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by

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**An investigation of projection and temporal reference
in Kaqchikel**

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Tammi Leann Stout

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*To my mom, who always believed in me,
even when I forgot to believe in myself.*

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Abstract

**An investigation of projection and temporal reference
in Kaqchikel**

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This dissertation is an investigation of two categories of meaning: projective content and temporal reference. Both topics have been discussed widely in literature for better studied languages, primarily English, but have received much less attention in both formal semantics and in documentary and descriptive literature for languages that are under-studied. Using data from primary fieldwork conducted in Guatemala on the Mayan language, Kaqchikel, I contribute to the discussion of the semantics of under-studied languages by investigating linguistic expressions that trigger implications, which are said to project out of the scope of entailment canceling operators, such as negation. For the first half of the dissertation, I introduce the concepts and diagnostics to determine if an implication is projective both in English

and in Kaqchikel. I then show how the diagnostics are borne out in Kaqchikel both for projection and for at-issue meaning. I then turn to an investigation of temporal reference and provide an analysis of Kaqchikel as a tenseless language, which leads into the discussion in Ch. 6 on particles in the language with projective and temporal implications. I conclude by drawing on the results from both studies to discuss the implications for future studies both in Kaqchikel and for other languages.

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Chapter 1

Introduction

Interest in cross-linguistic patterns of linguistic phenomena has seen an increase in the past few decades as part of a shift in trends for linguistic inquiry. While much of the interest originally focused on describing and documenting understudied languages of the world, there has been a notable move in the direction of studies on the theoretical side with an increasing number of theorists using formal frameworks to analyze understudied languages of the world. This dissertation aims to describe and analyze two phenomena within the semantic and pragmatic domain, projection and temporality, in the Mayan language, Kaqchikel. This dissertation specifically focuses on the variety of Kaqchikel spoken in Sololá and surrounding aldeas, which are near Lago Atitlán.

On the surface, a study on temporal reference and projection may seem disconnected. Studies on projective content are interested in understanding which linguistic expressions trigger implications, such as presuppositions, which are unaffected when embedded under operators that target entailments and the asserted content. That is to say, embedding under negation, for instance, will alter the truth-conditions of a sentence but not the content of a projective implication. For instance, the example in (1) contains the factive predicate *-mestaj* ‘to forget’, which presupposes that the content of the complement is true in order for the overall utterance to be true. The first line is the utterance containing the factive predicate, and the content of is the implicational content triggered by the use of the factive predicate, where ‘ \Rightarrow ’ means ‘implies’.

- (1) *Ambrocia x-u-mestaj chĩ Juan k'o pan Iximche'*.
 Ambrocia PRFV-A3S-forget REL Juan EXST PRE Iximche'
 'Ambrocia forgot that Juan is in Iximche'.
 ⇒ Juan is in Iximche'

One of the common tests for projection is to embed the utterance under negation. If the implication *Juan is in Iximche'* remains unaffected, the implication is projecting out of the scope of negation.

- (2) *Ambrocia ma x-u-mestaj tä chĩ Juan k'o wawe'*.
 Ambrocia NEG PRFV-A3S-forget IRR REL Juan k'o wawe'.
 'Ambrocia didn't forget that Juan is in Iximche'.
 ⇒ Juan is in Iximche'.

in (2), the only content of the utterance that changes is the asserted content *Ambrocia xumestaj* from (1). The fact that the content of the complement of *-mestaj* is unchanged is evidence that *-mestaj* triggers an implication that is projective.

The research conducted on projection in Kaqchikel for this dissertation is modeled off of the study conducted on Paraguayan Guaraní projective content, which is explored in-depth in In a recent study comparing the projective implications for linguistic expressions in English with those in Guaraní in Tonhauser et al. (2013). In this study, they provide evidence that there are rather interesting similarities between the two languages with respect to the types of linguistic expressions triggering projective implications and how they behave in different contexts. Their results point to the need to continue studying this category of meaning for a more diverse pool of languages in order to fully understand just how robust the cross-linguistic patterns really are.

Studies on temporal reference, or the time interval that a given utterance or discourse is about, commonly aim to analyze the tense/aspect system of a language or compare systems across languages. One specific area of interest is understanding how temporal reference is established in a language that lacks the grammatical category of tense, at least on the surface (Matthewson, 2006b; Bittner, 2005; Bohnemeyer, 1998; Tonhauser, 2011; Mucha, 2013, *inter alia*). On the other side of the

temporal spectrum, some languages are said to encode more fine-grained distinctions with respect to temporal reference (Cable, 2013; Mucha, 2015; Tallman and Stout, 2016, *inter alia*), which makes for an interesting comparison of the diversity in temporal systems in the world's languages.

Both temporal reference and projection in Kaqchikel are topics on which very little work has been done. The reference grammar, Rodríguez Guaján and García Matzar (1997), makes mention of the tense/aspect/mood (TAM) system, but the goal is purely descriptive and the examples are constructed examples in absence of a context, which is a necessary component for understanding temporal reference. Other mentions of the TAM system, such as that in Guarcax González (2016), are similar in nature but they do provide a few clues in the data included in the description that suggest the possibility of Kaqchikel being tenseless. The following example from (Guarcax González, 2016, p. 32) has a verb that is marked with the perfective aspect (what many Mayanists refer to as the completive) and co-occurs with the temporal adverb *chwaq* 'tomorrow'. The expectation for a morpheme not marking tense is that the perfective should be acceptable for the past or for the future.

- (3) *Chwaq' n=k'a re' x-i-pi wawe'.*
 tomorrow PAR=PAR D PRFV-B1S-come here
 'I'll surely have come here tomorrow.'

The utterance in (3) is included as a grammatical example in Guarcax González (2016), who is also a native speaker of the Sololá dialect of Kaqchikel, but the consultants I work with reject the example as an acceptable utterance. This points to the importance of situating linguistic examples in a context. For example, the utterance in (3) might become acceptable for speakers when enough information is added to the context.

- (4) [Context: Maria needs to get some handmade bags from Sololá down to her shop in Panajachel, but she is unable to make the trip. Her friend, who lives in Sololá visits her shop that day, so she asks if he can bring them to her. He responds:]

Chwaq' n=k'a re' x-i-pi wawe'.
tomorrow PAR=PAR D PRFV-B1S-come here

'I'll surely have come here tomorrow.'

While the context in (4) is only an example, it reflects the importance of using a context to test for felicity (marked as #) or grammaticality (marked as *) for a given utterance. Using context-induced elicitations, I situated target utterances marked with different TAM morphemes to better understand the restrictions on usage in certain contexts (e.g. can they be used in a context which establishes a past temporal reference but not with future reference?). The data collected for the analysis of temporal reference is the result of original fieldwork in Sololá, Guatemala at various times between 2013-2016. Initial fieldwork work was the result of work with the primary consultant Rigoberto Choy in Austin, Texas at the University of Texas at Austin as part of a field methods course and one-on-one elicitations after the conclusion of the course.

The pool of studies on projective content in understudied languages is significantly smaller than that for temporal reference, and is non-existent for Kaqchikel specifically, which leaves a great opportunity to begin to fill this gap with data from Kaqchikel. The present study still has many gaps, which is surely the case for any study especially when the enterprise is relatively new, but the results show yet another strikingly similar pattern for projective implications between Kaqchikel, English and Guaraní.

In the midst of considering the properties of projective implications, it became evident that certain linguistic expressions, namely a set of particles, were functioning differently than I initially thought. The four particles, *chik*, *yän*, *k'a* and *na*, are in some cases responsible for triggering implications that interact with temporal reference by providing additional temporal (and in one case modal) constraints on the evaluation time of an eventuality description. At least in one instance, for *k'a*, an implication is only triggered in very specific contexts and in combination with other particles, such as *na*, which leads to the question as to what exactly the semantic contribution is for each of the particles and whether or not part of their function is actually related to triggering a projective implication or not.

The overall goals of this dissertation are to provide an introduction to the properties of projective content in Kaqchikel, provide a systematic analysis of temporal reference, and finally to provide a semantic analysis of *chik*, *yän*, *k'a* and *na* with respect to both their temporal/aspectual/modal properties and their projective properties. To address each of these goals, I focus on the following research questions for projection and temporal reference in Kaqchikel:

1. What linguistic expressions in Kaqchikel trigger implications, e.g. are presuppositional, and are the implications actually projective?
2. How is temporal reference established in Kaqchikel?
3. Is the semantic contribution of *chik*, *yän*, *k'a* and *na* presuppositional, and if so, what is the presupposition or implication associated with each particle?

This dissertation is structured as follows:

Chapter 2 provides the relevant background on projective content, which is the focus for a large body of literature on presuppositions. I also introduce two other sub-categories of meaning which trigger projective implications: conventional implicatures and non-restrictive relative clauses. The second half of the chapter provides the reader with an introduction to parts of Kaqchikel grammar needed to facilitate understanding the data for the dissertation.

Chapter 3 gives a comprehensive overview of the diagnostics used to test for projective implications using data from English to demonstrate how the tests should work. I also provide the diagnostics for two additional properties observed for different projective triggers, strong contextual felicity and obligatory local effect. I also introduce the linguistic expressions that are hypothesized to be projective in Kaqchikel, and I provide examples of the relevant embedding constructions used to test for projection in Kaqchikel.

Chapter 4 shows how the diagnostics are set up with Kaqchikel examples and provides evidence of projection for a set of linguistic expressions in Kaqchikel. One

final consideration in the chapter is at-issueness, which refers to the content of an utterance that is considered to be the main point, and projection. Projective implications cross-linguistically are observed to be not-at-issue, which leads to a possible correlation between being projective and the potential to serve as at-issue content. I provide evidence that this pattern holds for Kaqchikel projective implications as well.

In Chapter 5, I turn to the temporal domain and provide an analysis of Kaqchikel temporal reference, and I show that Kaqchikel is best analyzed as a tenseless language where interpretational preferences are just conversational implicatures that can be canceled when overridden by adverbials or by the context.

Chapter 6 builds on the temporal analysis given in Chapter 5 by considering the semantic contribution of a set of particles, which have temporal, aspectual, or modal meanings, but are also potentially projective.

I conclude in Chapter 7 with a summary of the findings in the dissertation and discuss the cross-linguistic implications as well as directions for future studies.

Chapter 2

Background

2.1 An introduction to Kaqchikel

2.1.1 The Kaqchikel language and people

Kaqchikel is part of the K'ichean branch of Eastern Mayan languages spoken in the western highlands of Guatemala. With an estimated 500,000 speakers, it is one of the more widely spoken Mayan languages in the country.¹ The Mayan language family has approximately 30 extant Mayan languages spoken throughout Guatemala, Mexico, Belize and Honduras with 21 of those languages spoken in Guatemala alone. § 2.1.1 shows the breakdown within the Mayan family (based on Kaufman (1974) and Law (2017)). Though there has been a shift toward Spanish bilingual speakers over the past century, with the signing of the Peace Accords in 1996, Mayans in Guatemala are regaining their political autonomy. As a result, younger Kaqchikel people are gaining more access to education through Kaqchikel, which also aids in the revitalization of their language and culture for the younger generations. Kaqchikel is now one of the languages taught in many classrooms in the towns and villages where it is the primary language, so both Kaqchikel and non-Kaqchikel children in those areas have access to learning both Kaqchikel and Spanish (Maxwell, 2011).

Due to the large degree of dialect variation in Kaqchikel, this dissertation focuses on data from one variety of Kaqchikel spoken in the Sololá municipality. The reference grammar by Rodríguez Guaján and García Matzar (1997) is largely based on what is considered to be a more standardized variant, which differs in some re-

¹K'ichee' has the largest number of speakers at nearly a million, which is second only to Spanish.

