $=$ $[\ \lambda t' : t' \subseteq$ the day preceding $t \ ]$
    b. $[[\ today \ ]]^{g,\,t}$ $=$ $[\ \lambda t' : t' \subseteq$ the day surrounding $t \ ]$
    c. $[[\ tomorrow \ ]]^{g,\,t}$ $=$ $[\ \lambda t' : t' \subseteq$ the day following $t \ ]$

Given the assumptions in (20) and (21), a problem immediately arises concerning the semantics of the *v*P' projection in (19). Although I assume the syntax allows temporal adverbs to be sister to *v*P, their semantic types - $<\varepsilon,t>$ and $<i,t>$ - will not compose via the typical rules of Function Application or Predicate Modification (Heim & Kratzer 1998). I therefore introduce the special rule in (22), illustrated in (23), where the notation '$T(e)$' stands for 'the time of the event e'.

(22) **The Rule of Temporal Event Modification**

If Z is a binary branching structure with daughters X and Y, and X is of type $<\varepsilon,t>$ and Y is of type $<i,t>$, then relative to any variable assignment *g* and evaluation time *t*:
    $[[\ Z \ ]]^{g,\,t} \quad = \quad [\ \lambda e : [[X]]^{g,t} (e) \ \& \ [[Y]]^{g,t} (T(e)) \ ]$

(23)   a. $[[\ [_{vP'} \ [_{vP} \ Mwangi \ leave \ ] \ [_{AdvP} \ yesterday \ ] \ ] \ ]]^{g,\,t}$ $=$ (by (22))

    b. $[\ \lambda e : [[Mwangi \ leave]]^{g,t}(e) \ \& \ [[yesterday]]^{g,t}(T(e)) \ ]$ $=$ (by (20), (21))

    c. $[\ \lambda e : leave(e) \ \& \ Agent(e) = Mwangi \ \& \ T(e) \subseteq$ the day preceding t $]$

Thus, the *v*P' projection in (19) is interpreted as a predicate that holds of an event *e* iff *e* is an event of leaving whose agent is Mwangi and whose Event Time T(*e*) is a subpart of the day preceding the time of utterance.

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[21] The entries in (21) state that the interpretation of the adverbs *yesterday*, *today*, *tomorrow* depends upon the evaluation time *t*. However, it is more common to view the meaning of these elements as dependent upon a contextual parameter *c*, distinct from the evaluation time *t* (Schlenker 2004). However, because the data motivating this practice are not discussed in this paper (e.g., the inability for adverbials to 'shift' in complement clauses), I omit the parameter *c* for purposes of simplicity.

As mentioned above, I assume following Klein (1994) that the meaning of verbal aspect characterizes the relation between the ET and the TT. Given our formal assumptions in (18)-(21), this general perspective can be captured through lexical entries like the following.

(24)   **The Formal Semantics of Aspect**

   a. $[[\text{IMP}]]^{g,\,t}$ = $[\ \lambda P_{<\varepsilon t>} : [\ \lambda e : [\ \lambda t' : T(e) \supseteq t' \ \& \ P(e)\ ]\ ]\ ]$
   b. $[[\text{PRV}]]^{g,\,t}$ = $[\ \lambda P_{<\varepsilon t>} : [\ \lambda e : [\ \lambda t' : T(e) \subset t' \ \& \ P(e)\ ]\ ]\ ]$
   c. $[[\text{PERF}]]^{g,\,t}$ = $[\ \lambda P_{<\varepsilon t>} : [\ \lambda e : [\ \lambda t' : T(e) < t' \ \& \ P(e)\ ]\ ]\ ]$

Under the semantics in (24), an Aspect head takes as its first argument a predicate of events *P*. Given the syntax in (19), this predicate *P* will be contributed by the *v*P complement of AspP. After taking $[[v\text{P}]]^{g,t}$ as argument, the aspect head returns a relation holding between an event *e* and a time *t'*. As we will see in a moment, this time *t'* will be contributed by the T-node of the TP, and thus will be the Topic Time of the sentence. Furthermore, as can be seen by a cursory examination of (24), the relation returned by the aspect head will hold between an event *e* and the TT *t'* if and only if a particular topological relation holds between the Event Time of *e* (*T*(e)) and *t'*. Thus, as can be seen from (24a), imperfective aspect (IMP) will require that the Event Time *T*(e) *contains* the Topic Time *t'*, a common view of the semantics of IMP (Bennett & Partee 1978). Similarly, perfective aspect (PRV) will require that the Event Time *T*(e) *is contained in* the Topic Time *t'* (24b), and perfect aspect (PERF) will require that the Event Time *T*(e) *precedes* the Topic Time *t'* (24c), both of which are widespread views in the semantics of aspect (Bennett & Partee 1978).

Before we can explicitly compute meanings for LFs like (19), there are two final elements we must provide a semantics for: the event pronoun 'e_j' and the existential quantifier '$\exists e_j$'. As the reader will see momentarily, the entries below will suffice.

(25)   **The Semantics of the Event Argument and its Existential Binder**

   a. $[[\ e_j\ ]]^{g,\,t}$ = $g(j)$
   b. $[[\ \exists e_j\ \text{XP}\ ]]^{g,\,t}$ = $[\ \lambda t' : \exists e \, . \, [[\text{XP}]]^{g(j \to e),\,t}(t')\ ]$

The reader is invited to confirm that, with these ingredients in place, we can compute the meaning of an Asp'' headed by 'PERF' in the following way.

(26)   **The Compositional Semantics of the Complement of TP**

$[[\ [_{\text{AspP''}} \ \exists e_1 \ [_{\text{AspP'}} \ e_1 \ [_{\text{AspP}} \ \text{PERF} \ [_{v\text{P'}} \ \text{Mwangi leave yesterday}\ ]\ \dots\ ]\ ]]^{g,t}$ =
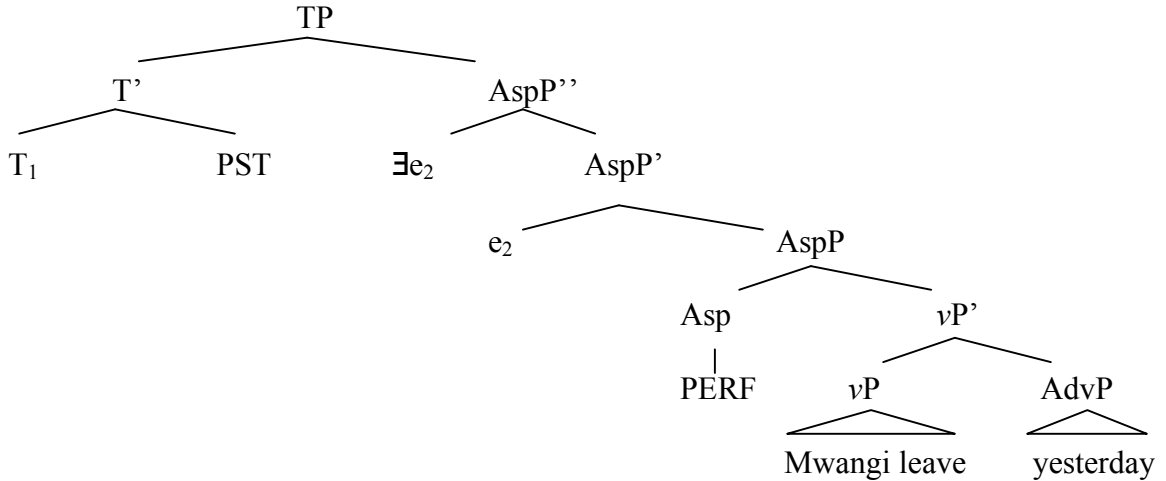
$[\ \lambda t' : \exists e \, . \, T(e) < t' \ \& \ \text{leave}(e) \ \& \ \text{Agent}(e) = \text{Dave} \ \& \ T(e) \subseteq \text{the day preceding } t\ ]$

Putting together all the individual pieces in (16)-(26) we arrive at the following picture concerning the compositional semantics of the boldfaced English sentence in (15).

(27) **The Compositional Semantics of Tense and Aspect**

    a.   Sentence:
          We arrived at his house this morning, but **Mwangi had already left yesterday.**
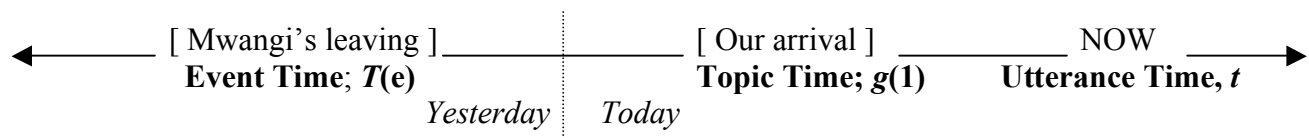
    b.   Assumed LF:

```
                       TP
            _____/  _____
         T'                         AspP''
      __/  \__                   __/   \__
    T₁        PST            ∃e₂         AspP'
                                      __/   \__
                                   e₂         AspP
                                           __/  \__
                                        Asp        vP'
                                         |       __/  \__
                                       PERF     vP      AdvP
                                               /\        /\
                                        Mwangi leave   yesterday
```

    c.   Predicted Truth Conditions
          $[[\text{TP}]]^{g,t}$ is defined only if $g(1) < t$ (consequence of $[[\text{PST}]]^{g,t}$)
                         if defined, then it is T *iff*:

$$\exists e \,.\, T(e) < g(1) \ \& \ \text{leave}(e) \ \& \ \text{Agent}(e) = \text{Mwangi} \ \& \ T(e) \subseteq \text{the day preceding } t$$

As the reader can confirm, our semantics for PST in (17b) predicts that LF (27b) will only have an interpretation relative to g and t if g maps the index of 'T₁' to some time prior to t (the Utterance Time). Thus, given the assumption in (18), it follows that (27) will only have a defined meaning if the TT precedes the UT. Moreover, given the denotation of the AspP'' in (26), it follows that the entire TP will be true *iff* the Topic Time ($g(1)$) follows the Event Time ($T(e)$) of an event of Mwangi leaving. In this way, we see that the semantic contribution of Tense restricts the relation between the TT and the UT, while the semantics of aspect restricts the relation between the TT and the ET, just as famously proposed by Klein (1994). Finally, the modification of vP by the adverb *yesterday* contributes the information that the ET is contained within the day preceding the UT. Therefore, we can give the predicted truth-conditions of (27a) the topological representation in (28).

(28) **Graphic Representation of Truth-Conditions in (27c)**

```
◄──────── __ [ Mwangi's leaving ] _____┊_____ [ Our arrival ] _____ NOW ____ ►
              Event Time; T(e)              ┊          Topic Time; g(1)     Utterance Time, t
                             Yesterday  ┊  Today
```

Finally, before we turn back to the semantics of Gĩkũyũ TRMs, there are two further matters to briefly discuss. First, we've seen that in sentences like (27a), a temporal adverb can be understood as modifying the Event Time of the clause. However, it's been noted that such adverbs can also be understood as modifying the Topic Time (Demirdache & Uribe-Etxebarria 2000, 2004). For example, a sentence like (29) below allows a reading whereby the Topic Time is 'yesterday' while the Event Time (the time of the repair) is two days ago.

(29)   **Temporal Adverbs Modifying Topic Time**
        Yesterday, Dave had already fixed Mary's car one day earlier.

Happily, such readings are entirely consistent with our semantic assumptions in (16)-(25). Given that adverbs like *yesterday* are of type <it>, our semantics predicts that they can be modifiers of AspP'', combining with such phrases via the general rule of Predicate Modification. As the reader is invited to confirm, under such a parse, the temporal adverb will predicate the Topic Time of the clause, rather than the Event Time. Since such readings are not of central importance to our analysis of Gĩkũyũ TRMs, I will put them aside in the remainder of this paper.

Secondly, the reader will no doubt have noticed that the list of tenses in (17) does not include an entry for 'future'. Indeed, I will adopt the commonly held view that future is not really a 'tense'; rather, it is a modal or aspectual category (Enç 1996, Copley 2002, Condoravdi 2002; *cf.* Kissine 2008). In particular, I will assume that the feature 'FUT' (at least in Gĩkũyũ) is a kind of aspectual head, with the semantics below.

(30)   **The Semantics of Future (Copley 2005)**

        $[[\text{FUT}]]^{g, t}$ = $[\lambda P_{<\varepsilon t>} : [\lambda e : [\lambda t' : t' < T(e) \ \& \ P(e)]]]$

Thus, future indicates that the ET *follows* the TT, and so is a kind of inverse of the perfect aspect.[22] To illustrate, a simple 'future tense' sentence like (31a) is assumed to have the LF in (31b), and thus the truth-conditions in (31c).

(31)   **Illustration of the Syntax and Semantics of 'FUT'**

        a.   <u>Sentence:</u>   *Dave will dance tomorrow.*

        b.   <u>LF Structure</u>
              [$_{TP}$ [$_{T'}$ T$_1$ PRS] [$_{AspP''}$ Ǝe$_2$ [$_{AspP'}$ e$_2$ FUT [$_{vP'}$ [$_{vP}$ Dave dance] [$_{AdvP}$ tomorrow]]]]]

        c.   <u>Predicted Truth-Conditions</u>
              $[[\text{TP}]]^{g, t}$ is defined only if $t \subseteq g(1)$. If defined, then it is T *iff:*

              Ǝe . $g(1) < T(e) \ \& \ \text{dance}(e) \ \& \ \text{Agent}(e) = \text{Dave} \ \& \ T(e) \subseteq$ the day following t
                   There is an event e of Dave dancing such that T(e) follows the TT and falls on the day following the UT.

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[22] I thank Angelika Kratzer for this interesting observation.

Thus, our system predicts that (31a) is only true if the TT contains the UT, and the ET *follows* the TT. Consequently, we correctly predict that (31a) is true only if the ET – the time of Dave's dancing – follows the UT.

3.1 A Brief Note on Partial Identity Functions Modifying Bound Variables

In the sections to follow, I will argue that Gĩkũyũ TRMs should be analyzed as partial identity functions modifying the event pronoun 'e_j' within the specifier of AspP. In this way, the Gĩkũyũ TRMs are treated like tense features appearing within the AspP. However, given that the event pronoun 'e_j' is bound by the existential operator '$\exists e_j$', the content of the TRM features will not 'project' in the way predicted and observed for formal features modifying unbound pronouns, such as the tense features in T. Since this point will be important for understanding the formal analysis presented in the following section, I will spend just a few moments expanding upon it.

The fact of central importance here is the general equivalence proven in (32) below. To begin, consider the partial identity function '$[\lambda y : Q(y) . y]$', whose domain is restricted to those entities z such that '$Q(z)$'. Suppose now that this function takes as argument the variable 'x', and that the result is argument to the predicate 'P'. Finally, suppose that the variable 'x' is itself existentially bound, yielding the formula '$\exists x . P ([\lambda y : Q(y) . y](x))$'. As the proof below demonstrates, this formula is logically equivalent to the formula '$\exists x . Px \& Qx$', where the predicate 'Q' introduced by the partial function is simply conjoined with the predicate 'P'.

(32) **A Critically Important Logical Equivalence**

'$\exists x . P ([\lambda y : Q(y) . y](x))$' is T *iff* '$\exists x . Px \& Qx$' is T.

Proof:
a.   '$\exists x . P ([\lambda y : Q(y) . y](x))$' is T *iff*
b.   There is an α such that '$P ([\lambda y : Q(y) . y](\alpha))$' is T *iff*
c.   '$[\lambda y : Q(y) . y](\alpha) = \alpha$' is T and '$P(\alpha)$' is T *iff*
d.   '$Q(\alpha)$' is T and '$P(\alpha)$' is T *iff*
e.   '$\exists x . P(x) \& Q(x)$' is T

This equivalence will be used in the following section to simplify various derived truth-conditional statements. As the reader will see, however, this equivalence will have a curious effect. Although the TRMs will be analyzed as partial identity functions – which introduce definedness conditions / presuppositions into the meaning of *sub-constituents* of the larger sentence – their global contribution to the sentence's truth-conditions will be equivalent to that of a type $<\varepsilon,t>$ modifier of the *v*P. Thus, one cannot hope to use the standard 'projection tests' for presupposition to confirm the proposed 'presuppositional' semantics for Gĩkũyũ TRMs. Consequently, the evidence that Gĩkũyũ TRMs have such a 'presuppositional' semantics will necessarily be rather indirect, and will rest upon the way in which the principle 'Maximize Presupposition' (Heim 1991) might explain certain puzzles concerning the use of TRMs.

These points will become clearest to the reader after Section 4. However, it is nevertheless worth highlighting them here, particularly for those readers who may (incorrectly)

expect that our 'presuppositional' semantics for Gĩkũyũ TRMs should predict certain distinctive interactions within larger discourse units.

4.   The Presuppositional Semantics of TRMs in Gĩkũyũ

In this section, we will begin examining in more detail the semantics of Gĩkũyũ's Temporal Remoteness Morphemes. The main analytic claim of this section is that these prefixes have a 'presuppositional semantics' akin to that proposed for tense in (17). As briefly foreshadowed in Sections 1 and 3, the basic idea is that TRMs denote partial identity functions over events, and so serve to introduce presuppositions concerning the location of the Event Time of the sentence.

The empirical argument for this semantics will rest on the use of TRMs in contexts where the speaker is (partially) ignorant of the exact time of the event described. We will see that, in these contexts, some TRMs appear to have a *weaker* meaning than was suggested by our informal discussion in Section 2. This fact, in turn, raises the question of why these TRMs indeed seem to have a *strengthened* interpretation in contexts where the speaker knows the time of the event. I will argue that this strengthened interpretation is best analyzed as a so-called 'anti-presupposition', *i.e.*, as a consequence of the principle 'Maximize Presupposition'. As we will see, such an analysis will require that TRMs have a presuppositional semantics akin to that given for tense.

4.1   Temporal Remoteness Morphemes in Contexts of Speaker Ignorance

Section 2 provided a rather broad, informal description of Gĩkũyu's TRM prefixes. According to that discussion, the meanings of the prefixes glossed 'CUR', 'NRP', 'REMP', and 'REMF' could be roughly summarized as follows.

(33)   **Earlier Characterization of the Semantics of Gĩkũyũ TRMs (3)-(10)**

a.	<u>Remote Past:</u>	Event did not occur recently.
b.	<u>Near Past:</u>	Event occurred recently, *but not today*.
c.	<u>Current Past:</u>	Event occurred today.
d.	<u>Current Future:</u>	Event will occur today.
e.	<u>Remote Future:</u>	Event will occur some time *after* today.

That is, following standard reference works on the language, it was reported that (i) the Remote Past restricts the described event to 'non-recent' times, (ii) the Near Past restricts the event to 'recent' times that *precede* the day of speaking, (iii) the Current Past restricts the event to the day of speaking, as does (iv) the Current Future, and (v) the Remote Future restricts the event to times *following* the day of speaking.

Importantly, however, this informal semantics in (33) raises a rather obvious question: what TRM should a speaker use when they aren't at all sure whether (a) the event occurred recently or not, (b) the event occurred today or yesterday, or (c) the event will occur today, tomorrow, or weeks from now? Curiously, existing references on Gĩkũyũ are entirely silent on this question, an omission that provided the initial impetus for this study. As we will see, the

answer to this question will ultimately suggest a rather different picture of the meaning of the TRMs in (33).

To begin, consider the context in (34) and the judgments reported for sentences (34a-c).

(34) **Context Where the Event May or May Not Have Happened 'Recently'**

Situation: You are visiting your friend Mwangi, who you haven't seen in weeks. There is a brand new TV in his living room. You have no idea when he bought the TV. It could have been several days ago; it could have been yesterday; it could have been today. You want to ask when he bought it:

a.　　Wa**gũ**rire　　　　　　　　　　rĩ　　TV iyo?

u-**a**-gũr-ire　　　　　　　　　　rĩ　　TV iyo
2sgS-**REMP**-buy-PST.PRV　　　when　TV that
When did you buy that TV?
Judgment:　　Correct in this context. Offered by speakers as translation of
　　　　　　　　"When did you buy that TV?"

b.　　U**ra**gũrire　　　　　　　　　　rĩ　　TV iyo?

u-**ra**-gũr-ire　　　　　　　　　　rĩ　　TV iyo?
2sgS-**NRP**-buy-PST.PRV　　　when　TV that
When did you buy that TV?
Judgment:　　*Not* correct in this context. Would only be used if you believed (or
　　　　　　　　strongly suspected) that the purchasing happened 'recently'.

c.　　Ugũrire　　　　　　　　　　　　rĩ　　TV iyo?

u-∅-gũr-ire　　　　　　　　　　　rĩ　　TV iyo?
2sgS-**CUR**-buy-PST.PRV　　　　when　TV that
When did you buy that TV?
Judgment:　　*Not* correct in this context. Would only be used if you believed (or
　　　　　　　　strongly suspected) that the purchasing happened 'today'.

As shown above, if a speaker is completely ignorant as to the time of a past event – if the speaker has no guess as to whether it occurred 'today', 'recently', or 'not recently' – then the *Remote Past* must be used (34a).[23] Note that this is a direct challenge to the informal generalization in (33a) that the Remote Past necessarily limits the event to 'non-recent' times. After all, if such a limitation were part of the meaning of REMP, then use of that prefix in (34a) would be as anomalous in the context above as the use of NRP in (34b) or CUR in (34c). While it is easiest to elicit these judgments through the use of 'when questions' as in (34), parallel facts can be observed for declaratives, as shown below.

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[23] Note, however, that if the speaker has some reason to believe / suspect that the event occurred 'recently', then the Near Past must be used (34b). Similarly, if there is some evidence that the event occurred 'today', then the Current Past must be used (34c). We will see later that this nuance is predicted by our formal account (Footnote 44). I thank John Mugane for bringing these facts to my attention.

(35)   **Context Where the Event May or May Not Have Happened 'Recently'**

Situation: Today, you visited a group of your friends who live together. You've not seen them for quite some time. When you go to their house, you notice that they've got a new TV. You have absolutely no idea when they bought it: it could have been today, yesterday or weeks ago. Later that day, you get home. Your roommate asks how everyone is. You want to tell her about the new TV.

a.   Nĩm**ā**gũrire   TV   njeru!

ñĩ-ma-**a**-gũr-ire   TV   njeru!

ASRT-3plS-**REMP**-buy-PST.PRV   TV   new
They bought a new TV!
<u>Judgment</u>:   Correct in this context. Offered by speakers as translation of
                     "They bought a new TV!"

b.   Nĩma**ra**gũrire   TV   njeru!

ñĩ-ma-**ra**-gũr-ire   TV   njeru!

ASRT-3plS-**NRP**-buy-PST.PRV   TV   new
They bought a new TV!
<u>Judgment</u>:   *Not* correct in this context. Would only be used if you believed (or
                     strongly suspected) that the purchasing happened 'recently'.

c.   Nĩm**a**gũrire   TV   njeru!

ñĩ-m**a**-∅-gũr-ire   TV   njeru!

ASRT-3plS-**CUR**-buy-PST.PRV   TV   new
They bought a new TV!
<u>Judgment</u>:   *Not* correct in this context. Would only be used if you believed (or
                     strongly suspected) that the purchasing happened 'today'.

Again, we find that if the speaker is entirely ignorant of when a past event occurred, then the so-called 'Remote Past' TRM must be used.[24] Given the importance of these facts to our analysis, they are summarized and highlighted below.

(36)   **Generalization Regarding the 'Remote Past'**
        REMP is used when a speaker does not know whether an event occurred on the day of the utterance, 'recently', or some time prior to that.

        Now let us consider contexts in which the speaker does know that the event in question occurred 'recently', but is entirely unsure as to whether it occurred on the day of speech or not. Such a context is presented in (37) below.

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[24] As mentioned in Footnote 23, however, if the speaker has reason to believe that the event occurred 'today' or 'recently', then they must use the Current Past and the Near Past, respectively.

(37) **Context Where the Event May or May Not Have Happened 'Today'**

Situation: You are visiting your friend Mwangi, who you haven't seen since yesterday. There is a brand new TV in his living room. You don't know exactly when he bought it. It could have been yesterday, after your visit. It could have been earlier today. However, it definitely could not have been before yesterday. You want to ask when he bought it:

a. Ur**a**gũrire   rĩ   TV iyo?
    2sgS-**NRP**-buy-PST.PRV   when TV that
    When did you buy that TV?
    Judgment: Correct in this context. Offered by speakers as translation of
                "When did you buy that TV?"

b. Ugũrire   rĩ   TV iyo?
    2sgS-**CUR**-buy-PST.PRV   when TV that
    When did you buy that TV?
    Judgment: *Not* correct in this context. Would only be used if you believed (or
                strongly suspected) that the purchasing happened 'today'.

c. Wagũrire   rĩ   TV iyo?
    2sgS-**REMP**-buy-PST.PRV   when TV that
    When did you buy that TV?
    Judgment: *Not* correct in this context, because you were in touch with him
                yesterday, and so you know that the TV wasn't bought before then.

As shown above, if the speaker knows that the event happened 'recently' – but cannot say for certain whether it happened 'today' or earlier – then the *Near Past* form must be used (37a). This fact seems to contradict the informal generalization in (33b) that the Near Past necessarily limits the event to times prior to the day of speech. Again, if this were actually part of the meaning of NRP, then (37a) should be as anomalous in this context as (37b). It is also worth noting here that use of REMP in this context is rejected as well (37c), a fact that will later be of much importance.

While the sentences in (37) are all interrogative, the data in (38) show that parallel judgments can be obtained for declarative sentences.[25]

(38) **Context Where the Event May or May Not Have Happened 'Today'**

Situation: Today, you visited a group of friends who live together. You saw them yesterday, but are stopping by again today. When you go to their house, you notice that they've got a new TV. You don't know exactly when they bought it: it could have been

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[25] Data parallel to those in (37) and (38) have been independently discovered by Hayashi (2011) for the 'Hodiernal Past' and 'Pre-Hodiernal Past' of South Baffin Inuktitut. This raises the possibility that the analysis developed here for Gĩkũyũ TRMs may indeed have broad cross-linguistic applicability.

after your visit yesterday, but it could also have been today. Later that day, you get home. Your roommate asks how everyone is. You want to tell her about the new TV.

a. Nīma**ra**gũrire   TV   njeru!
    ASRT-3plS-**NRP**-buy-PST.PRV   TV   new
    The bought a new TV!
    Judgment: Correct in this context. Offered by speakers as translation of
                 "They bought a new TV!"

b. Nīmagũrire   TV   njeru!
    ASRT-3plS-**CUR**-buy-PST.PRV   TV   new
    They bought a new TV!
    Judgment: *Not* correct in this context. Would only be used if the speaker
                 believed (or *strongly suspected*) the purchase happened today.

c. Nīm**ā**gũrire   TV   njeru!
    ASRT-3plS-**REMP**-buy-PST.PRV   TV   new
    They bought a new TV!
    Judgment: *Not* correct in this context, because you were in touch with them
                 yesterday, and so know that the TV wasn't bought before then.

Again, we find that if the speaker does not know whether a 'recent' event occurred 'today' or earlier, the Near Past must be used. This fact is summarized and highlighted below.

(39) **Generalization Regarding the 'Near Past'**
      NRP is used when a speaker does not know whether an event occurred on the day of the utterance or at an earlier 'recent' time, *but does know that it occurred 'recently'*.

Finally, let us consider contexts where the speaker is not at all sure whether some future event will occur 'today' or at some later time.

(40) **Context Where Event May or May Not Happen 'Today'**

      Situation: You know I am planning a trip to New York soon, but you have no idea when I will be leaving. It could be today for all you know, but it could also be several days from now. You want to ask when I am leaving:

a. Ugathie   rĩ   New York?
    u-ka-Ø-thi-a   rĩ   New York
    2sgS-**REMF-FUT-**go-FV   when   New York
    When will you go to New York?
    Judgment: Correct in this context. Offered by speakers as translation of
                 "When will you go to New York?"

b.   Ugũthie   rĩ   New York?

     u-kũ-∅-thi-a   rĩ   New York

     2sgS-**CUR-FUT-**go-FV   when New York

     When will you go to New York?

     <u>Judgment:</u>   *Not* correct in this context. Would only be used if the speaker
                        believed (or *strongly suspected*) the trip was today.

As we see above, if the speaker is completely ignorant as to the time of a future event – if the
event could for all they know happen either today or tomorrow or later – then the *Remote Future*
must be used (40a).[26] This is again a challenge to the informal generalization in (33e) that the
Remote Future limits the event to times following the day of speech. Given its importance to our
argumentation, this fact is highlighted below.