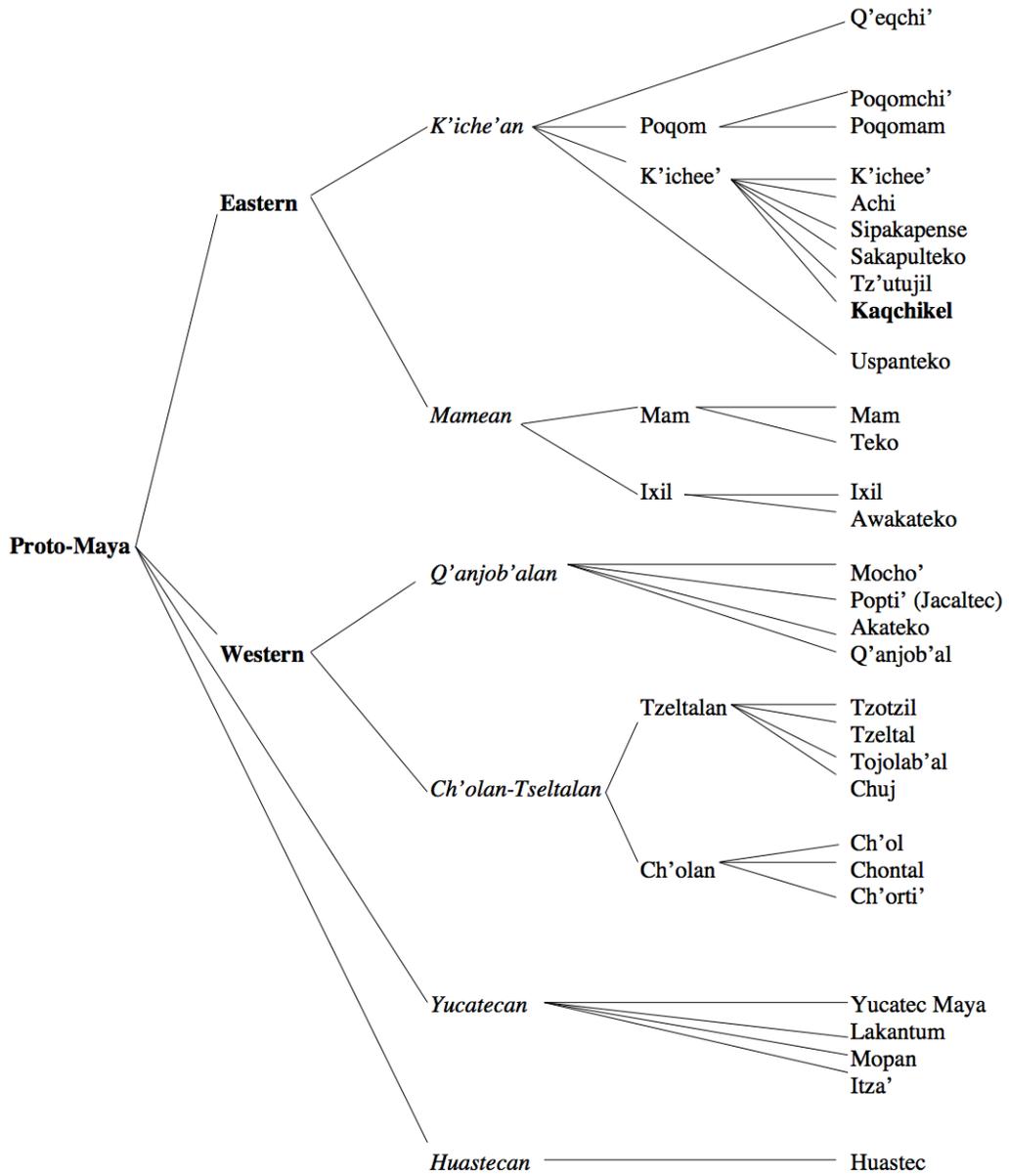


Figure 2.1: Mayan Language Family based on Kaufman (1974) and Law (2017)

spects to the Sololá dialect. While working with Sololá consultants, they would comment that some aspects of the language that I was interested in were absent from their dialect and were from the Kaqchikel spoken in Comalapa or Iximche' (the Mayan name for Tecpán). Throughout the dissertation, I make note of relevant differences as they come up, such as the embedding constructions discussed in Chapter 3 testing for projection. I also use examples from books that are based on a more standardized version of Kaqchikel, so there are also instances where there is a discrepancy between Sololá Kaqchikel and the text examples. Any results from various judgment tasks, which will be described in more detail in § 2.2, appearing in this dissertation are from Sololá speakers only.

2.1.2 Orthography and phonology

Standard Kaqchikel has 32 distinct phonemes in the language consisting of 22 consonants and 10 vowels. In this dissertation, I follow the standard orthography for Mayan languages, which was standardized by the Academia de las Lenguas Mayas de Guatemala. The consonants in Kaqchikel with the orthographic symbol that correlates to it are given in Table 2.1.

	Bilabial	Alveolar	Alveo-palatal	Palatal	Velar	Uvular	Glottal
Stops	p	t			k	q	'
Ejectives	p'	t'			k'	q'	
Implosives	b'						
Nasals	m	n					
Tap or flap		r					
Affricates		tz	ch				
Ejective affricates		tz'	ch'				
Fricatives		s	x			j	
Approximant	w				y		
Lateral approximant		l					

Table 2.1: Consonant phonemes and orthographic symbols

Though IPA (International Phonetic Alphabet) charts typically represent a voiced/voiceless distinction for consonants in pairs, the majority of consonants in Kaqchikel other than sonorants are voiceless with a glottalized counterpart rather

than a voiced consonant in the same place of articulation (e.g. alveolar) and with the same manner of articulation (e.g. stops). For instance, the voiceless alveolar stop /t/ is contrastive with the voiceless alveolar ejective /t'/, and there is no voiced alveolar stop /d/ in the language. With respect to pronunciation variation in rapidly produced natural speech, it is also quite common for speakers to reduce the bilabial implosive to a glottal stop. When this is the case, I place parentheses around the ‘b’ to indicate it is an environment where speakers tend to produce a glottal stop in rapid speech instead of the bilabial implosive.

At least in written form, Kaqchikel has 10 vowels, which are listed in Table 2.2. The vowels occur in tense/lax pairs, where the lax vowel in each pair is represented with the same vowel symbol plus the umlaut diacritic above the vowel (e.g. *ä*). Sololá is the only dialect that retains all 10 vowels. Other dialects, such as Comalapa, have a 9 vowel system where the *ë* is lost and combined with *ä*. Tecpán, on the other hand, only retains the 5 lax vowels plus *ä* (Rodríguez Guaján and García Matzar, 1997, p.5)

	Front	Central	Back
High	i <i>ï</i>		u <i>ü</i>
Mid	e <i>ë</i>		o <i>ö</i>
Low		a <i>ä</i>	

Table 2.2: Vowel phonemes and orthographic symbols

For each tense vowel in the language, there is a lax counter part, which is marked using the umlaut diacritic above the vowel. The lax vowels also constitute another environment where in natural speech, speakers reduce the vowels and essentially drop them. For the examples given in the dissertation, I also place parentheses around vowels that speakers consistently drop or are so reduced that might only be perceptible with an acoustic analysis. Also focusing on the Sololá variety of Kaqchikel, Guarcax González (2016) typically omits the vowels completely from the examples rather than representing them as optional. For my purposes, I have chosen to represent the optionally produced vowel in parentheses in examples from

my own fieldwork in order to be consistent across examples (e.g. those from my fieldwork and those from other resources).

2.1.3 Morphology and word classes

Kaqchikel word classes are fairly standard classifications of nouns, verbs, adverbs, adjectives and prepositions. There are two additional cross-linguistically non-standard morphological classes: positionals and relational nouns. The canonical syllable structure for Kaqchikel is Consonant-Vowel-Consonant (CVC), but only transitive verb roots and positional roots are restricted to a CVC structure, while other word classes, such as intransitive verb roots, nouns and adjectives, have more flexibility. As this section will show, not all word classes contain free roots, which means that the root must be inflected in order to be used grammatically. Adjectives, pronouns and nouns are among the word classes formed by free roots, while other word, or morphological, classes are bound. Kaqchikel is also a head-marking language, where all inflectional agreement morphology appears on the head of a phrase (e.g. verbs are marked for inflection in VPs and nouns are marked in NPs).

Before moving to a more detailed description of the basic word classes, I should mention that true conjunctions, such as *and* and *but* in English or *y* and *pero* in Spanish, are absent. Many speakers have borrowed *y* and *pero* (reduced to *per*) from Spanish and use it quite productively. One speaker tends to use *po* for the contrastive conjunction, but it is unclear whether it is a further reduced version of *pero* or originally Kaqchikel especially given that it is only present in the speech of one speaker that I have observed nor is it mentioned in the grammar (Rodríguez Guaján and García Matzar, 1997), the dictionary (Patal Majzul, 2007), or in Guarcax González (2016).

2.1.3.1 Nouns

Other than particles, adjectives, and adverbs, nouns make up one of the only word classes containing free unbound morphological roots. For instance, the verb root -*wa* ‘eat’ can never be used grammatically without either verbal inflection or deriva-

tional deverbal morphology as illustrated in (5a), so verbs form one of the classes of bound roots. Nouns, on the other hand, can be free roots and do not always require no additional morphology to be grammatical, as with *wuj* ‘book’ in (5c).

- (5) a. **yìn wa*
 1S eat
 Intended: ‘I eat’
- b. *x-in-wa*
 PRFV-B1S-eat
 ‘I ate.’
- c. *K’o jun wuj.*
 EXST one book
 ‘There is a book.’

While the example from (5c) exemplifies a noun as a free root, there are other nouns that do fall in the classification of bound roots. This class of nouns is smaller in number and primarily consists of relational terms and body parts. Nouns in this class are marked with a suffix unless they are marked with a possessive prefix. The suffixes for this class of nouns include *-aj/-ej*, *-laxel/-axel* and *-onel*, all of which are shown in (6). When the noun is possessed, the suffix is dropped, which is exemplified in (6) by the change from the non-possessed form on the left side of the arrow and the possessed form on the right side of the arrow.

- (6) a. *te’-ej* ‘mother’ → *nu-te* ‘my mother’
- b. *aqan-aj* ‘leg’ → *r-aqan* ‘his/her leg’
- c. *achijil-onel* ‘husband’ → *r-achijil* ‘his/her husband’
- d. *k’ajol-axel* ‘son (of male)’ → *ru-k’ajoj* ‘his son’

One final main amongst types of nouns is plural marking. Only a small subset of nouns are marked with the plural suffix *-a’/-i*, and most of the nouns refer to terms for people, such as *ak’wal* ‘child’, which becomes *ak’wala* to refer to more than one child. In addition to the human referents marked for plurality, there is a small number of animals that also take the plural suffix. Otherwise, plurality is not inflected for on the noun and is indicated by a numeral, or with the particle *taq*.

- (7) a. *ixöq* ‘woman’ → *ixöq-i* ‘women’
 b. *winaq* ‘person’ → *winaq-i* ‘people’
 c. *tz’ikin* ‘bird’ → *tz’ikin-a* ‘birds’
 d. *che* ‘tree’ → *taq che’/*che’-a* ‘trees’
 e. *che* ‘tree’ → *ka’i’ che* ‘two trees’

(from Brown et al., 2006, p.151)

Derived nouns can be formed by adding a derivational suffix to a verb root. Some of the more common derivational suffixes, which will appear throughout the dissertation, are listed in Table 2.3.

Morpheme and function	Verb form	Derived form and meaning
Verb + <i>-(V)b’äl</i> ‘instrumental/locative’	i. <i>-war</i> ‘to sleep’	i. <i>warab’äl</i> ‘bedroom’
	ii. <i>-jaq</i> ‘to lock’	ii. <i>jaqb’äl</i> ‘key’
Verb + <i>-ik</i> ‘nominalizer’	i. <i>-tijo</i> ‘to teach’	i. <i>tijonik</i> ‘class’
	ii. <i>-sipaj</i> ‘to give a gift’	ii. <i>sipanik</i> ‘gift’
Verb + <i>-el</i> ‘agentive’	i. <i>-tijo</i> ‘to teach’	i. <i>tijonel</i> ‘teacher’
	ii. <i>-b’ixan</i> ‘to sing’	ii. <i>b’ixanel</i> ‘singer’
<i>aj-</i> + Verb ‘agentive’	i. <i>-tz’ib</i> ‘to write’	i. <i>ajtz’ib</i> ‘writer’
	ii. <i>-k’ayij</i> ‘to sell’	ii. <i>ajk’ay</i> ‘vendor’

Table 2.3: Common nominal derivational morphemes

The suffixes include *-(V)b’äl* for instruments and locations, *-ik* as a nominalizer, and *-el* as an agentive. Though not as productive as the derivational suffixes, there is one derivational prefix, *aj-*, which is also agentive.

Finally, the last subtopic pertaining to the nominal domain is pronouns. Because person/number agreement is marked on verbs, independent pronouns are infrequently used. However, when reintroducing a referent into the discourse or when focused, independent pronouns are used. The pronoun used differs depending on the type of predicate: verbal or non-verbal. With non-verbal predicates, a shorter form is used than when the subject of a verbal predicate is a focused element. The forms are given in Table 2.4.

	Pronoun with NVPs	Pronouns in focus
1S	<i>yin</i>	<i>r(i)yin</i>
2S	<i>yit</i>	<i>riyit</i>
3S	\emptyset	<i>r(i)yä</i>
1P	<i>yöj</i>	<i>r(i)yöj</i>
2P	<i>yix</i>	<i>r(i)yix</i>
3P	<i>ye'</i>	<i>r(i)ye'</i>

Table 2.4: Overt pronouns with NVPs and with focus from (Guarcax González, 2016, p.31)

2.1.3.2 Verbs

Kaqchikel verbs house the most inflectional and derivational marking amongst the different word classes. Recall that verbs typically have the basic CVC root structure, such as *-wär* ‘to sleep’ or ‘*-tij* ‘to eat’. Kaqchikel also displays ergative/absolutive alignment, where subjects of intransitive verbs are marked the same as objects of transitive verbs as opposed to nominative/accusative languages like English, where subjects of both transitive and intransitive verbs are marked the same and objects are marked differently. An example using English pronouns, which are the only remnant of overt morphological differences for subject vs. object arguments, is given in (8). Examples (8a)-(8c) are all transitive verbs, and (8d)-(8e) are intransitive verbs. Contrasting the 1S subject in (8a) with the 1S object in (8b), the pronominal form is different. However, the 1S subjects of the transitive verb in (8a) and of the intransitive verb in (8d) are marked the same.