(41)   **Generalization Regarding the 'Remote Future'**
       REMF is used (in interrogatives) when a speaker does not know whether an event will
       occur on the day of the utterance or some time after that.

       It should be noted, however, that while the judgments reported in (40) have been robustly
confirmed on several occasions, I have had some difficultly obtaining parallel judgments for
declarative sentences. For the contexts I have attempted to date, speakers generally prefer
locutions other than REMF to make assertions about future events whose time is uncertain. For
example, in a context directly parallel to (40), speakers prefer to use the present progressive
(42a) to speak of Mwangi's state. While (42b) has been offered and accepted on a few occasions,
its use does not seem to be as favored as that of (40a). Regrettably, while I believe (41) is
accurate for interrogatives, I will need to leave declaratives as a puzzle for future study.

(42)   **Context Where Event May or May Not Happen 'Today'**

       Situation: You know that Mwangi will leave for New York soon. However, you're not
       sure exactly whether he is leaving today or tomorrow. I see that Mwangi is hurring about,
       going shopping, cleaning his house, etc. I ask "What is up with Mwangi?" You answer:

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[26] John Mugane, a native speaker of Gikũyũ, reports disagreement with this judgment, and reports that the following
'Near Future' sentence must be used in context (40), rather than sentences (40a) or (40b).

      (i)   Urĩthie   rĩ   New York?

            u-rĩ-∅-thi-a   rĩ   New York

            2sgS-**NRF-FUT**-dance-FV when New York

            When will you go to New York?

However, the speakers I have worked with have confirmed that, for them, (40a) is felicitous in the associated
context. When asked about the Near Future sentence in (i), the speakers agreed that this sentence would also be
acceptable, but had no clear preference between the two. As mentioned in Section 2, these speakers have never made
spontaneous use of the 'Near Future' in our interviews, and for this reason, I must leave Near Future as a problem
for future study.

a. | Mwangi | nĩa**ra**thie | New York. |

| | Mwangi | nĩ-a-**ra**-thi-a | New York |
| | Mwangi | ASRT-3sgS-**PRS.IMP**-go-**FV** | New York |

Mwangi is going to New York.

Judgment: Correct in this context. Offered by speakers as the most natural answer to the question prompt.

b. | Mwangi | nĩa**ga**thie | New York. |

| | Mwangi | nĩ-a-**ka**-∅-thi-a | New York |
| | Mwangi | ASRT-3sgS-**REMF-FUT**-go-**FV** | New York |

Mwangi will leave for New York.

Judgment: *Not* correct in this context. Moreover, would only be used if the speaker believed (or *strongly suspected*) the trip was after today.

4.2 The 'Specificity Principle' for Gĩkũyũ Temporal Remoteness Morphemes

As noted above, the generalizations in (36), (39) and (41) – repeated below – directly challenge the informal semantic characterization of the Gĩkũyu's TRMs from Section 2 and (33).

(43) **Generalization Regarding the 'Remote Past'**
REMP is used when a speaker does not know whether an event occurred on the day of the utterance, 'recently', or some time prior to that.

(44) **Generalization Regarding the 'Near Past'**
NRP is used when a speaker does not know whether an event occurred on the day of the utterance or at an earlier 'recent' time, *but does know that it occurred 'recently'*.

(45) **Generalization Regarding the 'Remote Future'**
REMF is used (in interrogatives) when a speaker does not know whether an event will occur on the day of the utterance or some time after that.

Indeed, (43)-(45) suggest the following general picture regarding the meanings of these prefixes.

(46) **Informal Semantic Hypotheses, Based on Generalizations (43)-(45)**

a. Current Past   Applies only to events that occurred 'today'

b. Near Past: Applies to *all* 'recent' events, including those that occurred 'today'

c. Remote Past: Applies to *all* past events, including 'recent' ones and ones that occurred 'today'.

d. Current Future: Applies only to events that will occur 'today'

e. Remote Future: Applies to *all* future events, including ones occurring 'today'

Unlike the hypotheses in (33), those in (46) are consistent with the generalizations in (43)-(45). Importantly, under this view, the Current Past is strictly *stronger* in its meaning than the Near Past, which is in turn stronger than the Remote Past. Similarly, the Current Future is strictly *stronger* than the Remote Future. In addition to its consistency with the facts in (43)-(45), the general picture in (46) is supported by contrasts like the following.

(47)   **Supporting Evidence that 'Near Past' is Weaker than 'Current Past'**

a.	Mwangi	nĩ**ara**teng'erire	ira	na	ũmũthĩ
	Mwangi	nĩ-a-**ra**-teng'er-ire	ira	na	ũmũthi
	Mwangi	ASRT-3sgS-**NRP**-run-**PST.PRV**	yesterday	and	today

Mwangi ran today and yesterday.
Judgment: Well-formed, sensible sentence. Offered as translation of the
English sentence "Mwangi ran today and yesterday."

b.	* Mwangi	nĩateng'erire	ira	na	ũmũthi
	Mwangi	nĩ-a-Ø-teng'er-ire	ira	na	ũmũthi
	Mwangi	ASRT-3sgS-**CUR**-run-**PST.PRV**	yesterday	and	today

Judgment: Ill-formed sentence. No sensible interpretation.

While a precise account of this contrast lies beyond the scope of this paper,[27] we can nevertheless observe that the conjoined modifier *ira na ũmũthĩ* 'yesterday and today' can combine consistently with a Near Past verb (47a), but cannot modify a Current Past verb (47b). This coheres well with the view in (46a,b) that Near Past covers *all* recent events – including those occurring 'today' – while Current Past only covers events occurring 'today'.

Unfortunately, while these 'logical strength' relations in (46) are well motivated empirically, they also face a rather acute empirical challenge. Note that if the Near Past is indeed stronger than the Remote Past, then a sentence headed by a Near Past verb should *entail* a parallel sentence with a Remote Past verb. However, as shown in (37c) and (38c), speakers adamantly deny that Remote Past sentences are in any sense 'true' or 'correct' in contexts where corresponding Near Past sentences are. That is, the informal hypotheses in (46) are immediately faced with the following problem. If 'Remote Past' verbs truly apply to *all* past events, then why is use of the Remote Past so strongly infelicitous in contexts like (37) and (38), where the event in question is known to have happened 'recently'? Note too that there is a crucial contrast here with English. In the context in (38), an English speaker could felicitously utter either of the sentences in (48).

(48)   **English Sentences Felicitous in Context (38)**

a.   They bought a TV.   (unrestricted past reference)
b.   They bought a TV recently.   (past reference restricted to 'recent' times)

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[27] Any such account will need to provide an analysis of the conjoined adverb 'yesterday and today', an issue that itself requires substantial discussion.

Thus, we find that the felicity of the English sentence (48b) does not 'block' the use of the weaker sentence in (48a). Why, then, should the felicity of Near Past (38a) – which is allegedly parallel to English (48b) – seem to 'block' the use of Remote Past (38c) – which is allegedly parallel to (48a)?

As shown below, this same general question also arises for the Near Past, Current Past, and Current Future TRMs. That is, if we assume the basic picture in (46), it would seem that the use of TRMs in Gĩkũyu is governed by the following general principle.

(49)   **The Specificity Principle**
Speakers must use the most specific TRM consistent with their knowledge. That is, if the use of a particular TRM α is 'licit' in some context, then the speaker *cannot* use any TRM weaker than α.

Before we consider possible explanations for (49), let us first observe its effect across a variety of TRMs and contexts. To begin, consider the context in (50) and the judgments for (50a-c).

(50)   **The Specificity Principle and Current Past**

Situation: A local store is running a special promotion. If you bought a TV any time during the year, you can bring in the receipt and get a free DVD player. You bought a TV **today**, and have the receipt with you. You walk to the counter, and want to ask for your free DVD player.

a. Nĩngũrire   TV,   na   noo nyende   DVD player.

nĩ-n-∅-gũr-ire   TV   na   noo nyende   DVD player
ASRT-1sgS-**CUR**-buy-PST.PRV   TV   and   I.would.like DVD player
I bought a TV, and I would like a DVD player
Judgment: Correct in this context. Offered as a translation of the English "I bought a TV, and I would like a DVD player."

b. Nĩnda**ra**gũrire   TV,   na   noo nyende   DVD player.

nĩ-n-**ra**-gũr-ire   TV   na   noo nyende   DVD player
ASRT-1sgS-**NRP**-buy-PST.PRV   TV   and   I.would.like DVD player
I bought a TV, and I would like a DVD player
Judgment: Not felicitous in this context. Would only be used if you *didn't* buy the TV today.

c. Nĩnd**a**gũrire   TV,   na   noo nyende   DVD player.

nĩ-n-**a**-gũr-ire   TV   na   noo nyende   DVD player
ASRT-1sgS-**REMP**-buy-PST.PRV   TV   and   I.would.like DVD player
I bought a TV, and I would like a DVD player
Judgment: Not felicitous in this context. Would only be used if you *didn't* buy the TV recently.

As shown above, in contexts where the speaker knows that the event occurred on the day of speech, the Current Past *must* be used (50a), and neither the Near Past nor the Remote Past are acceptable. A similar pattern is shown for the Near Past in (51).

(51)   **The Specificity Principle and Near Past**

Situation: A local store is running a special promotion. If you bought a TV any time during the year, you can bring in the receipt and get a free DVD player. You bought a TV **yesterday**, and have the receipt with you. You walk to the counter, and want to ask for your free DVD player.

a.   Nĩnda**rag**ũrire   TV,   na   noo nyende   DVD player.
        ASRT-1sgS-**NRP**-buy-PST.PRV   TV   and   I.would.like   DVD player
        I bought a TV, and I would like a DVD player
        <u>Judgment:</u>   Correct in this context. Offered as a translation of the English "I
                            bought a TV, and I would like a DVD player."

b.   Nĩnda**a**gũrire   TV,   na   noo nyende   DVD player.
        ASRT-1sgS-**REMP**-buy-PST.PRV   TV   and   I.would.like   DVD player
        I bought a TV, and I would like a DVD player
        <u>Judgment:</u>   Not felicitous in this context. Would only be used if you *didn't* buy
                            the TV recently.

As shown in (51), in a context where the speaker knows that the event occurred 'recently', the Near Past must be used (51a), and the Remote Past is not acceptable (51b).
        The Specificity Principle in (49) also leads to an interesting restriction on the use of the Current Past. As shown below, in contexts where the speaker knows that the event occurred just a few moments ago, the Immediate Past Perfective (52a) precludes use of the Current Past Perfective (52b).

(52)   **The Specificity Principle and the Immediate Past Perfective**

Situation: Your roommate Mwangi has just left for the store in the last couple minutes. Your friend Kamau walks in and asks where Mwangi is. You answer:

a.   Mwangi   nĩ**ā**thie   nduka.
        Mwangi   nĩ-a-**a**-thi-a   nduka.
        Mwangi   ASRT-3sgS-**IMM.PST.PRV**-go-**FV**   store
        Mwangi went to the store.
        <u>Judgment:</u>   Correct in this context. Offered as a translation of the English
                            "Mwangi went to the store."

b.

Mwangi	nĩathiire		nduka.
Mwangi	nĩ-a-∅-thi-ire		nduka.
Mwangi	ASRT-3sgS-**CUR**-go-PST.PRV		store

Mwangi went to the store.
<u>Judgment:</u> *Not* felicitous in this context. Would only be used if Mwangi left a while ago.

However, as noted in Section 2, the 'Immediate Past' TRM category is only available for perfective verbs; there is no corresponding category for imperfective verbs in Gĩkũyu. Consequently, as shown below, Current Past can be used with *imperfective* verbs to describe events that were occurring just a few moments ago.

(53) **Current Past Imperfectives Can Describe Events in the 'Immediate Past'**

Situation: You are at a party. Mwangi is in one room dancing. You leave the room for a moment, and see your friend Kamau in the hallway. He says, "Oh man, I would love to see Mwangi dance!" You want to tell him that Mwangi was just dancing a second ago.

a.

Mwangi	no	hĩndĩ	nĩekũinaga.
Mwangi	no	hĩndĩ	nĩ-a-**kũ**-in-aga
Mwangi	just	time	ASRT-3sgS-**CUR**-dance-PST.IMP

Mwangi was just dancing.
<u>Judgment:</u> Correct in this context. Offered as a translation of the English "Mwangi was just dancing."

Thus, the infelicity of (52b) in context (52) appears to be tied to the existence of the stronger, more specific 'Immediate Past' form in (52a).

Finally, let us observe the activity of the Specificity Principle (49) in future tense sentences. As shown below, if the speaker knows that the event in question is to occur on the day of speech, the Current Future must be used (54a), and the Remote Future is not acceptable (54b).

(54) **The Specificity Principle and the Current Future**

Situation: You know I am planning a trip to New York, and that I am to leave *today*, but you don't know the exact hour of my departure. You want to ask when I am leaving:

a.

Ugũthie		rĩ	New York?
u-kũ-∅-thi-a		rĩ	New York
2sgS-**CUR-FUT**-go-FV		when	New York

When will you go to New York?
<u>Judgment:</u> Correct in this context. Offered by speakers as translation of "When will you go to New York?"

b.   Ugathie   rĩ   New York?

u-ka-∅-thi-a   rĩ   New York
2sgS-**REMF-FUT-**go-FV   when   New York
When will you go to New York?
<u>Judgment:</u>   *Not* felicitous in this context. Would only be used if the addressee
                     were leaving 'tomorrow'.

Thus far, we've seen that the Specificity Principle in (49) accounts for various patterns in the use of Gĩkũyu TRMs in discourse. But what, in turn, explains the existence of this principle? As the reader has no doubt noticed, our principle in (49) seems like it might be a simple consequence of the more general pragmatic principle below.

(55)   **Gricean Maxim of Quantity**
"Make your contribution as informative as is required (for the purposes of the exchange). Do not make your contribution more informative than is required." (Grice 1975)

After all, as is well known, the Maxim of Quantity generally puts pressure on a speaker to make the strongest assertion consistent with their knowledge. Consequently, in a discourse like that in (56), only the strongest assertion in (56a) is acceptable. Although (56b) would technically be 'true' in this context, any assertion of it would be in violation of (55), and so would be felt to be 'incorrect' or 'infelicitous'.

(56)   **The Maxim of Quantity At Work**

Situation: Mary has four children. Bill has just asked Mary how many children she has.

a.   I have four children.   <u>Judgment:</u> Felicitious in this context.
b.   I have three children. <u>Judgment:</u> Not felicitous in this context. Would
                                only be used if Mary had no more than three children.

At first blush, then, it seems that the judgments in (50)-(54) involve nothing more than the typical kind of scalar implicature found so often with lexical items ordered in terms of their strength. Indeed, exactly this kind of analysis is (momentarily) put forth by Hayashi (2011: 51-54) for parallel data concerning the 'graded tenses' of South Baffin Inuktitut.

Unfortunately, despite its *prima facie* appeal, a Gricean explanation of our Specificity Principle faces two difficult problems. The first is that in none of the contexts in (50)-(52) is the *exact time* of the event directly relevant to the purposes of the conversational exchange. Note that, in its classic formulation above, the Maxim of Quantity only requires speakers to be as informative "as is *required* for the purposes of the exchange." Consequently, if the demands of the conversation do not require some piece of information, then (55) does not require speakers to provide it. Given that in contexts (50)-(52), it isn't directly relevant whether the event occurred recently, today, or just a few moments ago, the Maxim of Quantity in (55) would not be sufficient to force the speaker to use the strongest possible TRM in those contexts.

To see this in more detail, let us consider first the context in (50). In this context, all that is required for a DVD player is that a TV have been purchased at some time during the year. Intuitively, then, whether the purchase happened today, yesterday, or weeks ago isn't directly

relevant to the addressee of the speaker's utterance. Consequently, in context (50), any of the following English sentences could be felicitously asserted.

(57)   **English Sentences Felicitous in Context (50)**

    a.   <u>Unrestricted Past Tense Reference (*cf.* Remote Past (50c))</u>
           I bought a TV, and I would like a DVD player.

    b.   <u>Restriction to 'Recent Times' (*cf.* Near Past (50b))</u>
           I bought a TV **recently**, and I would like a DVD player.

    c.   <u>Restriction to Times During 'Today'</u>
           I bought a TV **today**, and I would like a DVD player.

    d.   <u>Restriction to Times During 'This Morning'</u>
           I bought a TV **this morning**, and I would like a DVD player.

Of course, the felicity of all these sentences is correctly predicted by the Gricean Maxim of Quantity in (55), precisely because that maxim only requires the speaker to provide as much *relevant* information as their knowledge allows. Therefore, we find that the maxim in (55) will *not* be sufficient to rule out the use of the parallel Gĩkũyũ sentences in (50b,c). Moreover, an identical argument could also be made from the fact that both the English sentences in (57a) and (57b) would be felicitous in context (51).[28] Finally, consider the context in (52). Intuitively, the addressee in this context merely wants to know *where* Mwangi has gone; the time of Mwangi's departure is not directly relevant to the conversational exchange. Consequently, the classic Gricean maxim in (55) correctly predicts that both the English sentences in (58) are felicitous in this context, and so (55) cannot alone predict the *infelicity* of the Gĩkũyũ sentence in (52b).

(58)   **English Sentences Felicitous in Context (52)**

    a.   <u>Unrestricted Past Tense Reference:</u>   Mwangi went to the store.
    b.   <u>Restriction to 'Immediate Past' Times:</u>   Mwangi just went to the store.

    For these reasons, it is doubtful that the general pragmatic principle in (55) can explain the sharp contrasts seen in (50)-(54).[29] A second, more acute, problem for such a 'Gricean' analysis concerns the contrasting behavior of temporal adverbs in Gĩkũyũ. Unlike the TRMs, Gĩkũyũ's temporal adverbs are *not* subject to the Specificity Principle in (49). That is, as shown

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[28] Similarly, note that the contrast between the English data in (48) and the Gĩkũyũ data in (38) provide further motivation against attempting to derive (49) from (55).

[29] For similar reasons, Hayashi (2011: 53-54) ultimately rejects her own Gricean analysis of the parallel data in South Baffin Inuktitut. In the end, Hayashi stipulates a principle similar to our 'Specificity Principle' (49), and leaves open the problem of explaining that principle in terms of more general mechanisms (Hayashi 2011: 53-54). It is hoped that the formal analysis developed for Gĩkũyu in Section 4.3 might help to resolve these questions for Inuktitut as well.

below, when the temporal location of the event is restricted by an *adverb*, Gĩkũyũ speakers are free to make assertions that are logically weaker than what their knowledge allows for.

(59)   **No Specificity Principle With Temporal Adverbials in Non-Finite Clauses**

Situation: Mwangi was planning a trip to New York for a long time. He was supposed to leave yesterday evening, but found out at the last minute that his flight was cancelled. He's now stuck at home, and feeling very disappointed. You know all this. Your friend Kamau asks why Mwangi looks so glum. You answer:

Mwangi	nĩarendaga
Mwangi	nĩ-a-ra-end-aga
Mwangi	ASRT-3sgS-NRP-want-PST.IMPF

gũthie	New York	(ira)	/	(ira	hwainĩ) …
gũ-thi-a	New York	(ira)	/	(ira	hwainĩ)
INF-go-FV	New York	yesterday	/	yesterday evening	

Mwangi wanted to go to New York (yesterday / yesterday evening)… (but his flight was cancelled)

Judgment: Sentence is felicitous either with or without *ira* 'yesterday'

Sentence is felicitous either with or without *ira hwainĩ* 'yesterday evening'

The context in (59) is one where the speaker knows that Mwangi's desired time of departure was yesterday evening. Importantly, in this context, the speaker can choose to be maximally informative, by including the adverbial phrase *ira hwainĩ* 'yesterday evening'. However, they are also free to be less informative, by including simply the adverbial *ira* 'yesterday', or no adverbial at all. Thus, the data in (59) show that our Specificity Principle in (49) is correctly restricted to the TRM prefixes, and does not seem to apply to *all* temporal modifiers. Unfortunately, it isn't clear how a Gricean explanation deriving (49) from (55) would successfully distinguish between the TRMs in (50)-(54) and the temporal adverbials in (59).[30] To put it differently, given that the exact time of the event is not conversationally relevant in (50)-(54) or (59), the Maxim of Quantity in (55) correctly predicts the optionality seen in (59), but fails to predict the contrasts in (50)-(54).

The initial appeal of predicting the data in (50)-(54) from the Quantity Maxim in (55) was the similarity between those data and classic 'scalar implicatures' like (56). However, there is another class of cases that resemble the data in (50)-(54), where the possibility of a 'more specific' form serves to block use of a 'less specific' form. One such case is the use of dual number in languages like Slovenian. As illustrated below, if it is known that some plurality is a

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[30] However, as suggested by a reviewer, one possibility might be that the TRMs in (50)-(54) form a so-called 'Horn Scale' while the temporal adverbials in (59) do not. Unfortunately, without a greater understanding of when lexical items compete within a Horn Scale (and when they do not), this approach would seem to be more stipulative than the account developed below.

pair of entities, then speakers must use the dual number form to refer to that plurality (60a), and use of plural number is not acceptable (60b), *even if the exact number of the entities is not conversationally important.*

(60)   **Dual Number and Plural Number in Slovenian (Dvořák & Sauerland 2006)**

   Situation: The addressee is two individuals.

   a.   Kaj   sta   délala   vcéraj   zvecér?
         what   be.2**DU**   work.**DU**   yesterday   evening
         What have you done yesterday evening?

   b.   # Kaj   ste   délali   vcéraj   zvecér?
            what   be.2**PL**   work.**PL**   yesterday   evening

Importantly, it has been argued that – despite their superficial similarity to 'scalar implicatures' – cases like (60) are not to be derived from the Gricean Quantity Maxim in (55). Rather, such cases have been claimed to be 'anti-presuppositions', and are derived from a separate, general principle dubbed 'Maximize Presupposition'.

   Given the similarity between such 'anti-presuppositions' and the data in (50)-(54) – as well as the inability to analyze those data in terms of scalar implicature – I will in the remainder of this paper pursue a formal analysis that derives our 'Specificity Principle' in (49) from the more general principle of 'Maximize Presupposition'.

4.3   The Formal Semantics of Gĩkũyũ TRMS, and 'Maximize Presupposition'

In this section, I will put forth a formal semantics of Gĩkũyũ TRMs, one that relates the data from Section 4.2 to the principle 'Maximize Presupposition'. The analysis rests on two main proposals, a semantic one and a syntactic one. To begin with the former, I will provide a semantics for the TRM prefixes under which they are partial identity functions, akin to the denotations assumed for tense in (17). Unlike tenses, however, the Gĩkũyũ TRMs will denote identity functions on *events*, rather than times. To illustrate with the simplest case, I propose that the TRM feature CUR – found both in Current Past and Current Future forms – has the semantics in (61), where I use the symbol '∞' to mean 'overlap'.

(61)   **The Semantics of the TRM 'Current' (Past/Future)**

   $[[\text{CUR}]]^{g,t}$ = $[\lambda e : T(e) \infty \text{ day surrounding t . e }]$

Under the semantics above, CUR denotes an identity function on events, whose domain is restricted to those events whose time $T(e)$ overlaps the day surrounding the evaluation time t (*i.e.,* the Utterance Time).[31] In a moment, we will see how this denotation will, when combined

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[31] The motivation for appealing to 'overlap' in the semantics of TRMs, rather than 'containedness', will become clear in Section 4.4.

with the background assumptions from Section 3, predict the observed semantics of Current Past and Current Future verbs.

Next, I turn to the semantics of Near Past and Immediate Past. As noted in Section 2, both these forms have highly variable, context dependent meanings. Unfortunately, a sophisticated treatment of their context dependency (and 'vagueness') will be beyond the scope of this paper.[32] Instead, my analysis will appeal to the functions in (62) below.

(62)   **The Functions 'IMPST' and 'REC'**

    a.   IMPST(t):
        A function from temporal intervals to temporal intervals. Maps interval t to an interval $[t'...t'']$, where t', $t'' < t$, and both lie within the day surrounding t.

        (i)   *Illustration:*
            IMPST('12PM; 5/31/12')   =   ['11AM; 5/31/12 … '11:30AM; 5/31/12']

    b.   REC(t):
        A function from temporal intervals to temporal intervals. Maps interval t to an interval $[t'...t'']$, where $t' < t$ and lies before the day surrounding t, and t'' is the endpoint of the day surrounding t.

        (i)   *Illustration:*
            REC('12PM; 5/31/12')   =   ['3PM; 5/27/12' … '11:59PM; 5/31/12']

As stated above, the function 'IMPST' maps a temporal interval t to an interval preceding it but lying within the same day. The function 'REC' maps a temporal interval t to an interval containing the day surrounding t and extending to times preceding that day. With these functions at hand, we can provide the semantic entries in (63) for 'Immediate Past' and 'Near Past'.

(63)   **The Semantics of the TRMs 'Near Past' and 'Immediate Past'**

    a. $[[\text{ IMM }]]^{g,\,t}$ = $[\,\lambda e : T(e) \propto \text{IMPST}(t)\,.\,e\,]$

    b. $[[\text{ NRP }]]^{g,\,t}$ = $[\,\lambda e : T(e) \propto \text{REC}(t)\,.\,e\,]$

Under this semantics, both IMM and NRP denote partial identity functions on events. The domain of 'IMM' is restricted to those events whose times overlap the interval that the function IMPST returns for the evaluation time (Utterance Time). Similarly, the domain of 'NRP' is restricted to those events whose times overlap the interval that REC returns for the UT. Note, then, that the domain of 'IMM' is a strict subset of the domain of 'CUR', which is in turn a strict subset of the domain of 'NRP'.

Finally, let us consider the Remote Past and the Remote Future. Although we have thus far distinguished these two TRM categories, I will henceforth explore the view that these are actually one and the same formal feature, with the denotation in (64).

(64)   **The Semantics of the TRM 'Remote' (Past/Future)**

$[[\text{ REM }]]^{g,\,t}$ = $[\ \lambda e : e\ ]$

Under this view, the morphological differences between Remote Past and Remote Future verbs are due to some kind of contextually allomorphy.[33] Underlyingly, both verbal forms contain the same TRM feature, REM, which denotes an *unrestricted* identity function on events. Consequently, the domains of 'IMM', 'CUR', and 'NRP' are all strict subsets of the domain of 'REM'.

In addition to the semantic proposals above, our account will rest upon the following, key syntactic hypothesis.

(65)   **The Syntax of Gĩkũyũ TRMs**

Gĩkũyu TRMs are adjoined to the event argument 'e_j' in the specifier of AspP.

This syntactic proposal will receive more extended discussion and defense in Section 5. For the moment, however, it is worth recalling that tense features such as 'PST' are assumed to be adjoined to the pronoun T, and thereby serve to restrict the location of the Topic Time (16), (27). The hypothesis in (65) states that TRMs have a similar syntactic status: they are partial identity functions adjoined to the event argument. Thus, the claim is that TRMs are the equivalent of tense features for the event pronoun 'e_j'. They introduce presuppositions that must be satisfied by 'e_j', and – given their assumed denotations (61)-(64) – they thereby serve to restrict the location of the Event Time.

Putting these hypotheses together, the sentence in (66a) below is assumed to have the LF in (66b), and thus the truth-conditions in (66c). Furthermore, given the general equivalence in (32), it follows that the truth-conditions in (66c) are equivalent to those in (66d).
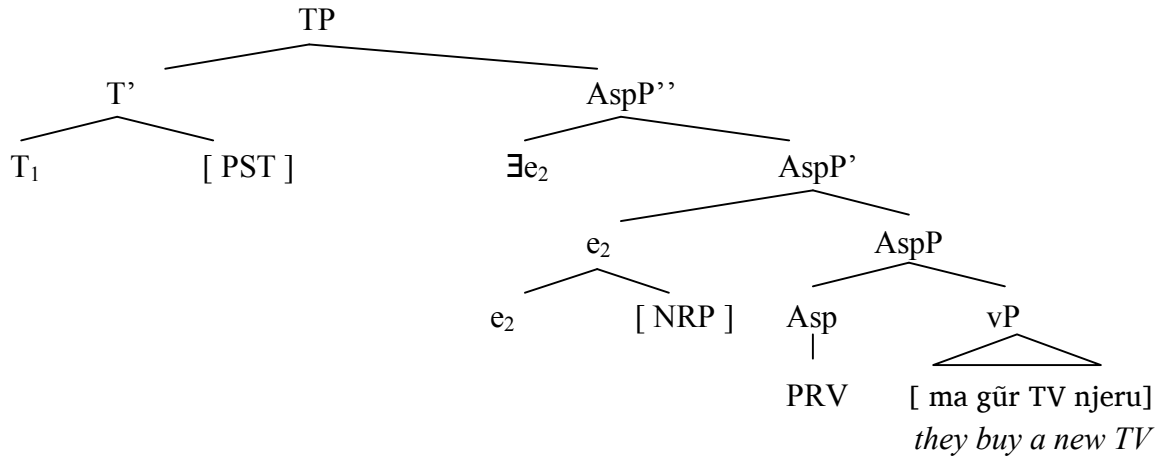
(66)   **The Syntax and Semantics of 'Near Past' in Gĩkũyũ[34]**

a.	<u>Sentence:</u>	Nĩma**ra**gũrire	TV	njeru!
		ASRT-3plS-**NRP**-buy-PST.PRV	TV	new
		They bought a new TV!		