- (8) a. I saw him.
b. He saw me.
c. They saw them.
d. I walked.
e. They walked.

The ergative/absolutive system of Kaqchikel groups verbal arguments differently. In (9a)-(9c), the ergative subject, which is marked with a ‘Set A’ agreement mor-

pheme, differs from the absolutive argument, which is marked with a ‘Set B’ morpheme.

- (9) a. *X- \emptyset -in-tz’ët.*
PRFV-B3S-A1S-see
‘I saw him.’
- b. *X-i-ru-tz’ët.*
PRFV-B1S-A3S-see
‘He saw me.’
- c. *X-e-ki-tz’ët.*
PRFV-B3P-A3P-see
‘They saw them.’
- d. *X-i-b’iyin.*
PRFV-B1S-walk
‘I walked’
- e. *X-e-b’iyin.*
PRFV-B3P-walk
‘They walked.’

Comparing just the transitive construction of English and Kaqchikel, the alignment appears the same with a distinction between subject and object agreement markers. However, the intransitive subject argument in (9d) is marked the same as the object argument in (9b). The same is true for (9e) and the object agreement marker for (9c). Both the transitive object arguments and the intransitive subjects can be referred to as the absolutive arguments and the subjects of the transitive verbs are the ergative arguments.

Following the predominant Mayan linguistic tradition, I gloss the agreement markers as either Set A or Set B, which are used in order to acknowledge the other functions that the sets of markers are used for in Kaqchikel, such as use of the Set A markers for possessive arguments. The Set A markers are provided in Table 2.5 and the Set B markers are given in Table 2.6, where the first column labeled *_V* contains the allomorph used with the verb root begins with a vowel, and the column labeled *_C* contains the allomorph used when the verb root begins with a consonant. This

allomorphic variation between roots that begin with a vowel versus a consonant is a common pattern in Kaqchikel, which will be seen throughout this chapter for other morphemes.

	<i>_V</i>	<i>_C</i>
1s	<i>-inw-/w-</i>	<i>-in-</i>
2s	<i>-aw-</i>	<i>-a-</i>
3s	<i>-r-</i>	<i>-ru-/u-</i>
1p	<i>-q-</i>	<i>-qa-</i>
2p	<i>-iw-</i>	<i>-i-</i>
3p	<i>-k-</i>	<i>-ki-</i>

Table 2.5: Set A Markers

	<i>_V</i>	<i>_C</i>
1s	<i>-in-</i>	<i>-i-</i>
2s	<i>-at-</i>	<i>-a-</i>
3s	\emptyset	\emptyset
1p	<i>-oj-</i>	<i>-oj-</i>
2p	<i>-ix-</i>	<i>-ix-</i>
3p	<i>-e'-</i>	<i>-e-</i>

Table 2.6: Set B Markers

In addition to person/number agreement, all finite verbs in Kaqchikel are marked with one of four available (tense)²/aspect/mood markers ((T)AM), which are listed in Table 2.7. The final column in the table gives the forms used when the absolutive argument is 3S, which is zero-marked, but the (T)AM allomorph reflects that there is a 3S argument.

Both person/number agreement and (T)AM are inflectional prefixes. Any valence changing morphology, such as passives or antipassives, or other derivational morphemes are suffixes. The basic verbal template is given in (10).

(10) TAM-SETB-SETA-VERB-DERIVATION

²I leave tense in parentheses in this chapter, but I argue in Ch. 5 that there is no grammatical tense in Kaqchikel, so the markers available should only be referred to as aspect/mood markers.

	Basic morpheme	B3S Allomorph
Imperfective	<i>y-/nk-</i> (Sololá dialect)	<i>n-</i>
Perfective	<i>x-</i>	<i>x-</i>
Potential	<i>xk-</i>	<i>xt-</i>
Hortative/Imperative	<i>k-</i>	<i>t-</i>

Table 2.7: (Tense)/Aspect/Mood Markers

Kaqchikel also makes a distinction between root transitives, root intransitives, and derived transitives. One such contrast is seen with the transitive verb *-tij* ‘to eat’ as shown in (11c)-(11d), which is only grammatical with two arguments, whether they be agreement markers only indicated on the verb or independent noun phrases. The intransitive *-wa* ‘to eat’, on the other hand, adding an additional argument is ungrammatical, which is illustrated in (11a)-(11b).

- (11) a. **X-in-wa*’ *jun wäy*
PRFV-B1S-eat one tortilla
Intended: ‘I ate a tortilla.’
- b. *X-in-wa*’
PRFV-B1S-eat
‘I ate.’
- c. *X-e’-in-tij* *ka’i’ wäy.*
PRFV-B3S-A1S-eat two tortilla
‘I ate two tortillas.’
- d. **X-e’-in-tij.*
PRFV-B3S-A1S-eat
Intended: ‘I ate.’

To derive a transitive from a root intransitive verb the suffix *-Vj* can be added, which increases valency by one. In some cases, the meaning of the root intransitive may not be obvious, such as the example in (12a) with the verb *-q’etej* ‘to hug’, where one might expect that the act of hugging entails that there is a hugger and a huggée. The example in (12b) is somewhat clearer, where the verb *-wär* ‘to sleep’ is derived using the causative morpheme *-isa-* and the transitivizing suffix *-(V)j*, which combined means ‘to put to sleep’.

- (12) a. *X- ϕ -in-q'et-*ej.*
 PRFV-B3S-A1S-hug-TV
 'I hugged him/her.'*
- b. *X- ϕ -in-war-isa-*j.*
 PRFV-B3S-A1S-sleep-CAUS-TV
 'I put him/her to sleep.'*

Derived transitives can also be formed by adding the suffix *-Vb'a'* to a positional root (see § 2.1.3.3 for a more detailed discussion of positional roots, which are part of a distinct morphological class from verb roots). In (13) the positional root *-raq* 'lean' is derived as a transitive verb, which means 'to lean something against something else.'

- (13) *X- ϕ -in-raq-ab'a'*.
 PRFV-B3S-A1S-lean-POS.TV
 'I leaned against it.'

Other valence changing morphemes that are suffixes include passives, causative (as shown in (12b), antipassive and agent focus. First, the passive is formed by adding the suffix *-Vx*, which removes the agent argument. The first example, (14a), is the root transitive verb *-tz'ët* 'to see'. When the passive suffix is added in (14b) the 1S ergative (agent) argument is removed and only the absolutive 3P (patient) argument remains.

- (14) a. *X-e'-in-tz'ët.*
 PRFV-B3P-A1S-see
 'I saw them.'
- b. *X-e-tz'et-ëx.*
 PRFV-B3P-see-PAS
 'They were seen.'

The next example takes the derived transitives from (12b) and (13) and applies the passive suffix to result in the removal of the agent argument leaving only the patient argument. Note that the *-j* suffix for *-wär* is removed when passivized in (15a).

- (15) a. *X- \emptyset -war-isa-x.*
 PRFV-B3S-sleep-CAUSE-PAS
 ‘He/she was put to sleep.’
- b. *X- \emptyset -raq-ab’a-x.*
 PRFV-B3S-lean-POS.TV-PAS
 ‘It was leaned against (by something/someone).’

While the passive removes the agent argument, the antipassive suppresses the patient argument. The example in (16b) is the antipassive form of (16a), and (16d) is the antipassive form of (16c).

- (16) a. *N- \emptyset -u-yüch’* *r-uq.*
 IMPF-B3S-A3S-pleat A3S-skirt
 ‘She pleats her skirt.’
- b. *N- \emptyset -yuch’-un.*
 IMPF- \emptyset -pleat-AP
 ‘She pleats.’
- c. *Y-ix-q-il.*
 IMPF-B2P-A1P-find.
 ‘We find you.’
- d. *N-q-il-on.*
 IMPF-A3P-find-AP
 ‘We find.’

Finally, the agent focus construction, which has received much attention in Mayan linguistics (Aissen, 1992, 1999, 2011; Stiebels, 2006; Erlewine, 2016; Velleman, 2014), is a construction that might better be called agent extraction. Use of agent focus in Kaqchikel is licensed only by specific syntactic constructions including *wh*-questions, relative clauses, focus constructions and existential arguments (Erlewine, 2016). The agent focus construction is marked with the suffix *-o* on the verb and looks syntactically quite similar to an antipassive in that they are both morphologically intransitive. However, only the antipassive demotes an argument. This is evident when the patient argument is reintroduced, where the antipassive

patient argument is reintroduced as an oblique (i.e. indirect) argument of the verb, as shown in (17b). The example of agent focus in (17d) shows that both transitive arguments are syntactically present unlike in the antipassive.

- (17) a. *Y-i-tz'et-on.*
 IMPF-A1S-see-AP
 'I see.'
- b. *Y-i-tz'et-on aw-ichin.*
 IMPF-B1S-see-AP A2S-RN
 'I see with respect to you.' (Brown et al., 2006, p.180)
- c. *X-ø-i-tz'ët ma Juan.*
 PRFV-B3S-A1S-see CL Juan
 'I saw Juan.'
- d. *Ja yin x-i-tz'et-o ri ma Juan.*
 FOC 1S PRFV-A1S-see-AF D CL Juan
 'It was me who saw Juan.' (Erlewine, 2016, p.436)

One final morphological group related to verbs important to note are directionals and incorporated movement. Directionals are particles that indicate the direction of the action denoted by the verb root. Directionals syntactically appear post-verbally and are not attached to the verb, (i.e. not clitics or affixes). Table 2.8 provides a list of common directionals and their meaning.

Particle	Meaning
<i>pe</i>	toward
<i>apon</i>	away from
<i>qaj</i>	downward
<i>ok</i>	come in
<i>el</i>	go out
<i>kan</i>	stay in place
<i>aq'anäj</i>	upward

Table 2.8: Directionals (Rodríguez Guaján and García Matzar, 1997, p.227)

Incorporated movement differs from the use of directionals in that directionals indicate direction of movement and are not cliticized or affixed to anything.

Incorporated movement, on the other hand, is formed by prefixing a verb of movement, such as *-b'e* 'to go', after the Set B marker and before the Set A marker and the verb root, which is shown in (18).

- (18) *X-ø-b'e-ru-tz'et-a'*.
 PRFV-B3S-go-A3S-see-SS
 'He went to see it.'

2.1.3.3 Positionals

The morphological class of positional roots is a less familiar class, but it forms a very productive class of roots in Kaqchikel as well in other Mayan languages. While positional verbs are quite common, for instance, *standing*, *sitting*, and *lying down* in English, the morphological classification of positional roots is distinctive from verbal roots in Kaqchikel. The meaning of the roots in Kaqchikel can be quite specific, such as depicting the size and shape of the entity being described by the positional root. Positional roots describe location, form, and, of course, position (e.g. 'lying face down' vs. 'lying face up' in English). Positional roots have canonical CVC root structure, and, like verbs, the roots are bound morphemes and must take additional morphology to be grammatically well-formed.

- (19) a. **ri kot kumatz*
 D twisted snake
 Intended: 'the twisted snake'
- b. *ri kot-ok-äq kumatz*
 D twisted-RED-ADJ.POS.PL snake
 'the twisted snakes' (Tummons, 2010, p.43)

- (20) a. **E tz'uy*
 B3P seated
 Intended: 'They are seated.'
- b. *E tz'uy-ül.*
 B3P seated-POS.PRED
 'They're seated.'

Example (21) is evidence that the positional roots are not verb roots. In order to take (T)AM and person/number agreement, the positional root must first be derived as intransitive or transitive verbs. For instance, adding the derivational suffix *-Vb'a* to the positional root *-chup* ‘extinguish’ is required in order to use verbal inflectional prefixes, as in (21b).

- (21) a. **X-ϕ-in-chup* *ri q'aq'*
 PRFV-B3S-A1S-extinguish D fire
 Intended: ‘I turned off the light (lit. ‘I extinguished the fire.’)
- b. *X-ϕ-in-chup-ub'a* *ri q'aq'*.
 PRFV-B3S-A1S-extinguish-POS.PRED D fire
 ‘I turned off the light.’

Table 2.9 provides a list of the most common and productive derivational suffixes for positional roots along with an example for each one.

	Suffix	Root	Example
Intransitive	<i>-e'</i>	<i>-kaw</i> ‘lying face down’	<i>nikawe'</i> ‘S/he is lying face down.’
Transitive	<i>-Vb'a'</i>	<i>-tzeq</i> ‘hanging up’	<i>xintzeqeb'a'</i> ‘I hung it up.’
Predicative	<i>-Vl</i>	<i>-tz'uy</i> ‘sitting’	<i>in tz'uyül</i> ‘I am seated.’
Adjectival	<i>-ik</i> (sg.) / <i>-äq</i> (pl.)	<i>-set</i> ‘round’	<i>setesik wäy</i> ‘round tortilla’

Table 2.9: Positional roots derivations in Kaqchikel

For a detailed analysis and discussion of verb roots in Kaqchikel, see Tummons (2010), which details the full derivations for over 200 positional roots found in the language.

2.1.3.4 Prepositions and relational nouns

To wrap up the discussion of morphological classes relevant to the discussion in the dissertation, this section introduces two closely related word classes: prepositions and relational nouns. Regular prepositions are straightforward to understand, but they are few in number in Kaqchikel. In fact, only two regular prepositions, *pa(n)* and *chi* are listed in Rodríguez Guaján and García Matzar (1997). Examples (22a)-(22b) illustrate use of each preposition.

- (22) a. *E k'o pa jun nima tinamit.*
 B3P EXST PRE one big town
 'They are in a large city.'
- b. *X- ϕ -in-ya' jun wuj chi a Juan.*
 PRFV-B3P-A1S-give jun wuj PRE CLF Juan
 'I gave a book to Juan.'

In addition to the two prepositions, some relational nouns also function like prepositions, and in fact, combine with the regular prepositions to form more complex prepositions. Relational nouns are distinct from regular prepositions because they are obligatorily marked for agreement with their arguments using the Set A markers. The origin of some relational nouns is transparent, such as *-ij* 'back' for 'behind' and *-wi'* 'head/hair' for 'on top of', where the noun refers to a body part as a way of relating the location of an entity. Some of the more commonly used relational nouns that have the same syntactic function as primarily locative prepositions are listed in Table 2.10 along with the two regular prepositions in Kaqchikel.

Preposition	Relational noun	Function	Inflected example
<i>pa(n)</i>	—	in, at, around	—
<i>chi</i>	—	to	—
—	<i>-ik'in</i>	with	<i>awik'in</i> 'with you'
—	<i>-xk'in</i>	beside	<i>nuxk'in</i> 'beside me'
<i>chi</i>	<i>-ij</i>	behind	<i>chi rij</i> 'behind it'
<i>chi</i>	<i>-xe'</i>	below	<i>chi ruxe'</i> 'below it'
<i>chi</i>	<i>-kojöl</i>	among	<i>chi ikojöl</i> 'among us'
<i>pa</i>	<i>-wi'</i>	above, on top of	<i>pa ruwi'</i> 'on top of it'
<i>pa</i>	<i>tz'an</i>	at the tip	<i>pa rutz'an</i> 'at the tip of it'

Table 2.10: Prepositions and (locative) relational nouns

For the complex prepositions formed with *chi*, quite commonly the *ch-* is cliticized to the relational noun dropping the vowel (e.g. *chi rij* becomes *ch=rij* and *pa ruwi'* becomes *pa=rwi'*).

In addition to the locative uses listed thus far, some relational nouns, such as *-oma* 'because', *-ik'in* 'with', and *-ichin*, which is similar to a genitive case, are

considered grammatical relational nouns. The grammatical relational nouns are can be used syntactically to introduce (or conjoin) clauses as well as introduce oblique arguments. The example in (23a) illustrates *-oma* used to syntactically introduce a subordinate clause while (23b) shows the genitive-like oblique phrase introduced by *-ichin*.

- (23) a. *N- ϕ -kikot r-oma k'o jun ch'ich'.*
 IMFV-B3S-be.happy A3S-RN EXST one car
 'He is happy because he has a car.'
- b. *La wuj la' w-ichin rin.*
 D book D A1S-RN 1S
 'That book is mine.'

2.1.4 Syntax and morphosyntax

2.1.4.1 Basic word order and movement

Kaqchikel is a verb initial language (VOS) with two preverbal positions, topic and focus, where constituents can be moved. The first position is reserved for topics, which is followed by focused constituents. The example in (24a) has basic VOS order. Examples (24b) and (24c) illustrate topic and focus for intransitive subjects respectively.

- (24) a. *X- ϕ -wär ri qa-mama'.*
 PRFV-B3S-sleep D A1P-grandfather
 'Our grandfather slept.'
- b. *Ri qa-mama' x- ϕ -wär.*
 D A1P-grandfather PRFV-B3S-sleep
 'Our grandfather slept.'
- c. *Ja ri qa-mama' x- ϕ -wär.*
 FOC D A1P-grandfather PRFV-B3S-sleep
 'It was our grandfather who slept.'

Note that there is no special morphology indicating that a constituent is topicalized, but the focused construction is introduced by the focus marker *ja*. While *ja* is the

standard form for the focus in many dialects of Kaqchikel, Sololá Kaqchikel marks focus with *yí*, which is illustrated in example (25).

- (25) *yí a-papá n-ø-b'an sekwestrar*
 FOC A2S-father IMPF-B3S-do kidnap.SP
 'It's your father who we are going to kidnap.'

(Guarcax González, 2016, p.58)

2.1.4.2 Predication

Kaqchikel predicates are quite flexible in that verbs, adjectives and nouns can serve as the head of a predicate, which is similar to other Mayan languages, such as K'ichee' (Velleman, 2014).

Verbal predicates are categorized as such because the predicate is a finite verb marked for person/number agreement (see Table 2.5 and Table 2.6) and (T)AM (see Table 2.7). Verbal predicates also minimally have a subject, where subjects can either be expressed as independent nouns or pronouns cross-referenced on the verb, as in (26a), or only with the agreement markers on the verb as in (26b).

- (26) a. *X-ø-ru-tij kinaq a Juan.*
 PRFV-B3S-eat beans CLF Juan
 'Juan ate beans.'
- b. *X-in-oq'.*
 PRFV-B1S-cry
 'I cried.'

Verbal predication is fairly straightforward. The more complex aspect of the verbal domain was discussed in § 2.1.3.2 with the various possible derivational and inflectional morphology in the verbal domain. Up to this point, however, discussion of the perfect construction has been left out. The perfect in Kaqchikel is less straightforwardly a verbal predicate. The root of the construction is a verb root marked with the perfect suffix as shown in (27).

- (27) a. *in atin-inäq*
 B1S bathe-PERF.IT
 ‘I have bathed.’
- b. *at-ru-tz’et-om*
 B2S-A3S-see-PERF.TV
 ‘You have been seen.’

(Rodríguez Guaján and García Matzar, 1997, p.85)

The most notable difference between the perfect and the other four (T)AM markers is that the perfect is a suffix while the others are prefixes. A further point of interest arises between the differences in the placement of the agreement markers for transitive and intransitive verb roots. Returning to the examples in (27), example (27a) has an intransitive verb *-atin* ‘bathe’, and the absolutive argument agreement marker is not attached to the verb as with the other (T)AM mood markers seen thus far. The transitive example in (27b), on the other hand, does have both the ergative and absolutive arguments marked on the verb. This difference in morphological marking makes the perfect a bit of a puzzle from the perspective of classification as verbal or non-verbal predication by using morphological or syntactic criteria alone to make the determination. For the purposes of this dissertation, I will refer to the perfect as a verbal predicate in spite of the fuzziness with the differences for intransitive perfects patterning more like non-verbal predicates and transitives patterning more like verbal predicates. I return to this issue in a bit more detail in Ch. 6 to show that there are instances where the perfect patterns semantically with non-verbal (stative) predicates even if not morphologically.

Turning now to non-verbal predication, two common types of non-verbal predicates (NVPs) are formed as zero-copula constructions or using the existential *k’o*. Existential predicates are formed using the copula *k’o*, which developed from the positional root *k’oj* ‘exist’. While *k’oj* still has a function as a regular positional root (i.e. still takes the regular derivational morphology), the form *k’o* is a reduced form that functions more like an existential copula and is not a bound root. The copula *k’o* is used for locative predicates, as in (28a), for existential predicates as in (28b), and for possessive predicates as in (28c). The example in (28d) shows the po-

sitional root *k'oj* derived as an intransitive verb and marked with perfective aspect, which illustrates use of the regular positional root as well as how past reference times can be established with existential predicates.

- (28) a. *Jeremias k'o wawe'*
 Jeremias EXST here
 'Jeremias is here.'
- b. *k'o jun tz'ikin parwi' che'*
 EXST one bird PRE tree
 'There is a bird in the tree.'
- c. *ri ak'al k'o jun ru-siyan*
 DET child EXST one B3S-cat
 'The child has a cat.'
- d. *Jeremias x-k'oj-e' pa Sololá iwir*
 Jeremias PRFV-exist-ITR PRE Sololá yesterday
 'Jeremias was in Sololá yesterday.'

Although (28b) is translated with expletive 'there is' in English, the example in (29) with the same word order as (28a) is equivalent in meaning to (28b).

- (29) *jun tz'ikin k'o pa-r-wi' che'*
 one bird EXST PRE-A3S-RN tree
 'A bird is in the tree.'

While the existential predicates make use of the *k'o*, many non-verbal predicates are formed as zero-copula constructions, including those formed with derived positional roots, which were previously discussed in § 2.1.3.3. The zero-copula constructions discussed in this section are formed with positionals derived with the attributive suffix and thus their syntax can be described with other attributive predicates below.

Attributive predicates are zero-copula constructions that can be formed using a noun or pronoun with an adjective, and they can also be formed with a noun (or pronoun) followed by a second noun. Examples (30a)-(30d) illustrate possible attributive predicates.

- (30) a. *ri jay nīm*
 DET house big
 ‘The house is big.’
- b. *tzaq nu-tziyaq*
 white A1S-shirt
 My shirt is white.
- c. *riya jun tijonel*
 3S one teacher
 ‘S/he is a teacher.’
- d. *in tz’uy-üil*
 B1S sit-DRV
 ‘I’m seated.’

Both types of non-verbal predication discussed in this section appear in the diagnostics for projection but also play an important function in understanding the semantic differences between temporal and aspectual particles that will be the focus of discussion in Ch. 6.

2.2 A note on data collection

2.2.1 Speaker information

All of the data presented in this dissertation unless otherwise indicated is the result of primary fieldwork with native speaker consultants of the Sololá dialect of Kaqchikel. Over the span of four years, I worked with a total of 9 consultants, both male and female, who ranged in age from 18-40. Of the consultants, I had two primary consultants, who both spoke English, Spanish, and Kaqchikel fluently. Most often, I worked with these two speakers in English. I also worked frequently with a third speaker, who was fluent in both Spanish and Kaqchikel, over multiple field trips, and I worked with her in Spanish. The other consultants mentioned in the total count of 9 were only worked with during a singular field trip. The result of that trip was a set of personal narratives recorded and transcribed that served as a partial

basis for example sentences out of which the diagnostics in this dissertation were constructed. With one exception, all consultants self-reported that Kaqchikel was their dominant language and the language used at home. All are bilingual Spanish and Kaqchikel speakers. The one exception was one of the youngest speakers, who spoke a particularly mixed version of Spanish and Kaqchikel. He also reported that he only spoke Kaqchikel with his grandparents but spoke Spanish elsewhere. With that in mind, his results were not considered in the analysis presented here.

2.2.2 Methodology

In recent years, there has been an increase in interest from theoretical linguists in understanding the semantics and pragmatics of understudied languages of the world. Out of this trend has sprung an increasingly more fine-tuned set of standards for eliciting judgments targeting various semantic and pragmatic phenomena previously only studied in larger languages, like English. The elicitation methods used to collect the data presented here are based on such methods for semantic fieldwork as those described in Matthewson (2006b, 2013); Tonhauser and Matthewson (2016) and Bochnak and Matthewson (2015).

While the results given in this dissertation mostly represent responses to tasks developed to target specific semantic and pragmatic phenomena in the language related to temporality and projection, the goals of the field work in its early stages focused on figuring out features of the grammar of the Sololá dialect of Kaqchikel. The work here relies heavily on the foundational work in the comprehensive reference grammar from Rodríguez Guaján and García Matzar (1997) as well as other investigations of aspects of Kaqchikel grammar (Tummons, 2010; Stoll, 1958; Maxwell and Hill, 2006; Maxwell, 2011; Hendrick-Krueger, 1986; Henderson, 2012; Guarcax González, 2016; *inter alia*) that served as the starting point for investigations of relevant constructions and features of the language of interest with respect to the current project. I began my field work by focusing on collecting acceptability judgments from consultants in addition to recording their personal narratives (e.g. I would ask them to tell me a story from their childhood). In order to facilitate the description of the specifics in methodology that I used in the

field, defining and understanding the types of tasks and judgments for those tasks is crucial to the interpretation of the results provided here as well as understanding the goals of the tasks described.

Throughout the dissertation, I frequently refer to acceptability judgments tasks, which are very common in linguistic inquiries more broadly. In an acceptability judgment task, speakers are presented with a sentence (in most instances, I provide speakers with a sentence situated in a context) and asked if the sentence is acceptable. The assumption is a judgment of ‘acceptable’ means that the sentence is grammatical (i.e. syntactically well-formed), felicitous, and has truth-conditions (Tonhauser and Matthewson, 2016, 16). For example, I would often begin investigating a given construction by first taking examples from the grammar by Rodríguez Guaján and García Matzar (1997) or from Brown et al. (2006) and ask one of two things: (i) Is this something you would personally say? (ii) Does this sentence sound good/bad/okay to you? The following example sentence is from Guarcax González (2016), which also focuses on the Sololá dialect. Consultants were asked to judge whether or not the construction in (31) sounded ‘good’ or ‘bad’ to them.

- (31) *x-ø-jote’ wkami*
 PRFV-B3S-climb today/now
 ‘I climbed today.’”

(Guarcax González, 2016, p.32)

For this particular example, all of the speakers that I asked judged it to be ‘good’. Because the speakers found it to be acceptable, it provides evidence that (31) is syntactically well-formed, felicitous, and has truth-conditions.