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[33] For example, if we assume a Distributive Morphology architecture, we could assume that the grammar of Gĩkũyũ contains the following two Vocabulary Insertion rules.
    (i)   [REM] ➔ /ka/   / ____ [FUT]
    (ii)   [REM] ➔ /a/   (otherwise)
[34] I will remain agnostic as to how the surface morphological structure of the verb in (66a) is related to the syntactic structure in (66b).

b.   <u>LF Structure:</u>

```
                              TP
                ┌──────────────┴──────────────┐
               T'                            AspP''
          ┌─────┴─────┐               ┌───────┴────────┐
         T₁        [ PST ]           ∃e₂             AspP'
                                            ┌──────────┴──────────┐
                                           e₂                   AspP
                                      ┌─────┴─────┐        ┌──────┴──────┐
                                     e₂       [ NRP ]     Asp            vP
                                                           │          ┌───┴───┐
                                                          PRV    [ ma gũr TV njeru]
                                                                  they buy a new TV
```

c.   <u>Truth-Conditions, Direct Statement</u>
[[TP]]^{g,t} is defined only if $g(1) < t$; if defined, then it is T *iff:*

$\exists e$. $g(1) \supset T$ (**[λe' :** T**(e')** ∞ **REC(t) . e']**(e)) &
                 buy(e) & Agent(e) = 'them' & Theme(e) = 'new.TV'

d.   <u>Truth-Conditions, Equivalent Statement (See (32))</u>
[[TP]]^{g,t} is defined only if $g(1) < t$; if defined, then it is T *iff:*

$\exists e$. $g(1) \supset T(e)$ & T**(e)** ∞ **REC(t)** & buy(e) & Agent(e) = 'them' & Theme(e)= 'new.TV'

Since the pronominal sister to the TRM is existentially bound, the general equivalence in (32) entails that the (local) presupposition introduced by the TRM is effectively a further restriction on the scope of the existential quantifier.[35] Consequently, in the interests of simplicity, I will

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[35] Note that, for this reason, the content of the TRM is *not* predicted to 'project' in the way that presuppositional content typically does. In particular, our semantics does not predict that a Near Past TRM requires that some 'recent' past time already be salient in the context. Consequently, the empirical argument that TRMs possess the proposed 'presuppositional' semantics will necessarily be rather indirect. It will rest on the fact that such a semantics allows us to derive the Specificity Principle in (49) from the principle of Maximize Presupposition, and that such an account fairs better than one seeking to derive (49) from the Gricean Quantity Maxim in (55).

    Relatedly, a reviewer asks whether Gĩkũyũ TRMs can introduce *new* information into the discourse. For example, they ask whether TRMs can supply the answer to wh-questions, and so whether discourses like the following are possible:

(i)   a.   **Wagũrire**   rĩ   TV iyo?
                  2sgS-**REMP**-buy-PST.PRV   when   TV that
                  When did you buy that TV?
        b.   **Ndĩragũrire**   TV iyo.
                  1sgS-**NRP**-buy-PST.PRV   TV that
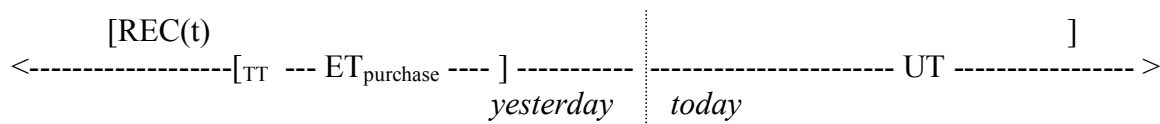   *I bought that TV (recently).*

As it turns out, speakers reject discourses like the above, but for reasons unrelated to the semantics of the TRM. Given their prefixal status, TRMs cannot themselves bear (new information) focus. Consequently, discourses like that in (i) are highly unnatural, and are best repaired as follows:

henceforth present the truth-conditions predicted by our theory as is done in (66d), with the presuppositional content of the TRM serving as a restrictor to the scope of the operator '∃e'.
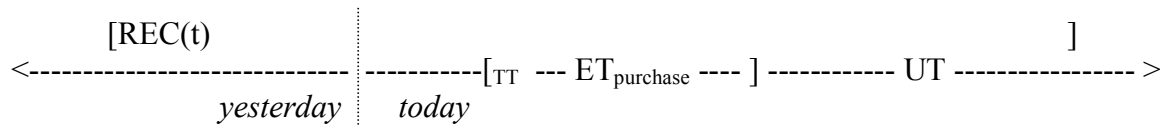
Looking to (66d), we find that our analysis predicts (66a) to have a defined meaning only if the Topic Time, $g(1)$, precedes the Utterance Time t. Moreover, we predict that – when defined – (66a) will be true *iff* there is an event e of 'them buying a TV', whose Event Time $T(e)$ is contained within the Topic Time and *overlaps the interval that 'REC' assigns to the Utterance Time.* Consequently, our semantics predicts that (66a) will be true in either of the situations schematically represented below.

(67)   **Situations Verifying Sentence (66a)**

a.   <u>Purchase of TV Occurred Prior to the Day of Speaking:</u>

```
[REC(t)                                                                          ]
<-------------------[TT --- ETpurchase ---- ] ----------- |---------------------- UT ---------------- >
                              yesterday       | today
```

b.   <u>Purchase of TV Occurred *On* the Day of Speaking</u>

```
[REC(t)                                                                          ]
<---------------------------- |----------[TT --- ETpurchase ---- ] ----------- UT ---------------- >
              yesterday       | today
```

That is, as shown above, our semantics predicts that (66a) will be true *either* if the purchase happened on the day of speaking *or* one day prior. The reader will note that this prediction results from our definition of the 'REC' function in (62), whereby the interval it returns for any time t properly contains the day surrounding t. Finally, we see that this result in (67) itself predicts the felicity of (38a) in context (38). After all, in this context, the speaker knows that the purchase of the TV happened *either* on the day of speaking or one day prior. Consequently, their knowledge entails the truth of (66a)/(38a), and so this sentence can be felicitously asserted.[36]

In a similar way, the reader can confirm that our analysis correctly predicts the felicity of sentence (35a) in context (35), and that of sentence (40a) in context (40). More generally, our semantics predicts that the Gĩkũyũ TRMs make the truth-conditional contributions highlighted below.

(ii)	a.	**Wa**gũrire	rĩ	TV iyo?
		2sgS-**REMP**-buy-PST.PRV	when	TV that
		When did you buy that TV?		
	b.	Nd**ĩra**gũrire	TV iyo	**ira.**
		1sgS-**NRP**-buy-PST.PRV	TV that	**yesterday.**
		I bought that TV yesterday.		

[36] In the interests of space, I will not provide a formal analysis of the parallel 'when questions' in (34), (37), and (40). The analysis of these interrogatives does not differ importantly from that of the corresponding declarative sentences. The only difference is that, with the interrogatives, the felicity of the utterance depends upon whether the speaker's knowledge entails that there is a true answer to the question.

(68) **The Predicted Truth-Conditional Contributions of the TRM Categories** [37]

    a.   <u>Immediate Past:</u>   Mwangi   nĩāin**a**.
                              Mwangi   ASRT-3sgS-**IMM.PST.PRV-**dance-**FV**
                              Mwangi (just) danced.

        Sentence is defined (relative to g, t) only if $g(1) < t$. If defined, it is true *iff*
        $\exists$e. $g(1) \supset T(e)$ & ***T(e)** ∞ **IMPST(t)**** & dance(e) & Agent(e) = Mwangi

        There is an event of Mwangi dancing, **whose Event Time overlaps the 'immediate past' of the Utterance Time t.**

    b.   <u>Current Past:</u>   Mwangi   nĩain**ire**.
                                Mwangi   ASRT-3sgS-**CUR**-dance-**PST.PRV**
                                Mwangi danced (within the day).

        Sentence is defined (relative to g, t) only if $g(1) < t$. If defined, it is true *iff*
        $\exists$e. $g(1) \supset T(e)$ & ***T(e)** ∞ **day surrounding t**** & dance(e) & Agent(e) = Mwangi

        There is an event of Mwangi dancing, **whose Event Time overlaps the day surrounding the Utterance Time t.**

    c.   <u>Near Past:</u>   Mwangi   nĩa**rain**ire.
                              Mwangi   ASRT-3sgS-**NRP**-dance-**PST.PRV**
                                Mwangi danced (before today, but recently).

        Sentence is defined (relative to g, t) only if $g(1) < t$. If defined, it is true *iff*
        $\exists$e. $g(1) \supset T(e)$ & ***T(e)** ∞ **REC(t)**** & dance(e) & Agent(e) = Mwangi

        There is an event of Mwangi dancing, **whose Event Time overlaps the 'recent past' of the Utterance Time t (including the day surrounding t)**

    d.   <u>Remote Past:</u>   Mwangi   nĩāin**ire**.
                                Mwangi   ASRT-3sgS-**REMP**-dance-**PST.PRV**
                                Mwangi danced (some time ago; not recently).

        Sentence is defined (relative to g, t) only if $g(1) < t$. If defined, it is true *iff*
        $\exists$e. $g(1) \supset T(e)$ & dance(e) & Agent(e) = Mwangi

        There is an event of Mwangi dancing, **whose Event Time occurs somewhere in the past.**

---

[37] Note that the truth-conditions in (68) all assume an LF where the tense node T bears the index '1', as in (66b).

e. <u>Current Future:</u> Mwangi ñie**kũ**ina.
                         Mwangi ASRT-3sgS-**CUR-FUT**-dance-**FV**
                         Mwangi will dance (within the day; or soon).

Sentence is defined (relative to g, t) only if $g(1) \supseteq t$. If defined, it is true *iff*
$\exists$e. $g(1) < T(e)$ & ***T(e) ∞ day surrounding t*** & dance(e) & Agent(e) = Mwangi

There will be an event of Mwangi dancing, **whose Event Time overlaps the day surrounding the Utterance Time t.**

f. <u>Remote Future</u> Mwangi ñia**ka**ina.
                         Mwangi ASRT-3sgS-**REMF-FUT**-dance-**FV**
                         Mwangi will dance (some time after today).

Sentence is defined (relative to g, t) only if $g(1) \supseteq t$. If defined, it is true *iff*
$\exists$e. $g(1) < T(e)$ & dance(e) & Agent(e) = Mwangi

There will be an event of Mwangi dancing, **whose Event Time occurs somewhere in the future.**

We find, then, that despite our 'presuppositional' treatment in (61)-(64), the semantic contribution of the TRMs can be ordered in terms of logical strength, whereby a 'Remote Past' sentence is weaker than a corresponding 'Near Past' sentence, which is weaker than a 'Current Past' sentence, which is itself weaker than an 'Immediate Past' sentence.[38] Recall, however, that this general view seems to be in conflict with the data in (38c) and (50)-(54). After all, as the reader can confirm, the Remote Past sentence in (38c) will be predicted to have the truth-conditions in (69) below, which are certainly entailed by the speaker's knowledge in context (38). Why, then, is an assertion of (38c) considered so sharply incorrect by speakers? Does our analysis still require appeal to the extraneous 'Specificity Principle' in (49)?

(69) **Truth-Conditions Predicted for Sentence (38c)**

Sentence is defined only if $g(1) < t$; if defined, then it is T *iff:*
$\exists$e. $g(1) \supset T(e)$ & buy(e) & Agent(e) = 'them' & Theme(e)= 'new.TV'

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[38] A reviewer asks about the possibility of the following, alternate treatment of TRMs. Consider the semantics for (*e.g.*) 'Near Past' in (i) below. Under this semantics, the TRM is an <εt, εt> modifier of the vP, which serves to introduce a further restriction on the domain of the vP.

    (i) [[NRP]]^{g,t} = [λP$_{<\varepsilon t>}$: λe : ***T(e) ∞ REC(t)*** . & P(e)]

As the reader can confirm, this semantics will still derive the truth-conditions in (66d) and (68c). Moreover, as the reviewer notes, this treatment would be consistent with a (more conservative) system where the Davidsonian event argument is *not* syntactically projected, and where the 'existential closure' of the event argument position is accomplished by the lexical semantics of the Aspect heads.

    While this is an important alternative to consider, there is one significant problem facing its adoption here. As is shown below, the account developed in (61)-(65) is able to derive the Specificity Principle in (49) from the principle of Maximize Presupposition in (70). However, as the reader can confirm, this will not be possible under the semantics illustrated in (i), simply because the domains of the various TRMs will be identical.

Happily it does not. Given the presuppositional semantics in (61)-(64), all the action of the 'Specificity Principle' actually follows from the more general condition 'Maximize Presupposition' (Heim 1991, Percus 2006, Chemla 2008, Sauerland 2008, Singh 2011, Bade 2012, Schlenker to appear). Although there are numerous formulations of this principal, the following will suffice for our purposes.

(70) **Maximize Presupposition (MP)**

Suppose that the following holds:
   a. LF_1 and LF_2 are identical, except that LF_1 contains lexical item α where LF_2 contains lexical item β
   b.   The domain of $[[\alpha]]$ is a strict subset of the domain of $[[\beta]]$ [39]
   c.   A speech act using either LF_1 or LF_2 would be licit in context [40]
If all these conditions hold, then the speech act must be made with LF_1, not LF_2

I should note, however, that the formulation in (70) does not perfectly correspond to independent formulations of 'Maximize Presupposition' (Singh 2011). Moreover, one potential issue with (70) is the vagueness of (70c). Whereas earlier formulations of MP appeal to the logical or 'contextual' equivalence of LF_1 and LF_2, for various technical reasons these notions will not be of use to us here.[41] For this reason, we will employ the more informal statement of MP in (70).