On the other hand, the example in (32b) of the focus construction uses the particle *ja* in first position in the sentence to introduce the extracted element in focus position. The base sentence (i.e. prior to movement of the focused element) is given in (32a).

- (32) a. *x-ø-wär ri tetata’.*
 PRFV-B3S-sleep D old.man
 ‘The old man slept.’

- b. *Ja ri tetata' x-ø-wär*
 FOC D old.man PRFV-B3S-sleep
 'It was the old man who slept.'

(Rodríguez Guaján and García Matzar, 1997, p.391)

In regards to (32b), I asked speakers if they would personally say this. They all expressed that although they understand it they personally would not say it, and several noted that it sounds like something a person from Comalapa would say. In contrast to the acceptable judgment for (31), the fact that speakers did not judge (32b) to be acceptable is inconclusive as to which factor leads to the unacceptability of the sentence (Chomsky, 1977; Matthewson, 2004; Tonhauser and Matthewson, 2016), so more work must be done to determine the cause.

One way of determining the cause of unacceptability is to make minimal changes to the construction (or the context in which it is used) that the researcher hypothesizes to be the issue. Using the minimal changes as contrastive minimal pairs, where the minimal change results in an unacceptable judgment to become acceptable, the researcher now has evidence that the hypothesized issue was actually the issue. For instance, recall that the speakers of the Sololá dialect use the particle *yï* to introduce focused elements rather than *ja* as presented in (32b). Once speakers judged (32b) to be unacceptable and after noting the form described in Guarcax González (2016), I minimally changed the example in (32b) from *ja* to *yï*.³

- (33) *Yï ri tetata' x-ø-wär*
 FOC D old.man PRFV-B3S-sleep
 'It was the old man who slept.'

By making this minimal change, speakers then judged (33) to be acceptable. By evaluating the judgments of the two constructions together as a contrastive minimal pair, I was able to conclude that the focus construction using *yï* was now syntactically well-formed, felicitous, and has truth-conditions. This minimally allows use of the sentence in (33) as a part of other diagnostics that focus on contexts rather than the acceptability of sentences in isolation.

³It should be noted that the particle *ja* is still used in Kaqchikel in other functions, such as with the affirmative particle 'yes'.

Because the data presented here concerns both the semantic and pragmatic domain, I use context-induced elicitations once I have determined acceptability of a sentence in isolation. Context-induced elicitation involves taking the well-formed examples from the earlier elicitation and situating them in various contexts that are designed to target different phenomena. Speakers are again asked to make acceptability judgments (unacceptability of a given sentence in a context is noted as # following standard notation). In these cases, the focus is on context and how it affects the acceptability of the utterance. For instance, the example in (31) was considered acceptable to all of the consultants. Because one area of interest in the current project is temporality in Kaqchikel, I situated the example in a context that limited the reference time to a future reference time. Though Ch. 5 discusses the results of such diagnostics in more detail, the goal of the diagnostic is to determine if there are restrictions on use of the perfective aspect to non-past reference times with the hypothesis being that if the perfective is not encoding a reference time, it should be acceptable in non-past times.

(34) [Context: What do think you will accomplish this afternoon?]

#x- ϕ -jote' wkami
 PRFV-B3S-climb today/now

Intended: 'I will have climbed today.'

Interestingly, all of the speakers judged the sentence in a non-past reference time to be unacceptable, which means that the specific context in which the sentence is used affects the acceptability of the sentence.

In addition to acceptability judgments, implication judgments were also used. The implication judgment tasks used were indirect judgment tasks, where the questions asked to the speakers provided clues about the implication of interest (Tonhauser and Matthewson, 2016, for a more detailed discussion of types of implication judgments see). For example, speakers were provided with the context and sentence pair in (35).

(35) [Context: You are trying to create a list of people to invite to Roberto's birthday dinner. Obviously, you only want to invite people that Roberto's likes and wants to there. You ask him if you should invite his boss, who he normally says fond things about. He says:]

Ri ki-te' tz'e' ma x-ø-toj tä nu-q'ij.
 D B3P-mother dog NEG PRFV-B3S-pay IRR A1S-day

'That bitch (lit. mother of dogs) didn't pay me my wage!'

After hearing the example in (35), the consultants were then asked if they would invite Roberto's boss to the party. The target of the question is the implication that Roberto's boss is currently out of favor with Roberto. Responses that 'no' the boss should not be invited suggest that this implication does arise in (35) but responses of 'yes' would mean that the implication does not arise. Consultants all responded that they would not invite the boss based on this example, which provides a clue that the implication of interest is triggered in (35).

For the remainder of the dissertation, I refer to the two types of judgments discussed here: acceptability judgments and indirect implication judgments. Keeping in mind that acceptability judgments encompass more than just syntactic well-formedness or just felicity, the examples used beyond this chapter and Ch. 3 all reflect acceptability of a given utterance that has already been determined to be syntactically well-formed and felicitous in isolation of the contexts before being situated in a context or before being used as an example sentence as part of other diagnostics. With that in mind, judgments of unacceptability are assumed (or hypothesized) to be due to the parameters established in the context.

2.3 Background to studies on projection

When a speaker utters a sentence with the intention of communicating, it is generally thought that the overall meaning conveyed is comprised of two levels of meaning: the asserted content and the backgrounded content. The asserted content is the main point of the utterance while the backgrounded content is not. Because semantics is generally concerned with the truth-conditions of natural language, studies of

presupposition and related conventionalized meaning within semantics are thus interested in analyzing phenomena with respect to their truth-conditional properties. That is to say, semanticists want to understand how the presuppositions affect the truth-conditions of the overall sentence. Take, for instance, the infamous *King of France* example in (36). The utterance in (36a) is said to presuppose the content of (36b).

- (36) a. The King of France is bald.
b. \rightarrow There is a King of France.

Under a Russellian view of definite descriptions, the lack of existence in the real world of a King of France results in a falsity of (36a), which is contra Frege who proposed that a sentence like (36) simply would receive a truth-value. For Frege (1892) and later Strawson (1950), the existence implication is a precondition of the utterance that must be met in order to be evaluated as true or false. If this precondition, or presupposed content, is not met then the utterance cannot be true or false but is undefined and the utterance has no meaning. If the precondition is met, the utterance can receive a truth-value, either true or false, but regardless of the truth or falsity of the utterance, the content of the precondition is true. Borne out of this is the use of negation as a test to determine if content is presuppositional or not.

In both philosophy of language and linguistics, there is a rich history of studies on the projective meaning triggered by classical presuppositions, which began with the intuitions of Frege (1892) already mentioned. Only in more recent traditions has there been a shift in consideration to other types of meaning that trigger projective implications, namely conventional implicatures (Potts, 2005). One of the central debates about projective content is the source of the content: semantic or pragmatic. A simplified perspective of the semantic vs. pragmatic debate is that semantic sources mean the content is conventionalized and always triggered while pragmatic inferences are based on speakers and context more than conventionally encoded meaning in the grammar. Most of the literature in the late 20th and the 21st century concerns itself primarily with English projective content, and to an extent,

the debate is largely unsettled. There are, however, an ever-increasing number of studies using empirical methodologies targeting projection and related phenomena. Empirical studies fall within two larger categories: experimental research methods and field research methods. Experimental studies focus on testing theoretical assumptions primarily only on well-studied languages like English, French, and German. Field methodologies, however, bring novel data from a diverse range of mostly under-studied languages of the world to bear on theoretical claims. This dissertation is based on a field study of Kaqchikel using empirical methodologies with a specific interest in uncovering linguistic expressions that trigger projective implications in the language.

In the following sections, I provide an overview of approaches to presuppositions and other implication types. The body of literature on presupposition alone is far too vast to summarize in a mere section of a dissertation, so I discuss only briefly the heavy hitters in the literature, and I point to more recent developments for frameworks that bear on the outcomes of this project.

2.3.1 Presuppositions and projection

The Frege-Strawson tradition highlights the feature of presuppositions that when under the scope of negation, a presupposition is not negated and remains true. In fact, the characteristic feature of a presupposition is escaping negation and other operators that affect the entailments and overall truth-conditions of an utterance. This property, referred to as projection, applies to presuppositions embedded in the antecedent of conditionals, in questions and, of course, negation (for a simple account of presupposition projection see Langendoen and Savin, 1971). Though much of the early debate on presupposition focused on definite descriptions, numerous other expressions are considered presuppositional. In (37), I give examples for some of the expressions in English that are noted as triggering presuppositions, though the list is not exhaustive of the possible expressions to consider.

(37) *Presupposition triggers in English*

a. DEFINITE DESCRIPTION

The winner of the Nobel Peace Prize is a man.

→ There is a unique winner of the Nobel Peace Prize.

b. FACTIVE VERB

I know that the winner of the Nobel Peace Prize is from Colombia.

→ The winner of the Nobel Peace Prize is from Colombia.

c. ASPECTUAL VERBS

Mary stopped smoking.

→ Mary used to smoke.

d. ANAPHORIC EXPRESSION

I stopped smoking, too.

→ Someone else stopped smoking in addition to me (or I stopped smoking in addition to stopping something else).

e. IT-CLEFT

It was my sister who sent me a gift.

→ Someone sent me a gift.

f. INTONATIONAL FOCUS

MARY stopped smoking (where 'Mary' receives stress).

→ Mary, and not someone else, stopped smoking.

The defining characteristics of the larger classification of presuppositions of the sort listed in (37) are the survival of the implication when embedded under certain operators, and further the content is always backgrounded information taken for granted by speakers (i.e. presuppositions are not responsible for introducing new information).

2.3.2 Semantic vs. pragmatic presuppositions

The early theories of presuppositional content were semantic in nature and focused on the conventionalized properties of presupposition triggers. Stalnaker (1973) in-

troduced the idea of 'speaker presuppositions' and the common ground shared between speakers. Speaker presuppositions are not about what sentences and words presuppose (i.e. 'semantic' presuppositions). Rather, they are about what a speaker presupposes (i.e. pragmatic presuppositions), so the importance of presuppositions concerns speaker intentions rather than meaning conventionally encoded. While a Stalnakerian view of presupposition concerns pragmatics, namely how the context affects meaning as do speaker intentions, his work was not intended to make claims that presuppositions are purely pragmatic. Under this view, interlocutors have shared common ground. Speakers then make assumptions about what information comprises this common ground. Thus, when a speaker makes a choice to make an assertion that relies on backgrounded content, the speaker is taking for granted that the information is a part of the common ground. If the speaker is mistaken and the content is actually not a part of the common ground, then the hearer can update the common ground by interpreting the speaker's intention.

The next decade saw another shift in the focus of studies of presupposition towards dynamic approaches. One approach introduced in Heim (1982, 1983) exploits the common ground approach from Stalnaker, where only the context update is built into the semantics for Heim in terms of its context change potential, or a sentence's potential to change the context in which it is uttered. Presuppositions, then, introduce requirements on the context as partial update functions, where the context must have certain properties to be updated. Another approach that emerged around the same time is a different dynamic approach in Kamp (1981), which also focused on capturing the anaphoric properties of presuppositions. Both approaches led to further developments within semantic framework aimed at capturing the contribution of presuppositions to the truth-conditions of utterances (van der Sandt, 1989, 1992; Beaver, 1997, 2001; Zeevat, 1992). For a much more comprehensive overview of approaches to presupposition over the past century, see Beaver and Geurts (2014).

2.3.3 Implicatures

I turn now to another aspect of meaning: implicatures. Two types of implicatures are largely discussed in the literature: conversational and conventional. Both types of implicatures play an important role in the overall interpretation of the meaning of an utterance. While conventional implicatures are more relevant to the discussion in the current project, making the distinction between conversational and conventional implicatures is warranted. First, conversational implicatures are based on Paul H. Grice's seminal paper, *Logic and conversation* (Grice, 1970). In the paper, Grice proposed a set of maxims that conversational participants follow in order to effectively communicate. If conversational participants are cooperative speakers, i.e. they follow the Cooperative Principle, communication will be successful. The Cooperative Principle is based on four maxims: the Maxim of Quantity (do not contribute more than is required), the Maxim of Quality (do not lie), the Maxim of Relevance (make the contribution relevant) and the Maxim of Manner (be perspicuous). If a speaker violates one of the maxims, it gives rise to an implicature (conversational). The implicatures are crucially different from the implications triggered by presuppositional triggers in that there is no connection to specific linguistic expressions. Rather, as speech act participants, we 'read between the lines' when a maxim is violated or flouted, but the implicatures are easily cancelable or can be denied. Consider the example in (38).

- (38) A: How was the presentation this morning?
B: The pastries and coffee were great.

The response by speaker B appears to be violating the Maxim of Relevance by commenting on the food and not the presentation. However, speaker A can reasonably recognize the intentional flouting of the maxim to imply that the presentation was bad. Speaker B, however, can also deny the implicature was the intention. Imagine that the presenter, speaker C, is standing behind speaker B.

- (39) C: Was it really bad?
B: I didn't say it was bad, I just thought the pastries were especially great!

This aspect of conversational implicatures makes them distinct from the presuppositional implications. In Chapter 4, I return to this feature as a point of discussing the property of presuppositions and other projective meaning as part of the utterance that generally cannot be directly denied.

In addition to conversational implicatures, Grice also notes different type of implicature, which he refers to as conventional implicatures. After Grice (1970) introduced conventional implicatures in *Logic and conversation*, CIs were lumped in with presuppositions under many views because both are conventionally encoded. However, in the most notable treatment of CIs since Grice, Potts (2005) formalized the distinction between CIs and presuppositions. He refers to the Gricean definition of conventional implicatures as a starting point:

(40) *Definition of Conventional Implicatures* ((Potts, 2005, p.2) extracted from Grice (1970))

- a CIs are part of the conventional (lexical) meaning of words.
- b CIs are commitments, and thus give rise to entailments.
- c These commitments are made by the speaker of the utterance “by virtue of the meaning of” the words he chooses.
- d CIs are logically and compositionally independent of what is “said (in the favored sense)”, i.e., the at-issue entailments.

Looking at this definition of conventional implicatures, the distinction between CIs and classical presuppositions is still unclear. In both cases, the implications that arise are due to the conventions of the linguistic expression itself. A notable difference emerges when you look at an appositive construction in English.

(41) Alexa, a linguist, ran in the marathon.

Just like with the presupposition, the nominal appositive a linguist is not the main point of the utterance (i.e. not at-issue). And, just like a presupposition, it projects when embedded in the antecedent of a conditional.

(42) If Alexa, a linguist, ran in the marathon, then I am sure she finished the race.

The nominal appositive is not targeted by the conditional (i.e. in either case, Alexa is still a linguist), but the type of information conveyed by the appositive is different than that of a presupposition. It has been observed that while presuppositional content is considered backgrounded information or part of the common ground, conventional implicatures, like the appositive above, introduce new information into the discourse. Consider the case of expressives, where no prior knowledge of the speaker's attitudes are required to interpret the utterance. In (43), Steve does not need to know (and in fact has no prior knowledge of) anything relating to Siri's attitudes towards Alexa to interpret that Siri has a negative attitude about Alexa. It is the expressive *that jerk* that implies the negative attitude.

(43) [Context: Siri is having coffee with her friend Steve to discuss her first week at new job. Steve has been out of town since Siri started the job, so he has no knowledge of how things have been going. Siri says:]

That jerk Alexa keeps making me look bad at work.

The expressions of interest triggering CIs include both expressives and nominal appositives like those illustrated above. Potts (2005) also discusses honorifics, such as those in Korean and Thai, which encode information about the referent, such as age and gender in relation to the speaker. Each construction is responsible for introducing new information into the context, which is the most distinct difference between presuppositions and CIs.

Similar to nominal appositives, the content of non-restrictive relative clauses (NRRC) are also observed as introducing new information into the context, and the content survives when embedded (Chierchia and McConnell-Ginet, 1990). The example in (44a) contains an NRRC that is then embedded under negation in (44b). The truth of the content of the NRRC is unaffected, which suggests that the content in NRRCs is also projective.

- (44) a. Jamie, who is a friend of Max's, has an extra ticket to see The Mountain Goats.
b. It's not the case that Jamie, who is a friend of Max's, has an extra ticket to see The Mountain Goats.

2.3.4 A question-based approach to projective content

With developments in the study of CIs showing they also project out of the scope of the same operators as presuppositions do, recent studies consider the commonality of both types of meaning. Of the many approaches to presuppositions, most have their short-comings and fail to account for the variation across presuppositional triggers. Further, they overlook CIs and treat only presuppositions. Newer developments for approaches to projective content view both the content of presuppositions and of conventional implicatures to be part of the same larger category of meaning related by two properties: not-at-issueness and projection, where being not-at-issue means being not the main point of the utterance (Simons et al., 2010; Abrusán, 2011). The main point of an utterance is determined by pragmatic principles and speaker intentions, which are captured by the notion of the *question under discussion* (QUD)(Roberts, 1996, 2012). The QUD can either be an explicit or implicit question, which is determined by the speaker and by the discourse context. QUDs are organized hierarchically in a QUD stack with the main question is at the top of the stack. A proposition is at-issue if it addresses the question at the top of the stack. The observation is that the content of presuppositions and conventional implicatures are typically not available as answers to the QUD, which makes them not-at-issue. As we already saw, entailment cancelling operators, such as embedding under negation and in the antecedent of a conditional, only target at-issue content.

This approach has, at least, the following two benefits: i. it offers a way of accounting for both CIs and presuppositions in the same way; ii. it allows for flexibility that can account for instances where projective content can be at-issue and thus not projective. The observation that some linguistic triggers are more easily coerced into being at-issue or being cancellable or suspended, which is sometimes referred to as ‘soft’ vs. ‘hard’ presuppositions, is suggestive that pragmatics plays a role in determining if content is projective or not. The claim is that when presuppositions and CIs, which are expected to be not-at-issue with respect to the QUD, are at-issue, they no longer have the potential to project (Simons et al., 2010, p. 314).

This question-based approach to presuppositions and CIs is the central idea behind the present study. In the following two chapters, I appeal to the concepts laid out in Tonhauser et al. (2013); Simons et al. (2010) and Tonhauser (2012) as model for approaching projective meaning in Kaqchikel.

Chapter 3

Projective Content

In this chapter, I discuss one of the distinguishing properties between entailments and presuppositions: projection. While projection has long been studied for classical presuppositions, the inferences that arise from conventional implicatures (in the sense of Potts, 2005) and non-restrictive relative clauses (henceforth referred to as CIs and NRRCs) are also projective and are thus included in the discussion of the present chapter. Projection refers to implications that are unaffected when embedded under operators that target entailments but not presuppositions, CIs and NRRCs. In other words, the implications project out of the scope of the operators, while the entailments do not and no longer hold. The focus of this chapter is illustrating how to set up the diagnostics using Tonhauser et al. 2013 as a template for the project. The ultimate goal is to test for projection of implications for linguistic expressions in Kaqchikel, which will be the focus of Chapter 4. In addition to testing for projection, I also describe the diagnostics that target two additional properties that only apply to some types of projective meaning, which are referred to as *strong contextual felicity* and *obligatory local effect* in Tonhauser et al. 2013. Again, I use English as a model for how the tests should be set up and what exactly the tests are intended to target, but I return to the diagnostics and results for Kaqchikel in Chapter 4.

3.1 Identifying content that projects

Recall from the previous chapter that regular entailments can be distinguished from presuppositions by negating the proposition containing the implication. I take the term *implication* here to be neutral between entailments, presuppositions and im-

plicatures. If when negated the implication remains, the inference is commonly a presupposition (or as discussed below, a conventional implicature), and not an entailment or a conversational implicature. The differing behavior of presuppositions and regular entailments can also be tested by embedding under additional operators that are observed to only target entailments and the asserted content. The set of embedding constructions often referred to as the Family-of-Sentences is the standard diagnostic for projection (Chierchia and McConnell-Ginet, 1990). To implement the test, the sentence containing the linguistic expression triggering a given implication is embedded under negation, realized as a question, in the antecedent of a conditional or embedded under a possibility modal (e.g. *It's possible that...*), all of which effect the truth-conditions of entailments. Before embedding the propositions, identifying the possible inferences in the sentence is useful. Take the example in (45). From the base sentence, we can minimally infer the propositions stated in (45a) and (45b). The content of (45a) is an entailment of (45) because for the original proposition to be true, (45a) must also be true. The proposition in (45b) is an existence presupposition triggered in the definite description *The King in the North*, where it is assumed that such a king exists.

- (45) The King in the North was murdered at his wedding.
- a. The King in the North is dead.
 - b. There existed a King in the North.

With the Family-of-Sentences tests applied to (45), the existence implication in (45b) is unaffected and holds for (46a)-(46c). However, the proposition in (45a) can no longer be inferred for (46a)-(46c) when embedded under negation, in the antecedent of a conditional, and realized as a question, which is illustrated respectively in (46).

- (46) a. It is not the case that the King in the North was murdered at his wedding.
- b. If the King in the North was murdered at his wedding, there will be a war.

- c. Was the King in the North murdered at his wedding?
⇒ There existed a King in the North.

A slightly more complex sentence containing a projective trigger to embed and test for projection is given in (47). The utterance in (47a) contains an *it*-cleft, which triggers an existential implication that someone stole a cookie. In (47b), embedding the utterance under negation affects the entailment that Cookie Monster is the cookie thief, but the existential implication that someone is a cookie thief still holds. Examples (47c) and (47d) we see this is also the case when the sentence appears in the antecedent of a conditional and realized as a question.

- (47) a. It was Cookie Monster who stole the cookie from the cookie jar.
- b. It wasn't Cookie Monster who stole the cookie from the cookie jar.
- c. If it was Cookie Monster who stole the cookie from the cookie jar, then he will have crumbs in his fur.
- d. Was it Cookie Monster who stole the cookie from the cookie jar?
 ⇒ Someone stole a cookie from the cookie jar.

Though many implementations of the Family-of-Sentences embeddings involve the three embedding environments already shown, projective implications also project out of the scope of possibility modals, such as *maybe* or *perhaps*, which are illustrated respectively in (48a) and (48b).

- (48) a. Maybe it was Cookie Monster who stole the cookie from the cookie jar.
- b. Perhaps it was Cookie monster who stole the cookie from the cookie jar.

Just as with (47), the existence implication is unaffected, while the identity of the cookie thief is no longer part of the asserted content.

Beyond the implications triggered by presuppositions, conventional implicatures also trigger implications that project. Potts' style conventional implicatures (CIs) discussed here include expressives and appositives to the exclusion of honorifics since neither English or Kaqchikel have an honorific system that exists in languages like Korean (Potts, 2005). An expressive is a word or phrase (e.g. an

epithet) that triggers an implication that the speaker of the expressive has either a positive or negative attitude toward the referent. Further, the attitude can be previously unknown to the interlocutor, so expressives can be used to introduce new information into the discourse context. The potential to introduce new information into the discourse is one of the more notable differences between CIs and classical presuppositions. The example in (49) includes an example of the expressive phrase *son of a bitch*, which gives rise to the implication that the speaker has a negative attitude towards the referent.

(49) That son of a bitch didn't pay me the money he owes me.

In addition to CIs, the truth of the content of an NRRC is an implication that is also projective. In (50), the implication introduced by the NRRC, *who is a dancer* presupposes the truth of the proposition that Mary is a dancer.

(50) Mary, who is a dancer, wants to go to the ballet with us.

Just as with presuppositions, the implications triggered by CIs and NRRCs pass the Family-of-Sentences tests and are unaffected when embedded under the operators in the Family-of-Sentences. The example in (51) and (52) illustrate the embedding constructions for both CIs and NRRCs.

(51) a. Did that son of a bitch pay me the money he owes me?
b. If that son of a bitch didn't pay me the money he owes me, then I'll quit.
c. Maybe that son of a bitch didn't pay me the money he owes me.
⇒ Speaker has negative attitude toward referent.

(52) a. Does Mary, who is a dancer, want to go to the ballet with us?
b. If Mary, who is a dancer, wants to go the ballet with us, we'll need to buy an extra ticket.
c. Perhaps Mary, who is a dancer, wants to go to the ballet with us.
⇒ Mary is a dancer.

Because the implication triggered by the expressive phrase in (51) and the NRRC in (52) are unaffected by the Family-of-Sentences operators, we have reasonable evidence that they also belong to the category of projective meaning.

While the property of projection is shared across the aforementioned categories of meaning, the question still remains as to why exactly the inferences triggered by presuppositions, CIs and NRRCs are less easily affected than regular entailments. Further, the question as to whether or not this issue is semantic, pragmatic, or perhaps a little bit of both is also still up for debate. I return to this question in § 4.5. However, I first discuss the diagnostics for distinguishing types of projective implications with respect to the properties of strong contextual felicity and obligatory local effect.

3.1.1 Strong Contextual Felicity and Obligatory Local Effect

Tonhauser et al. 2013 provide the first systematic investigation for a language other than English of projective content. Using data from Paraguayan Guaraní (Tupí, Guaraní), they develop a set of tools intended for use as diagnostics for testing projection cross-linguistically. In addition to providing a description for how to develop Family-of-Sentences tests for untrained linguistic consultants, Tonhauser et al. 2013 also consider specific properties within the category of projective meaning, which appeals to the observation that projective triggers and their contents are not part of one homogeneous category. They propose a taxonomy for four classifications of projective contents based on two different properties. The first property is *strong contextual felicity*. Strong contextual felicity refers to the fact that some projective triggers place restrictions on the context in which they can be felicitously used. For example, pronouns in both English and Guaraní require that a salient referent be established, or entailed, by the context. The second property, *obligatory local effect*, refers to the behavior of some projective triggers when embedded under belief-predicates. If a trigger requires that the content of the projective implication be a part of the belief-state of the subject of the belief-predicate (i.e. the holder of the belief), then the implication is said to require its effect to be local, or to have obligatory local effect. In the following sections, I describe the diagnostics in

more detail and provide examples from English to illustrate their implementation more clearly.