Unlike our 'Specificity Principle', the principle of Maximize Presupposition has a general utility within the theory of grammar. For example, it is classically used to account for contrasts such as the following.

(71) **Maximize Presupposition Drives the Use of Definites**
   a.   The sun came up.
   b.   ?? A sun came up.

According to some analyses, the truth-conditions of (71a,b) are logically equivalent. It is therefore a puzzle why (71b) should be illicit. As formulated in (70), Maximize Presupposition can provide the answer. After all, the LFs of (71a,b) are identical, except that (71a) contains the lexical item *the* while (71b) contains *a*. Moreover, the domain of $[[the]]$ is a strict subset of the domain of $[[a]]$.[42] Finally, since they are logically equivalent, an assertion of (71a) would be licit

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[39] Note that this condition amounts to the statement that the presuppositions introduced (locally) by α are *stronger* than those introduced (locally) by β.

[40] For our discussion here, I assume that assertions of declarative sentences are 'licit' in context when the speaker's knowledge entails their truth-conditions. Furthermore, I assume that a question is 'licit' when the speaker's knowledge entails that there is a true answer for it.

[41] The 'technical reasons' in question are the following. First, to capture contrasts such as those in (37a,c), we will want MP to evaluate pairs of questions. Thus, a formulation of MP in terms of 'logical' or 'contextual' equivalence will require us to develop a notion of such equivalence for questions, which would take us too far afield in the present study. Secondly – and more importantly – since the event pronoun is existentially bound, two LFs containing two different TRMs will never be logically equivalent. Therefore, a formulation of MP in terms of logical/contextual equivalence will not permit MP to regulate the identity of the TRM in a given sentence. It is for these reasons that I employ the more general – and vaguer – notion that both LFs can be 'used in licit speech acts'. Whether this formulation can be independently motivated remains a question for future work.

[42] The domain of $[[a]]$ is all $D_{<et>}$, whereas $[[the]]$ is restricted to $<et>$ predicates that are true of exactly one entity.

iff an assertion of (71b) is. Thus, the conditions in (70a-c) hold, and so MP requires that our speech act be made with (71a), the LF containing the presuppositionally stronger element *the*.[43]

 Having established its general validity, let us now examine the way in which MP in (70) predicts the contrasts in (38a,c) and (50)-(54). First, let us note that the LF structures of (38a) and (38c) are identical, except that (38a) contains NRP (see (66b)) where (38c) contains REM.

(72) **The LF Structures of (38a) and (38c)**

      [ma gũr TV njeru]
      they buy a new TV
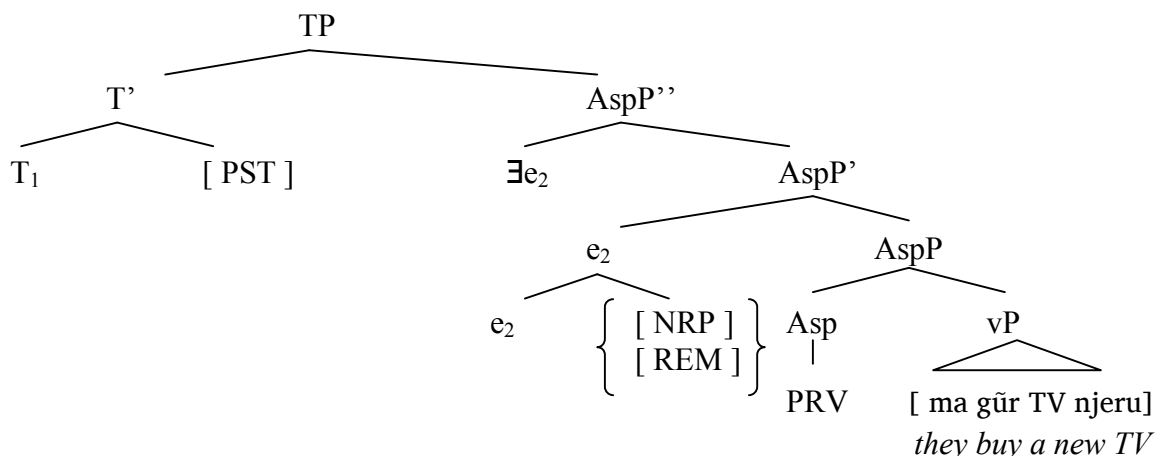
Furthermore, recall that under our semantics in (63)-(64), the domain of [[NRP]] is a strict subset of the domain of [[REM]]. Finally, in the context imagined in (38), the speaker's knowledge entails the truth-conditions of both (38a) and (38c). Therefore, in context (38), an assertion of either (38a) or (38c) would be licit. Thus, the conditions in (70a-c) hold for (38a) and (38c). Consequently, Maximize Presupposition requires that – of the two LFs – only the one in (38a) may be used to make an assertion.

 It is important to note, however, that MP in (70) will not require use of 'Near Past' in context (35). In that context, the speaker knows only that the purchase of the TV happened some time in the past; their knowledge does not entail that the purchase happened 'recently'. Consequently, an assertion of the Near Past sentence in (35b) would not be licit in the imagined context. Thus, condition (70c) does not hold of (35a) and (35b), and so MP would not require use of (35b).

 In summary, then, we find that the principle of Maximize Presupposition in (70) requires that speakers use the 'most specific' (logically strongest) TRM consistent with their knowledge. The reader is invited to confirm that this principle will therefore account for all the facts attributed to our earlier 'Specificity Principle', including the data in (50)-(54). Furthermore, it should be noted that the principle of Maximize Presupposition is in no way sensitive to whether the strengthened presuppositional content is *relevant* to the discussants' conversational goals. That is, condition (70c) only requires that the competing assertions are both 'licit', that is, that they are sincerely believed by the speaker. Consequently, even if the exact time of the event is not directly relevant to the addressee's interests in (50)-(54), Maximize Presupposition correctly

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[43] A reviewer correctly notes that this simplified analysis of (71) incorrectly predicts that a singular indefinite like 'a student' will *never* be felicitous if there is only one student in the discourse. The issue, of course, is that the definite article also includes a familiarity presupposition. In cases where the sole entity in the denotation of the NP is *not* familiar, this presupposition is not satisfied, and so (70) would not require use of *the*.

predicts that the strongest possible TRM must be used. In this way, we see that an analysis of (50)-(54) in terms of Maximize Presupposition (70) would be superior to one appealing to the Gricean Quantity Maxim (55).[44]

Finally, let us consider the differing behavior of temporal adverbials noted in (59) and repeated below.

(73) **No Specificity Principle With Temporal Adverbials in Non-Finite Clauses**

Situation: Mwangi was planning a trip to New York for a long time. He was supposed to leave yesterday evening, but found out at the last minute that his flight was cancelled. He's now stuck at home, and feeling very disappointed. You know all this. Your friend Kamau asks why Mwangi looks so glum. You answer:

| Mwangi | nĩarendaga |
| Mwangi | ASRT-3sgS-NRP-want-PST.IMPF |

| gũthie | New York | (ira) | / | (ira | hwainĩ) … |
| INF-go-FV | New York | yesterday | / | yesterday evening |

Mwangi wanted to go to New York (yesterday / yesterday evening)… (but his flight was cancelled)

Judgment: Sentence is fine either with or without *ira* or *ira hwainĩ*

As observed above, when choosing amongst temporal adverbials, Gĩkũyũ speakers are not compelled to use the most specific form consistent with their knowledge. Importantly, Maximize Presupposition in (70) would not force such a choice. After all, given our assumptions under (21) in Section 3, the two adverbs in (73) would be assumed to have the meanings below.

(74)   a. $[[\textit{ira}]]^{g, t}$ = $[\lambda t' : t' \subseteq \text{the day preceding } t]$

       b. $[[\textit{ira hwainĩ}]]^{g, t}$ = $[\lambda t' : t' \subseteq \text{the evening of the day preceding } t]$

Since temporal adverbs are assumed to all be <it>-predicates, both *ira* 'yesterday' and *ira hwainĩ* 'yesterday evening' have the same exact domain. Thus, the condition in (70b) does not hold between the LFs of the sentences in (73), and so MP as formulated in (70) would not apply.

We find, then, that unlike our original informal proposals, our formal semantics in (61)-(65) has no need of the 'Specificity Principle' in (49). Rather, all the content of that principle follows from the more general condition 'Maximize Presupposition'. Consequently, we are lead

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[44] It is also important to note that Maximize Presupposition (70) will require use of a TRM α in contexts where the speaker *strongly suspects* that the sentence containing α is true (see Footnotes 23, 24). After all, in such contexts, the sentence containing α would be a 'licit assertion'. Although assertions were earlier described as 'licit' when they are 'sincerely believed' by the speaker, this is perhaps a bit too strong. In most contexts, speakers are not faulted for asserting a proposition *p* that they 'strongly suspect' but are less than completely certain about, even if they know of potentially conflicting evidence against *p*.

to the view that, like tense features (17), Gĩkũyũ TRMs possess a 'presuppositional' semantics, whereby they are restricted identity functions.

4.4　The Importance of 'Overlap' in the Semantics of TRMs

Under the semantics proposed in (61)-(64), Gĩkũyũ TRMs require that the Event Time of the clause overlap various temporal intervals. However, one might rightly wonder why *overlap* is the topological relation chosen here. That is, one might wonder whether the minimally different lexical entries in (75) below would be more accurate.

(75)　**An Alternate Semantics for the Gĩkũyũ TRMs**

　　a.　$[[\text{ IMM }]]^{g,t}$　$=$　$[\lambda e : T(e) \subseteq \text{IMPST}(t) . e]$
　　b.　$[[\text{ CUR }]]^{g,t}$　$=$　$[\lambda e : T(e) \subseteq \text{day surrounding } t . e]$
　　c.　$[[\text{ NRP }]]^{g,t}$　$=$　$[\lambda e : T(e) \subseteq \text{REC}(t) . e]$

Under this analysis, which is in some ways conceptually simpler, the TRMs require that the Event Time *be contained in* various temporal intervals. Is there any advantage, then, to using 'overlap', as is done in (61)-(64)?

　　The principle motivation against the entries in (75) concerns the use of TRMs in describing events and states that *span the temporal intervals in question.* For example, consider the judgments below.

(76)　**The Use of 'Near Past' in Describing Events that Merely Overlap 'Recent' Times**

Situation: Our friend Wambui is having her birthday today. It is before the party, and we are discussing what each of us gave her. Our friend Kamau painted a picture of her. It's been a labor of love that he began **several months ago**. However, he just finished **yesterday**, just in time for Wambui's party.

a.　
Kamau	nĩa**ra**corire		mbica ya	Wambui
Kamau	nĩ-a-**ra**-cor-ire		mbica ya	Wambui
Kamau	ASRT-3sgS-**NRP**-make-PST.PRV	picture of	Wambui	

Kamau painted a picture of Wambui.
Judgment:　Correct in this context. Offered as translation of "Kamau painted a picture of Wambui."

b.　
Kamau	nĩ**ā**corire		mbica ya	Wambui
Kamau	nĩ-a-**a**-cor-ire		mbica ya	Wambui
Kamau	ASRT-3sgS-**REM**-make-PST.PRV	picture of	Wambui	

Kamau painted a picture of Wambui.
Judgment:　*Not* correct in this context. Would only be used if Kamau finished a while ago.

In the scenario sketched above, the event of Kamau's picture-painting spans several months and finally culminates 'yesterday'. Thus, the entire event of picture-painting is not *contained* within the 'recent past'. Consequently, the lexical entry in (75c) would fail to predict the use of 'NRP' in (76a); indeed, it would incorrectly predict that the 'Remote Past' in (76b) could be used in this scenario. However, since the picture-painting event *overlaps* the recent past, our semantics in (63b) correctly predicts the truth and felicity of (76a). Moreover, the infelicity of (76b) would again follow from Maximize Presupposition in (70).

Although an explicit treatment of generics and statives will be beyond the scope of this paper, such sentences raise similar problems for the entries in (75). For example, as first observed by Johnson (1977: 111-112), a habitual verb in the Near Past only requires that the habit *extend* into the 'recent past'. That is, given general world knowledge, the habit described by sentence (77a) is not naturally understood as being *wholly restricted* to the 'recent past', and is most naturally understood as extending back into the 'remote past'. Moreover, sentence (77b) is understood to mean that the habit ended at least two days prior to the UT.

(77)   **The Use of TRMs in Habitual Sentences (Johnson 1977: 112)**

      a.   Nia**ra**hanyũkaga.

             nĩ-a-**ra**-hanyũk-**aga**.

             ASRT-3sgS-**NRP**-run-**PST.IMP**

             He used to run (until very recently).

      b.   Nĩ**ā**hanyũkaga.

             nĩ-a-**a**-hanyũk-**aga**.

             ASRT-3sgS-**REM**-run-**PST.IMP**

             He used to run (but this habit ended at least two days ago).

Again, this is consonant with our semantics in (63b) – where 'NRP' merely requires *overlap* with the 'recent past' – and it runs counter to the semantics in (75c) – which require that the situation in question be *contained* within the 'recent past'.

Finally, consider the use of TRMs with individual-level statives, such as in (78) below.

(78)   **The Use of TRMs with Individual Level Statives**

      Situation: Yesterday, I met a really interesting guy named Mwangi. Here are some things I remember about him.

      a.   **A**ra**rĩ**   mũraihu

             a-**ra**-rĩ   mũraihu

             3sgS-**NRP**-be tall

             He was tall.

             <u>Judgment:</u>   Correct in this context. Offered as translation of "He was tall."

b. **Araĩ** wa Kenya

3sgS-**NRP**-be of Kenya

He was from Kenya.

<u>Judgment:</u> Correct in this context. Offered as translation of "He was from Kenya."

Again, in the scenario sketched above, the states in question are not *confined* to the recent past, but are most naturally understood as extending into the remote past. Nevertheless, use of the Near Past TRM is permissible (indeed, required) in this context, a fact consistent with our 'overlap' semantics in (63b) but inconsistent with the alternative in (75c).[45]

For these reasons, it seems that the meanings of Gĩkũyũ TRMs require that certain temporal intervals *overlap* the event/state described, rather than contain it completely, a fact reflected in our lexical entries in (61)-(64).

5. Temporal Remoteness Morphemes and Event Time

Our formal analysis of Gĩkũyũ TRMs consists of two key claims: (i) TRMs have a presuppositional semantics akin to tenses (61)-(64), and (ii) TRMs are modifiers of the Davidsonian event argument 'e_j', rather than the Tense node (65). In the previous section, we defended the claim in (i). In this section, we turn to the question of where in the clause the TRM features appear.

To begin, let us put forth the following, alternative hypothesis. As shown below, under this hypothesis, the TRMs of Gĩkũyũ truly are 'tenses' in the strict sense; they are restricted identity functions on times, which modify the T node of the clause, and thereby restrict the TT.

(79) **Temporal Remoteness Morphemes as Tenses**

    a.   <u>Semantic Hypotheses:</u> *The TRM Features are Identity Functions on Times*

        (i) $[[\text{IMM}]]^{g,t}$ = $[\lambda t' : t' \infty \text{IMPST}(t) . t']$

        (ii) $[[\text{CUR}]]^{g,t}$ = $[\lambda t' : t' \infty \text{day surrounding } t . t']$

        (iii) $[[\text{NRP}]]^{g,t}$ = $[\lambda t' : t' \infty \text{REC}(t) . t']$

    b.   <u>Syntactic Hypotheses</u> *The TRM Features are Additional Modifiers of T*

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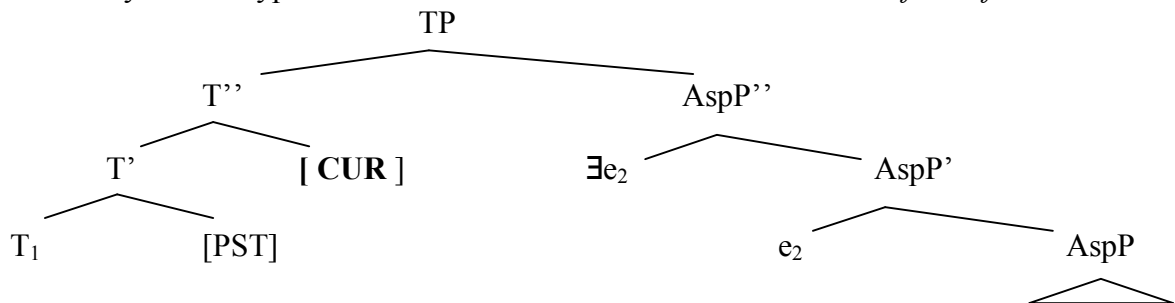
[45] The reader might wonder what prevents use of the 'Current Past' or present tense in (78b). This seems to be because the speaker here has not been in contact with Mwangi since yesterday, and so their knowledge does not entail that he is actually still alive and in possession of the states in question.

We might ask, then, what is the evidence that the alternative analysis in (79) is incorrect? What is the evidence that TRMs are *not* modifiers of the Topic Time?

As noted by others (Demirdache & Uribe-Etxebarria 2004), it is generally difficult to determine whether a given element restricts the TT or the ET, particularly when the verb bears either imperfective or perfective aspect. Given their meaning (24), both IMP and PRV assert that the ET and the TT coincide. Therefore, in such cases, a modifier will typically apply to the TT *iff* it applies to the ET. Consequently, for most sentences, it is nigh-impossible to determine whether a given modifier is restricting the TT or the ET. Fortunately, though, one can more easily distinguish TT- *vs.* ET-modification when the verb appears in Perfect or Future forms. Crucially, the heads PERF and FUT assert that TT and ET do *not* coincide, and so it becomes possible in principle to tell whether a modifier applies to the TT or the ET.[46] Interestingly, the behavior of Gĩkũyũ TRMs in verbs bearing FUT or (especially) PERF poses problems for the view that TRMs are, like tenses, restrictors of TT. As we'll see in the sections below, the meanings of such sentences indicate that their TRMs track the location of the Event Time, not the Topic Time. Consequently, any analysis of such sentences will require the TRM to modify the event argument of the verb, as we first proposed in (65).

5.1   The Contribution of TRMs to Verbs bearing FUT

It is rather apparent that our syntactic and semantic assumptions regarding 'future tense' sentences in Gĩkũyũ require us to also assume that the TRMs in such sentences are modifiers of the Event Time. The key issue is that Current Future sentences like the following assert that the *event* in question will occur within the day of speech.

(80)   **Current Future Requires 'Present-Day' Event Time**

        Mwangi   nĩekũina.
        Mwangi   ASRT-3sgS-**CUR**-FUT-dance-FV
        Mwangi will dance.
        <u>Judgment:</u>   If someone says this, and Mwangi does *not* dance by the end of the day, then the person has made a false prediction.

Our hypothesis in (65), whereby CUR is a modifier of the event pronoun 'e$_j$', correctly predicts these core judgments. After all, the truth-conditions our system predicts are those in (81a) below. Under the assumptions in (79), however, CUR is a modifier of the T-node, and thus the TT. Consequently, this alternate proposal predicts the truth-conditions in (81b).

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[46] Note that this comment assumes the semantics for FUT in (30), where it is an aspect head, rather than a true tense. Furthermore, if 'future' were a true tense in Gĩkũyũ, then the semantics of future-tense verbs would not help us determine whether TRMs modify TT or ET. Thus, the argument in Section 5.1 rests upon the potentially controversial assumption in (30).

(81)   **Truth-Conditions of Current Future Sentences**

a.   <u>Truth-Conditions if TRM Modifies the Event Argument</u>
(80) is defined (relative to *g*, *t*) only if g(1) ⊒ *t*. If defined, it is true *iff*
∃e. g(1) < *T*(e) & ***T(e) ∞ day surrounding t*** & dance(e) & Agent(e) = Mwangi

There will be an event of Mwangi dancing, **whose Event Time overlaps the day**
surrounding the Utterance Time t.

b.   <u>Truth-Conditions if TRM Modifies the Tense Node</u>
(80) is defined (relative to *g*, *t*) only if g(1) ⊒ *t* **and g(1) ∞ day surrounding t**
If defined, (80) is true *iff*   ∃e. g(1) < *T*(e) dance(e) & Agent(e) = Mwangi

There will be an event of Mwangi dancing, **at some time following the Topic**
Time g(1) (and g(1) overlaps the day of speech).

According to our predicted truth-conditions in (81a), sentence (80) is T*iff* there is some event *e* of Mwangi dancing, and the *time of the event e* falls on the day of speech. Thus, we clearly obtain the key truth-conditional judgment for (80). The truth-conditions in (81b), however, do not make this prediction. Since the tense of (80) is presumed to be PRS, if the TRM were to modify the T node, it would only contribute the redundant information that the TT is located on the day of speech. Consequently, the truth-conditions in (81b) would hold if Mwangi danced *after* the day of speech, contrary to the reported judgments for (80).

Thus, if we apply to Gĩkũyũ 'future tense' verbs the analysis commonly used for such verbs in English, then it must be that the TRMs in such sentences are modifiers of the event pronoun 'e$_j$', and not the T-node.

5.2   The Contribution of TRMs to Verbs bearing PERF

In Section 2, we saw that TRMs can – but need not – appear in verbs bearing perfect aspect. To recall, verbs bearing only perfect aspect (8a) will be referred to as 'simple perfects', while those bearing perfect aspect and a TRM will be referred to as 'complex perfects' (8b-d). In this section, we will see that the semantics of complex perfects demonstrates that the TRMs in such sentences restrict the ET rather than the TT.

Let us begin by noting that, as past scholars have observed (Barlow 1951; Johnson 1977, 1980, 1981), the 'perfect' of Gĩkũyũ is quite analogous to that of English. It seems to admit of the full panoply of uses noted for the English perfect, including the so-called 'Resultative Perfect' and the 'Continuative Perfect' (Portner 2003). Consequently, I will assume that the semantics proposed for the English perfect in (24c) also extends to the perfect of Gĩkũyũ.

In reference works on Gĩkũyũ, simple perfects like (8a) are often described as present perfects, while the complex perfects in (8b-d) are described as past perfects (Barlow 1951; Johnson 1977, 1980, 1981). While this equivalence is not exact, it is the case that speakers often translate English present perfects as simple perfects, as illustrated below.

(82) **Present Perfect in English Translated as Gĩkũyũ Simple Perfect**

Situation: Mwangi went on a trip to Washington D.C. He is now back and telling everyone stories of his visit. He mentions that, on his trip, he got to meet Barack Obama. You all cry out in disbelief. In the next room, Kamau hears the commotion. He walks over and asks what is up. You answer:

Mwangi	nĩacemanĩtie	na	Barack Obama!
Mwangi	nĩ-a-cemani-**ĩte**	na	Barack Obama
Mwangi	ASRT-3sgS-meet-**PERF**	with	Barack Obama

Mwangi has met Barack Obama!

On the other hand, as illustrated below, speakers also sometimes offer *complex* perfects as translations of English present perfects. Note in particular how the slight variations in the associated story affect the translation of the English present perfect.

(83) **Present Perfect in English Translated as Gĩkũyũ Complex Perfect**

a. <u>Situation:</u> Mwangi went on a trip to Washington D.C. He is now back and telling everyone stories of his visit. He mentions that **this morning, before he returned,** he got to meet Barack Obama. You all cry out in disbelief. In the next room, Kamau hears the commotion. He walks over and asks what is up. You answer:

Mwangi	nĩe**gũ**cemanĩtie	na	Barack Obama!
Mwangi	nĩ-a-**kũ**-cemani-**ĩte**	na	Barack Obama
Mwangi	ASRT-3sgS-**CUR**-meet-**PERF**	with	Barack Obama

Mwangi has met Barack Obama!

b. <u>Situation:</u> Mwangi went on a trip to Washington D.C. He is now back and telling everyone stories of his visit. He mentions that **yesterday** he got to meet Barack Obama. You all cry out in disbelief. In the next room, Kamau hears the commotion. He walks over and asks what is up. You answer:

Mwangi	nĩa**ra**cemanĩtie	na	Barack Obama!
Mwangi	nĩ-a-**ra**-cemani-**ĩte**	na	Barack Obama
Mwangi	ASRT-3sgS-**NRP**-meet-**PERF**	with	Barack Obama

Mwangi has met Barack Obama!

c. <u>Situation:</u> Mwangi went on a trip to Washington D.C. He is now back and telling everyone stories of his visit. He mentions that **several days ago** he got to meet Barack Obama. You all cry out in disbelief. In the next room, Kamau hears the commotion. He walks over and asks what is up. You answer:

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Mwangi	nĩ**ā**cemanĩtie		na	Barack Obama!
Mwangi	nĩ-a-**a**-cemani-**ĩte**		na	Barack Obama
Mwangi	ASRT-3sgS-**REM**-meet-**PERF**		with	Barack Obama

Mwangi has met Barack Obama!

In each of the examples above, an English present perfect is translated as a complex perfect.[47] More interestingly, the identity of the TRM in the translation appears to depend upon the time of Mwangi's meeting with Barack Obama. When the meeting occurs on the day of the utterance, 'Current Past' is used (83a); when it occurs the day before the utterance, 'Near Past' is used (83b); when it occurs several days before, 'Remote Past' is used (83c).

This pattern provides some initial support for the claim that TRMs modify the Event Time of the clause rather than the Topic Time. Given their associated contexts – as well as their translational equivalence to English present perfects – it is likely that the TTs in (83) are (roughly) the time of speech. Similarly, given these contexts, it is unlikely that speakers would supply a translation where the TT has shifted to the time of the meeting. Thus, one would be warranted in concluding that the TRMs in (83) track Event Time of the clause rather than the Topic Time.

Further, clearer support for this conclusion can be found in the behavior of TRMs in the translations of past perfects. Since one can explicitly indicate the Topic Time for past perfects, they provide a fertile testing ground for the key hypothesis in (65). With this in mind, consider the Gĩkũyũ translation of the story below.

(84)   **The Use of Gĩkũyũ Complex Perfects in Context**

Original Story: We planned to have a big party for Mwangi today. Yesterday, I bought decorations, and Kamau bought some food. This morning, though, we found out that Mwangi wasn't feeling well. <u>Since Kamau had already bought the food</u>, we decided to have a party for Wambui instead.

a.

Tũrabangĩte	gwĩkĩra	Mwangi	iruga	inene	ũmũthĩ
1plS-NRP-plan-PERF	INF-do.for	Mwangi	party	big	today

We had planned to have a big party for Mwangi today.

b.

Ira	nĩndĩragũrire		indũ	cia	kũgemia,
yesterday	ASRT-1sgS-NRP-buy-PST.PRV		things	of	decoration

na	Kamau	uragũra		irio	imwe. [48]
and	Kamau	3sgS-NRP-guy-FV		food	some

Yesterday, I bought decorations, and Kamau bought some food.

---

[47] Note that although it was not offered as a translation, speakers did still accept the simple perfect *nĩacemanĩtie* 'he has met' in these contexts as well.

[48] The verb *uragũra* 'he bought_NRP' is in the so-called 'consecutive form', and so does not bear the suffix –*ire* 'PST.PRV'. In brief, 'consecutive forms' are used when a given sentence is connected to prior sentences in a single discourse. I refer the reader to Barlow (1951) for more details on this phenomenon, which is common across Bantu.

c.

Ũmũthĩ	rũcinĩ	rĩ,	twakora		Mwangi
Today	morning	though	1plS-IMM.PST.PRV-discover-FV		Mwangi

ndaraigua		wega
NEG-3sgS-PRS.IMP-feel-FV		good

This morning, however, we learned that Mwangi is not feeling well.

d.

Tondũ	Kamau	**nĩarakĩgũrĩte**	irio,[49]
Tondũ	Kamau	nĩ-a-**ra**-kĩ-gũr-ĩte	irio,
because	Kamau	ASRT-3sgS-**NRP**-then-buy-PERF	food

twatua	gwĩkĩra	Wambui	iruga.
1plS-IMM.PST-PRV-decide-FV	INF-do.for	Wambui	party

Since Kamau had already bought the food, we decided to have a party for Wambui instead.

In the story above, the sentence of key interest is (84d). In both the English original and the Gĩkũyũ translation, the sentence preceding (84d) conveys the proposition that 'This morning, we found out that Mwangi wasn't feeling well.' Given this context, the Topic Time for (84d) is roughly 'this morning'. Indeed, in the original English, the past perfect 'had bought' in (84d) would commonly be taken to indicate that this TT – our moment of discovery this morning – precedes the UT and *follows* the Event Time of Kamau's purchase. Note, then, that in the Gĩkũyũ sentence in (84d), the translation of 'had bought' contains Near Past. Since the intuitive TT in (84d) falls on the day of speaking, NRP cannot be understood as modifying the TT. Instead, since the ET of (84d) *does* fall on the preceding day, NRP in this sentence must be understood as applying to the ET.