3.1.1.1 Strong Contextual Felicity

The observation that certain projective triggers place constraints on their contexts is not a novel one. For some theories of presupposition, it is assumed that for a presupposition trigger to be felicitously used, it must be entailed by the context. However, not all presupposition triggers place constraints on the context (Heim, 1982; Beaver, 1997). Further, CIs and NRRCs are not subject to this constraint at all. This is unsurprising since both CIs and NRRCs can introduce new information into the discourse, while triggers requiring strong contextual felicity are crucially referring back to a salient alternative or referent within the discourse or a referent that is assumed to be part of the common ground of the interlocutors. It should also be noted that some projective triggers give rise to more than one implication, such as third person singular pronouns in English, which means that the context must be controlled with respect to both (or all) implications triggered. In other words, if the projective content of interest is content m , but there is also triggered a projective content n , the context should be positive with respect to n for all contexts. The context should then only vary with respect to being *m-positive* or *m-neutral*.

Because strong contextual felicity is a restriction on the discourse context, an utterance containing the target implication needs to be situated in a context to determine whether not the utterance is acceptable. One contextual environment to test in will lack a salient referent or alternative, which makes it neutral (non-entailing) with respect to the target implication. If the sentence containing the projective trigger is judged to be unacceptable in a neutral context, the utterance should then also be situated in a minimally different positive (entailing) context. If an utterance is judged as unacceptable in the neutral context but becomes acceptable in the minimally different positive context, it provides evidence that the implication has certain requirements not met by the context. In other words, it requires strong contextual felicity. The diagnostic for strong contextual felicity from Tonhauser et al. (2013) is given in (53), which is the diagnostic used to develop the tests discussed later in

this chapter for Kaqchikel.

(53) *Diagnostic for Strong Contextual Felicity:* (Tonhauser et al., 2013, p.76)

Let S be an atomic sentence that contains trigger t of projective content m .

- (i) If uttering S is acceptable in an m -neutral context, then trigger t does not impose a strong contextual felicity constraint with respect to m .
- (ii) If uttering S is unacceptable in an m -neutral context and acceptable in a minimally different m -positive context, then trigger t imposes a strong contextual felicity constraint with respect to m .

To illustrate what the strong contextual felicity diagnostic should look like, I take the third person pronoun *he*, which is hypothesized to require strong contextual felicity with respect to the implication that there is a salient referent. First, the utterance containing the trigger *he* should be situated in a neutral context with respect to the implication that there is a salient referent. Further, the referent must be male since English pronouns reflect gender. In (54), the context preceding the utterance lacks a salient male referent, thus making it neutral with respect to the target implication. The utterance in (54) is judged to be unacceptable in the neutral context with respect to the implication that there is a salient male referent established in the context, so it suggests that *he* requires strong contextual felicity with respect to the salient male referent implication.

(54) [Context: Maria gets on a bus and sits down next to a woman, who she has never met before. The woman turns to Maria and says:]

#He needs money for the bus.

To provide a complete piece of evidence that the lack of referent is indeed the cause of the unacceptability of (54), the utterance is then situated in a minimally different positive context, in which a salient male referent is provided. With this minimal difference, the utterance is now judged as acceptable in the context.

(55) [Context: Maria gets on the bus and sits down next to a woman and man, who she has never met before. The woman turns to Maria and says:]

He needs money for the bus.

The contrast between (54) and (55) shows that the pronouns *he* requires strong contextual felicity with respect to the implication that there is a salient male referent within the discourse context.

For *he*, it was just demonstrated that strong contextual felicity is required with respect to the existence of a salient male referent. However, the pronouns *s/he* also trigger the implication that the referent is human, which is in contrast to *it* as used for non-human referents. Because more than one implication is triggered, the context should be controlled to make clear which implication is being tested. For (54) and (55), the only possible referents are human as indicated by *woman* and *man*. The breakdown in (54) is thus not caused by failure to meet the requirement that the referent is human, which is confirmed by the example in (56).

- (56) [Context: John and Mary are walking through the woods when they see movement ahead, but they can't quite tell what it is. John runs ahead of Mary, who is too far away to see what is going on, and calls back to Mary:]
Don't worry! He's a hunter.

Because the utterance in (56) is acceptable in a context, which is neutral with respect to the human referent implication and positive with respect to the salient referent implication, we can conclude that *s/he* does not require strong contextual felicity to establish that the referent is human.

Turning to a different projective trigger, the factive verb *know* triggers the implication that the content of the complement is true. In (57), the implication triggered by *know* is the truth of the complement, *Terra has two copies of the new J.K. Rowling book*. The context is non-entailing, or neutral, with respect to this implication.

- (57) [Context: You are at the library with your friend, Dale. Unfortunately, you can't find the book you wanted. Your friend, Dale says to you:]
Shawn knows that Terra has two copies of the new J.K. Rowling book.

Since the utterance is judged as acceptable in the given *m*-neutral context, it suggests that *know* places no restrictions on its context with respect to the implication

that the content of the complement is true and is not imposing strong contextual felicity. Further, since the trigger is judged to be acceptable in the *m*-neutral context, there is no need to situate the trigger in a positive context.

I already suggested that CIs and NRRCs impose no constraints on their context since they introduce new information into the discourse context, but no evidence was supplied to support the claim. Taking first the expressive phrase *that bastard*, (58) establishes that the negative attitude of Jennifer toward the referent is unknown prior to its being uttered and further suggests that she generally has a positive attitude toward her boyfriend, thus the context is neutral with respect to the implication *m* that the speaker has a negative attitude toward the referent.

(58) [Context: Jennifer, who normally gushes to her roommate and friends about how wonderful her boyfriend is, comes home from a date with him and says to her roommate:]

That bastard forgot that today is my birthday!

In the *m*-neutral context provided in (58), the utterance containing *that bastard* is judged as acceptable, which provides evidence that there is no strong contextual felicity constraint being imposed by the expressive phrase. In one final example of testing for strong contextual felicity, (59) contains an NRRC, where the content *who teaches math* implies the truth of its contents that the sister does, in fact, teach math. The context provides no information about the sister at all and establishes that the hearer of the utterance, a new student, has no prior knowledge about Bryan, the speaker.

(59) [Context: Bryan is discussing a math assignment with a student who has just moved to the school, Shawn. Bryan says to Shawn:]

My sister, who teaches math, usually helps me with my homework.

The utterance containing the NRRC is acceptable in the supplied neutral context, which leads to the conclusion that the implication contributed by the NRRC does not impose the strong contextual felicity constraint.

In summary, triggers either do or do not impose restrictions on their context with respect to their projective contents. If a given trigger does impose a restriction

requiring a positive context with respect to a projective implication, then the trigger is said to impose strong contextual felicity. If a trigger of a projective content m is felicitous in an m -neutral context, then strong contextual felicity is not imposed.

3.1.1.2 Obligatory Local Effect

Though referred to with different labels in different theoretical frameworks, the property of strong contextual felicity as a property of triggers and their projective contents being less accommodatable is a commonly studied phenomenon. Obligatory local effect, on the other hand, is less familiar and significantly less studied. Obligatory local effect refers to the behavior of triggers when embedded under propositional attitude verbs, modals, and conditionals. For instance, when a proposition containing a projective trigger is embedded under the propositional attitude verb *believe*, the content of the projective implication must be within the scope of the belief-state of the subject of the predicate (i.e. the holder of the belief) in some instances. Consider first the example in (60), which contains the projective trigger *that bastard* embedded under *believe*. The first clause tells us that Maria typically has an overall positive attitude toward Mark. Because the second clause containing the belief-predicate is not interpreted as contradictory between a simultaneous positive and negative attitude towards Mark, the expressive phrase (*that bastard*) does not have local effect here.

- (60) Maria is fond of Mark. She thinks that bastard is coming to her birthday party.

The definition for obligatory local effect from Tonhauser et al. (2013) is given in (61).

- (61) *Obligatory local effect*: a projective content m with trigger t has obligatory local effect if and only if, when t is syntactically embedded in the complement of a belief-predicate B , m is necessarily a part of the content that is targeted by, and within the scope of, B . (Tonhauser et al., 2013, p. 93)

The example in (60) shows that content of the projective implication triggered by *that bastard* does not have its effect locally as determined by the accept-

ability of (60). In contrast, consider the example in (62) with the aspectual verb *stop* in the sentence *Luke stopped smoking*, which gives rise to the implication that previously Luke was a smoker. To test for obligatory local effect, the sentence containing *stop* is embedded under *think*. However, in (62), the implication that Luke was a previous smoker is negated in the (coordinated) second sentence. The utterance is judged to be unacceptable.

(62) #Mark thinks that Luke stopped smoking, and that he never smoked.

Because the sentence in (62) is judged to be unacceptable when the prestate of the aspectual verb *stop* implying that Luke has been a smoker in the past is contradicted by *...and that he never smoked*, it suggests that *stop* requires the projective implication to be a part of the belief-state. Here, Mark is attributed both with the belief that Luke stopped smoking and also that he never smoked, which is evidence that *stop* is subject to obligatory local effect.

In contrast to the contradictory beliefs exemplified in (62), NRRCs can be embedded under a belief-predicate without the content of the projective implication necessarily being a part of the belief-state. In (63), Rick believes that Terra is an English teacher, but the content of the NRRC implicates that Terra is, in fact, a math teacher.

(63) Rick believes that Terra, who teaches math, is an English teacher.

In spite of the contradiction between Rick's belief and the content of the NRRC, the utterance is still felicitous, which means that the projective content of an NRRC need not have its effect locally.

For triggers that impose strong contextual felicity, the test is less straightforward and slightly more challenging to construct. Turning to the additive particle *too*, one implication triggered is that there is a salient alternative established in the context. The fact that it requires salient alternative suggests that strong contextual felicity is also a relevant factor to consider. If no salient alternative is provided in the context, then we expect the trigger cannot be felicitously used in a neutral context. Before testing for obligatory local effect of the trigger, testing for strong contextual felicity is necessary to ensure that the correct property is targeted by the

diagnostic. The test for strong contextual felicity of the implication *m* that there is a salient alternative established in the context is illustrated in (64)-(65). The context in (64) is *m*-neutral, non-entailing context where no one else is eating salad. By minimally changing the context to one in which Alex is also eating a salad instead of a sandwich, the utterance is now acceptable, which is shown in (65).

(64) [Context: Alex is in the break room at work eating his lunch, a sandwich. David, who isn't eating lunch, says to him:]
#Ben is eating a salad, too.

(65) [Context: Alex is in the break room at work eating his lunch, a salad. David, who isn't eating lunch, says to him:]
Ben is eating a salad, too.

After determining that a given trigger imposes strong contextual felicity, that trigger should be tested for obligatory local effect only in *m*-positive contexts in which a salient alternative or referent is provided, so that strong contextual felicity is satisfied. In (66), the projective trigger *too* is looking for a salient alternative with respect to the 'eating a sandwich' proposition. An alternative is established in the discourse, where again we have Alex and Ben eating lunch and both are eating sandwiches. However, the alternative that satisfies the strong contextual felicity constraint is not in the scope of the belief-predicate, meaning that it is not a part of Monica's belief-state.

(66) #Alex is eating a sandwich for lunch, but Monica doesn't know that. She thinks that Ben is eating a sandwich, too.

The utterance is judged to be unacceptable, which means that *too* does have obligatory local effect here with respect to *m* (a salient alternative is established in the context).

Although not exhaustive for the numerous projective triggers in English, the data provided in this section shows that there is quite a bit of variation to consider across projective contents within language. Cross-linguistically, however,

Tonhauser et al. (2013) provide evidence of a strikingly similar pattern of variation for projective triggers in Guaraní. The following sections and the next chapter are aimed at expanding the available studies on cross-linguistic patterns for projective content with data from a third unrelated language, Kaqchikel. The overall goal is to expand our understanding of how projective content is triggered in Kaqchikel but also how it compares to languages like English and Guaraní.

3.2 Projective implications in Kaqchikel

Before one can even begin to test for projection in Kaqchikel, potential projective triggers have to be identified. Given the gap in studies in Kaqchikel and other related languages on this particular category of meaning, determining which constructions are suitable for testing initially relies on what we already know about constructions and lexical items that trigger projection in better studied languages. Using this information serves merely as a starting point for identifying which types of constructions we might expect have the potential to trigger projective content. When first investigating projection for Kaqchikel, I composed a list of lexical items and constructions that were comparable in meaning to English expressions that trigger projective meaning by looking through the descriptive grammar (Rodríguez Guaján and García Matzar, 1997), pedagogical materials with a glossary (Brown et al., 2006, Spanish and English versions), children's books, recorded and transcribed texts, and data from previous elicitations unrelated to the present topic. I provide the compiled list of the linguistic expressions that I investigate in Table 3.1. Note that not all of the items listed in Table 3.1 will be discussed in detail in this chapter and some are reserved for a more detailed discussion in Chapter 6.