It is possible to provide even more carefully controlled examples that support the same point. Consider the judgments for the sentences below.

(85) **The Use of TRMs in Gĩkũyu Past Perfects (Pluperfects)**

Situation: Mwangi has been telling us for a while that he intends to travel to New York. Today, we went to his house to say goodbye, but unbeknownst to us at the time, he had already left yesterday.

a.

Rĩĩria	tũkinyire	gwake,	Mwangi	**nĩarathĩite.**
rĩĩria	tũ-∅-kiny-ire	gwake,	Mwangi	nĩ-a-**ra**-thi-**ĩte**.
when	1plS-CUR-arrive-P.PRV	his	Mwangi	ASRT-3sgS-**NRP**-go-**PERF**

When we arrived at his (house), Mwangi had already left.
<u>Judgment:</u> Correct in this context. Offered as translation of the English sentence.

---

[49] The semantics of the prefix *kĩ-* in the verb *nĩarakĩgũrĩte* 'he had bought' is a difficult matter. From traditional descriptions, it appears to be essentially vacuous, though it is often translatable into English as 'then' (Barlow 1951).

b. Rĩiria tũkinyire   gwake, Mwangi **nĩegũthĩite.**

rĩiria tũ-Ø-kiny-ire   gwake, Mwangi nĩ-a-**kũ**-thi-**ĩte.**

when 1plS-CUR-arrive-P.PRV his   Mwangi ASRT-3sgS-**CUR**-go-**PERF**

When we arrived at his (house), Mwangi had already left.

<u>Judgment:</u>   *Not* correct in this scenario. Would only be true if Mwangi's departure were on the day of speech.

Importantly, the contrast between (85a,b) directly supports the claim that the TRM prefixes track the Event Time of the clause, rather than the Topic Time. To begin, note that in the English translations of (85a,b), the adjoined 'when'-clause would commonly be viewed as supplying the Topic Time of the main clause. That is, for the English sentence "When we arrived at his house, Mwangi had already left", the Topic Time for the main clause would typically be taken to be the time of our arrival (this morning), while the Event Time would be the time of Mwangi's departure (yesterday). It stands to reason, then, that in the syntactically parallel Gĩkũyũ sentences (85a,b), the main clause TT is again the time of our arrival, while the ET is the time of Mwangi's departure. Consequently, the reported 'incorrectness' of Current Perfect (85b) in the scenario above demonstrates that the TRM of the main clause *cannot* be understood as modifying the TT of the sentence. Furthermore, the acceptability of Near Past Perfect (85a) in this scenario supports the view that the TRM tracks the Event Time instead.

   To put the matter more acutely, our analysis in (61)-(65) predicts the following truth-conditions for the main clauses in (85a) and (85b), respectively.
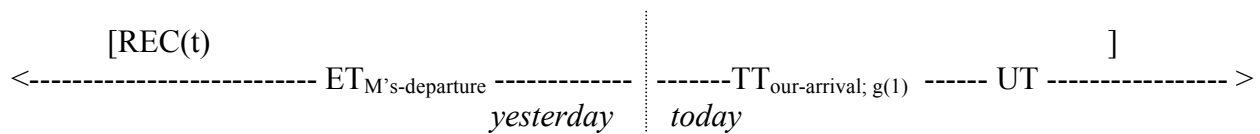
(86)   **Predictions of the System Proposed in (61)-(65)**
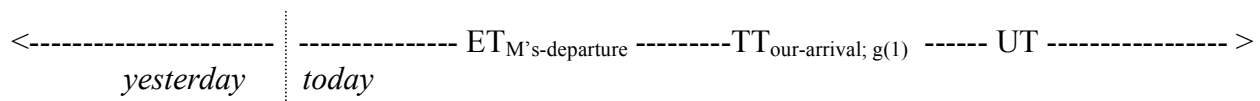
   a.   <u>Truth-Conditions for Main Clause of (85a)</u>
          $[[(85a)]]^{g,t}$ is defined only if $g(1) < t$; if defined, then it is T *iff:*

          ∃e . **_T(e) < g(1)_** & **_T(e) ∞ REC(t)_** & go(e) & Ag(e) = Mwangi
          There is an event of Mwangi leaving whose Event Time overlaps the 'recent past'

```
     [REC(t)                                                                    ]
<------------------------ ET_M's-departure ------------- -------TT_our-arrival; g(1) ------ UT ---------------- >
                           yesterday             today
```

   b.   <u>Truth-Conditions for Main Clause of (85b)</u>
          $[[(85b)]]^{g,t}$ is defined only if $g(1) < t$; if defined, then it is T *iff:*

          ∃e . **_T(e) < g(1)_** & **_T(e) ∞ day surrounding t_** & go(e) & Ag(e) = Mwangi
          There is an event of Mwangi leaving whose Event Time overlaps 'today'

```
<----------------------- --------------- ET_M's-departure ---------TT_our-arrival; g(1) ------ UT ---------------- >
      yesterday        today
```

That is, given our assumption that the TRM modifies the event argument (65), sentence (85b) entails that Mwangi left *on the day of speaking*, whereas (85a) entails only that he left in the

'recent past'. Therefore, our account correctly predicts the falsity of (85b) in its associated context, as well as the truth of (85a) in that context. Observe, on the other hand, the predictions of the alternate account in (79).
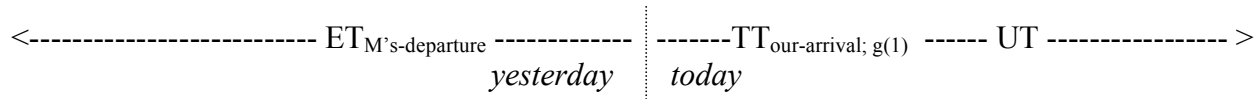
(87)   **Predictions of the Alternate 'Tense Analysis' in (79)**

Truth-Conditions for Main Clause of (85b)
$[[(85b)]]^{g,t}$ is defined only if $g(1) < t$ and **$g(1) \propto$ day surrounding t**; if defined, then T *iff*

$\exists e$. $T(e) < g(1)$ & go(e) & Ag(e) = Mwangi
There is an event of Mwangi leaving some time before the TT (today)

<--------------------------- ET$_{M's\text{-}departure}$ ------------- $\vdots$ -------TT$_{our\text{-}arrival; g(1)}$ ------ UT ---------------- >
           yesterday   *today*

As shown above, if the 'Current Past' TRM in (85b) were a modifier of the T-head, then (i) it would limit the *Topic Time* to the day of speech, and (ii) there would be no constraint on the exact location of the Event Time. Consequently, the predicted truth-conditions in (87) would *hold* in the scenario under (85), and so the alternate account in (79) incorrectly predicts (85b) to be true in that scenario. Taken together, we find that, between (61)-(65) and (79), only the former predicts the contrast in (85).

   The data in (88) and (89) below show parallel contrasts for the Remote Past. As the reader can confirm, in each case, the alternative 'tense' proposal in (79) would not predict the observed contrast, while our proposals in (61)-(65) would.

(88)   **Further Evidence that TRMs Track the Event Time, Not the Topic Time**

Situation: Mwangi has been telling us for a while that he intends to travel to New York. Today, we went to his house to say good bye, but unbeknownst to us at the time, he had already left two days ago.

 a. Rĩiria tũkinyire   gwake, Mwangi **nĩãthĩite.**
   rĩiria tũ-Ø-kiny-ire   gwake, Mwangi nĩ-a-**a**-thi-**ĩte.**
   When 1plS-CUR-arrive-P.PRV his   Mwangi ASRT-3sgS-**REM**-go-**PERF**
   When we arrived at his (house), Mwangi had already left.
   Judgment: Correct in this context. Offered as translation of the English sentence.

 b. Rĩiria tũkinyire   gwake, Mwangi **nĩegũthĩite.**
   rĩiria tũ-Ø-kiny-ire   gwake, Mwangi nĩ-a-**kũ**-thi-**ĩte.**
   When 1plS-CUR-arrive-P.PRV his   Mwangi ASRT-3sgS-**CUR**-go-**PERF**
   When we arrived at his (house), Mwangi had already left.
   Judgment: Not true this scenario. Would only be true if Mwangi's departure
        were on the day of speech.

(89)   **Further Evidence that TRMs Track the Event Time, Not the Topic Time**

Situation: Mwangi has been telling us for a while that he intends to travel to New York. Yesterday, we went to his house to say good bye, but unbeknownst to us at the time, he had already left one day earlier.

a.   Rĩĩria   tũrakinyire   gwake,   Mwangi   **nĩāthĩite.**

rĩĩria   tũ-ra-kiny-ire   gwake,   Mwangi   nĩ-a-**a**-thi-**ĩte.**

When   1plS-NRP-arrive-P.PRV   his   Mwangi   ASRT-3sgS-**REM**-go-**PERF**

When we arrived at his (house), Mwangi had already left.
(Offered as translation of original English)

b.   Rĩĩria   tũrakinyire   gwake,   Mwangi   **nĩarathĩite.**

rĩĩria   tũ-ra-kiny-ire   gwake,   Mwangi   nĩ-a-**ra**-thi-**ĩte.**

When   1plS-NRP-arrive-P.PRV   his   Mwangi   ASRT-3sgS-**NRP**-go-**PERF**

When we arrived at his (house), Mwangi had already left.
<u>Judgment:</u>   Not true this scenario. Would only be true if Mwangi's departure were one day prior to the day of speech.

Taken as a whole, the patterns observed in this section provide compelling support for the claim that TRMs are not 'tenses', in that they are not modifiers of the T-node. Rather, in a certain sense, they are the equivalents of 'tense' for the event argument 'e$_j$'. Through their modification of the event pronoun, the Gĩkũyũ TRMs directly relate the Event Time to the Utterance Time, a behavior quite different from 'tense' in languages like English.

6.   Conclusion and Outstanding Questions

The preceding sections explored in some detail the semantics of the tense-aspect system of Gĩkũyũ, a language alleged to distinguish different 'grades' of past and future tense. We have seen, however, that the morphemes traditionally labeled 'tenses' by Bantu grammarians are, at least for Gĩkũyũ, best analyzed as something distinct from – but similar to – tense in languages like English. That is, rather than being modifiers of the Topic Time, these 'temporal remoteness morphemes' are actually modifiers of the Event Time. On the other hand, we have seen that these morphemes have a strong semantic similarity to tense, in that they denote restricted identity functions that introduce presuppositions regarding the location of a temporal parameter.

We find, then, that Gĩkũyũ does not truly exhibit multiple past and future tenses. This, of course, raises the question of whether *any* language truly has such a multiplicity of tenses. At first glance, the claim that languages can exhibit more tenses than English sounds very plausible, and perhaps theoretically uninteresting. After all, there is nothing theoretically challenging about the notion that T can be modified by features other than 'PST' and 'PRS'. In Gĩkũyũ, however, this just does not seem to be the case. Although the additional features at play in Gĩkũyũ's tense-aspect system have a similar denotation to tense features, they are not features of the tense node T; rather, they are features of the Davidsonian event argument.

This suggests a rather interesting characterization of the variation between English and Gĩkũyũ, one that could be explored through study of other languages alleged to exhibit 'grades' of tense. From what we've seen, the key difference between Gĩkũyũ and English lies not in the categories of tense. Rather, it is that only Gĩkũyũ allows the event pronoun 'e$_j$' to be modified by 'tense-like' features, ones that introduce presuppositions regarding the Event Time. Thus, the picture that emerges is one where the categories of tense remain constant, and what varies is the presence or absence of similar such features associated with event argument.[50]

Therefore, the contrast between English and Gĩkũyu is interestingly parallel to the difference between English and 'tenseless' languages, such as Paraguayan Guaraní (Tonhauser 2011). Just as Paraguayan Guaraní differs from English in that its T-node is never modified by tense features, English differs from Gĩkũyũ in that its event pronoun is never modified by TRM features. With this in mind, the following general typological picture begins to come into view. Whether this picture can be corroborated by studies of other 'graded tense' systems remains to be seen.

(90) **Potential Typology of Tense-Aspect Systems**

	Features Modifing the T-Node	Features Modifying the Event Argument
English	[PRS] , [PST]	(none)
Lillooet [51]	[Non-Future]	(none)
Guaraní [52]	(none)	(none)
Gĩkũyu	[PRS], [PST]	[IMM], [CUR], [NRP], [REM]
Inuktitut [53]	(none)	[CUR], [REM]

I would like to close this discussion by noting an outstanding puzzle for the analysis defended here. According to our analysis, TRMs are features of the Davidsonian event argument, and so are in a local morphosyntactic relation with *neither* tense *nor* aspect. Curiously, however, it seems that the distribution of TRMs is indeed tied to the tense and aspect of the clause. For example, although TRMs are obligatory in Past Imperfective (3) and Past Perfective forms (7), they are optional in Perfect forms (8), and are banned from Present Imperfectives (13).[54] Furthermore, recall that the 'Immediate Past' is restricted to perfective aspect, and cannot appear with imperfectives. These curious restrictions on the combination of tense, aspect and TRM are

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[50] A reviewer asks whether one couldn't instead conclude from the data in this paper that (i) Gĩkũyũ TRMs are indeed tenses like 'past' and 'present', but (ii) Gĩkũyũ tense differs from English's in that it relates the UT to the ET directly, instead of to the TT. While this is indeed a view consistent with the data above, it necessarily assumes a different background theory of what 'tense' is cross-linguistically. Consequently, the reviewer asks whether I can offer any independent motivation for my assumed background theory of 'tense'. Unfortunately, I believe that doing so lies outside the scope of this paper. As in much work in linguistics, my argument here is ultimately conditional: *if* one shares the background assumptions here, *then* certain conclusions can be made from the data. Nevertheless, the facts presented here certainly can and should inform larger debates about the cross-linguistic nature of tense.

[51] See Matthewson (2006).

[52] See Tonhauser (2011).

[53] See Hayashi (2011).

[54] Note that there is no *semantic* reason why CUR couldn't appear in present imperfective forms.

an obvious feature of Gĩkũyũ grammar, one that has already received focused analytic attention (Johnson 1977, 1980, 1981; Hewson & Nurse 2005). It remains to be seen whether they can be understood in terms of the morphosyntax proposed here.

Acknowledgments

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