For the remainder of this section, I provide examples and a functional description for each of the hypothesized projective triggers. In association with each hypothesized, I note which implication is hypothesized to be triggered by the construction that will be tested for in Ch. 4. Because many particles in Kaqchikel have multiple functions when used in different syntactic positions or when combined with different particles, the goal of the present study is to focus only on the

Projective trigger	Implication(s)
<i>chuq'a</i> 'too,also'	existence of a salient alternative
Definite determiner <i>ri</i> + N	existence of an entity
Demonstratives: <i>ri</i> ', <i>re</i> , <i>la</i>	referent indicated
Possessive + NP	possessive relation
3SG pronoun <i>riya</i>	i. human referent ii. existence of a salient referent
<i>-etamaj</i> 'to learn'	truth of the content of the complement
<i>-nab'ej</i> 'to find out'	truth of the content of the complement
<i>-mestaj</i> 'to forget'	truth of the content of the complement
<i>xa xe/xu</i> 'only'	exhaustive implication
<i>j(u)b'a ma</i> 'almost'	polar implication
<i>yamer</i> 'almost'	polar implication
<i>-ya' ka</i> 'give up/quit'	prestate holds
<i>-chäp</i> 'begin'	prestate holds
<i>chik</i> 'already'	see Ch. 6
<i>ju(n) b'ey chik</i> 'again'	See Ch. 6
<i>majun tä chik</i> 'not anymore'	prestate holds
<i>na</i> 'still'	see Ch. 6
<i>yän</i> 'already'	See Ch. 6
Expressives	positive/negative attitude toward referent
NRRC	truth of the content

Table 3.1: Projective triggers in Kaqchikel

constructions or functions associated with the potentially projective contents. As a part of the functional description, I refer to the alternative functions but make clear which usage is associated with a projective implication.

The additive particle chuq'a

The particle *chuq'a* is similar to the particles *too* and *also* in English and *tambien* in Spanish. Syntactically, the particle does not have a fixed location. It can occur sentence initially as in (67a), sentence finally as in (67b) and sentence medially as in (68). It can also occur within the clause as a connective as in (67c).

- (67) a. *Chuqa' x- ϕ -ki-b'än ri ixoq ixkanul Atitlan ru-b'i'.*
 also PRFV-B3S-A3P-make DET woman volcano Atitlán A3S-name
 'They also named the female volcano Atitlán.'
- b. *Ri k-ajaw ri awäj x-e-to'on chuqa'*
 DET A3P-owners D corral PRFV-B3P-help also
 'The corral owners also helped.'
- c. *Ru-k'in re' pwäq re' x- ϕ -u-log' jun r-ulew ch(u)qa*
 A3S-RN DET money DET PRFV-B3S-A3S-buy one A3S-land also
x- ϕ -b'an ru-choch.
 PRFV-B3S-A3S-make A3S-house
 'With the money, he bought land and also built a house.'

(Méndez, 2005)

- (68) *Emelia chuq'a tajin n- ϕ -u-tij kafé*
 Emelia also PROG IMPF-B3S-A3S-eat coffee
 'Emelia is also drinking coffee.'

If *chuq'a* is triggering a projective implication similar to *too* in English, then each example in (67) containing the particle *chuq'a*, then we can hypothesize that the implication triggered is that there is a salient alternative established in the context. For example, in (67c), the alternative is established within the same sentence. On the other hand, (67a)-(68) refer back to alternatives established in earlier in the discourse (not presented here), so each has a salient established referent meaning *chuq'a* potentially triggers projective content. I return examples such as this in § 4.1 as they relate to the discussion of strong contextual felicity for Kaqchikel projective triggers.

Determiners and demonstratives

The classification of determiners and demonstratives in Kaqchikel includes the particles *ri*, *re*, and *la*. All three function as demonstrative determiners and can also function as demonstrative pronouns. Each demonstrative encodes deixis where the speaker is the deictic center. *Ri* functions more like the definite determiner *the* in

English and is used to indicate the existence of a specific referent, which does not have to be within the sight of the speaker (see (71a)). *Re* and *la* on the other hand are used when the referent is within sight of the speaker. More specifically, *re* is used when the referent is near (see (71b)), and *la* signals that the location of the referent is within sight but further away from the speaker (see (71c)). The consultants I work with describe the difference as using *re* when you can touch the referent, *la* when you can only point, and *ri* is when the referent is in mind but not present. When functioning as determiners, they are the first item in a noun phrase. The ordering of elements in a noun phrase is given in (69) with an example with all elements in (70).

(69) (D) (NUM) (ADJ+) N

(70) *Ri ka'i' jebël ak'wal-a'*
 D two beautiful child-PL
 'The two beautiful children.'

An example of each determiner in use is provided in (71).

- (71) a. *Ri tz'e' tajin n-ø-wär*
 D dog PROG IMPF-B3S-sleep
 'The dog is sleeping.'
- b. *La tz'e' tajin n-ø-wär*
 D dog PROG IMPF-B3S-sleep
 'That dog (over there) is sleeping.'
- c. *Re tz'e' tajin n-ø-wär*
 D dog PROG IMPF-B3S-sleep
 'This dog (right here) is sleeping.'

The determiners can also be doubled for emphasis, in which case one determiner precedes the noun and the second is placed after the noun. The only difference between the pre-nominal and post-nominal form is that the post-nominal form ends with a phonemic glottal stop.

- (72) a. *ri wuj ri*
 D book D
 ‘the book’
- b. *la wuj la*
 D book D
 ‘that book there’
- c. *re wuj re*
 D book D
 ‘this book here’

As for the demonstrative pronoun function, the above doubling is also used except, of course, there is no intervening noun.

- (73) a. *Riri’ w-ichin*
 D.PRO A1S-RN
 ‘That’s mine.’
- b. *Lala’ w-ichin*
 D.PRO A1S-RN
 ‘Those are mine’
- c. *Rere’ w-ichin*
 D.PRO A1S-RN
 ‘These are mine.’

For both determiner and pronominal functions, *ri*, *re*, and *la* are hypothesized to trigger the implication that there is a salient referent established. While the referent for the determiners is indicated by the noun, the demonstrative pronouns are referring either to a referent established earlier in the discourse (namely for *riri*’) or by pointing or touching the suitable referent.

Possessive + NP

For possessive predication, the hypothesized projective implication is the possessive relation. Possessive predication in Kaqchikel can be formed in more than one way, two of which will be discussed here. The first construction marks for agreement with the possessor on the possessed argument using the Set A (ergative) markers.

	SG	PL
1st	<i>wichin</i>	<i>qichin</i>
2nd	<i>awichin</i>	<i>iwichin</i>
3rd	<i>richin</i>	<i>kichin</i>

Table 3.2: Possessive pronouns in Kaqchikel

- (74) a. *Riri' nu-wuj.*
 D.PRO A1S-book
 'That is my book.'
- b. *Rere' a-wuj*
 D.PRO A2S-book
 'This is your book.'
- c. *Lala' ki-wuj*
 D.PRO A3P-wuj
 'Those are their books.'

Possessive predication can also be formed using possessive pronouns rather than just the Set A agreement markers, which is similar to the possessive pronouns *his/hers*, *mine* and *theirs* in English. The possessive pronouns are formed using the relational noun *-ichin* and agreement with possessor marked with Set A agreement markers. The full paradigm of possessive pronouns is given in Table 3.2. Examples of the possessive pronouns used in a sentence are given in (75).

- (75) a. *La wuj la' aw-ichin rat.*
 D book D A2S-RN 2S
 'That book there is yours.'
- b. *Ri mes q-ichin roj.*
 D cat A1P-RN 1P
 'The cat is ours.'

For this type of possessive predicate, the possessive relation is between the possessive pronoun and the overt NP expressed in the utterance (i.e. NP + Possessive).

Finally, possessive predicates can also be formed using proper names and a possessed argument marked with the Set A agreement marker, which is equivalent

to *John's cat* in English. There is no special marking on the proper name, and the only indication of the possessive relation is the Set A agreement marker on the possessed NP argument. The two arguments are adjacent with the possessed argument preceding the possessor.

- (76) a. *Ru-tz'i' Maria jun yalan nīm tz'i'*
 A3S-dog Maria one very large dog
 'Maria's dog is very large.'
- b. *R-ochoch Juan jeb'ël*
 A3S-house Juan beautiful
 Juan's house is beautiful.

The crucial element for each of the possessive constructions discussed is that they all indicate a relationship of possessor and possessed, where the possessor is always indicated using Set A agreement morphology.

While the examples in this section have described the more common possessive relation type, there is an additional possessive construction, which is used to mark future possession or change of possession with ditransitive verbs, such as *ya* 'give'. The construction is used to encode an additional indirect benefactive or recipient argument as an alternative to using an oblique phrase, though both options are available. An example of this construction is given in (77).

- (77) *Juan x-ø-r-ya' jun nu-wuj.*
 Juan PRFV-B3S-A3S-give one A1S-book
 'Juan gave me a book. (lit. 'Juan gave one my book.')

While the lexical semantics of this construction is cross-linguistically interesting with respect to the encoding arguments of the verb, the possessive relation implication of interest for the present study is less clearly diagnosable and thus set aside for future evaluation.

Pronouns

In § 2.1.3, I noted that independent pronouns in Kaqchikel are used only for emphasis and to reintroduce an argument into the discourse. Minimally, a sentence with

a finite verb is grammatically well-formed with just the fully inflected verb so long as the referents are salient in the discourse context for non-local arguments (i.e. 3rd person arguments).

- (78) a. *Y-at-in-tz'ët*
 IMPF-B2S-A1S-see
 'I see you.'
- b. *N-ø-in-tzët*
 IMPF-B3S-A1S-see
 'I see him/her.'
- c. *Y-e-ki-tzët*
 IMPF-B3P-A3P-see
 'They see them.'

However, full pronouns can be used when a speaker wishes to emphasize the argument or re-introduce an argument already established earlier in the discourse. Independent pronouns are only used only for human arguments, which differs from a language like English where pronouns exist for both 3rd person human referents (*s/he*) and for non-human referents (*it*). In a context where only a non-human referent is salient, an utterance with *riya'* (3S) or *riye'* (3P). the utterance is judged as infelicitous in the given context, which is shown in (79).

- (79) a. *x-ø-in-tz'ët* *jun tz'e'*. #*Riya' nìm.*
 IMPF-B3S-A1S-see one dog 3S large
 'I saw a dog. #S/he was large.'
- b. *x-ø-in-tz'ët* *ya Maria. Riya' jebël*
 IMPF-B3S-A1S-see CL Maria 3S beautiful
 'I saw Maria. She is beautiful.'

When the 3S and 3P independent pronouns are used, it is hypothesized that they give rise to the implication that there is a salient referent established in the context, and additionally that there is an implication that the referent(s) must be human. In the case of (80), the pronoun *rije'* refers to animals that are anthropomorphized and further that were previously human, so it fits the pattern of overt third person pronouns only referring to humans.

- (80) *Xa man tikirel tä n-i- ϕ -ki-qum ri ki-k'ikel ri chikop-i'*
 PAR NEG possible IRR IMPF-EP-B3S-A3P-drink D A3P-blood D animal-PL
ri y-e-ki-kamisaj. We ri je' n-i- ϕ -ki-qum qa ri kik'
 D IMPF-B3P-A3P-kill. COND 3P IMPF-EP-B3S-A3P-drink DIR D blood
manaq chik xk-e'-ok tä winäq
 NEG PAR POT-B3P-enter NEG people

'It's not possible for [those people who were turned into jaguars]to drink the blood of the animals they kill. If they drink the blood, they cannot become human again.'

(Méndez, 2005)

Factives

Factive verbs (or factive predicates) are predicates that represent the epistemic state of the subject of the predicate. While belief-predicates also represent the epistemic state of the subject, belief-predicates lack the factive presuppositions. In other words, only the complements of factive predicates give rise to the implication that its content is true. An example of the difference between the truth-conditional implications between factive and belief-predicates for English is given in (81).

- (81) a. Mary knows that John is sick.
 \Rightarrow John is sick.
 b. Mary thinks that John is sick.
 \nRightarrow John is sick

Factive predicates in Kaqchikel are formed using factive verbs, such as *-nab'ej* 'to learn/find out' or *-mestaj* 'to forget'. Additionally, though the root is verbal, the predicate meaning 'know' is actually a non-verbal predicate formed with the perfect (de-verbal) suffix. The verb root for the 'know' factive construction is derived from the verb *-etamaj* 'to learn/come to know'. Both verbal and non-verbal factives introduce a complement clause embedded under the relativizer *chi*. If these factive predicates in Kaqchikel are similar to English, then we might expect that there is an

implication that the content of the complement is true, which is shown in (82).¹

- (82) a. *Juan ru-tama-n chï Marta k'o wawe'*.
Juan A3S-learn-PRF REL Marta EXST here
'Juan knows that Marta is here.'
Hypothesized implication: Marta is here.
- b. *Ambrocia x-u-nab'ej chï k'o nimaq'ij chwaq*
Ambrocia PRFV-B3S-find.out REL EXST party tomorrow
'Ambrocia found out that there is a party tomorrow.'
Hypothesized implication: There is a party tomorrow.
- c. *Rigo x-u-mestaj chï wakx n-ø-ki-täj q'ayis.*
Rigo PRFV-B3S-forgot REL cows IMPF-B3S-A3P-eat grass
'Rigo forgot that cows eat grass.'
Hypothesized implication: Cows eat grass.

In addition to factive predicates of the type in (82), there are also emotive factives that potentially give rise to the same factive implication, such as *to be happy that X* and *to be sad that X*. Some Kaqchikel emotive factives are given in (83).

- (83) a. *Rigo n-ø-b'ison r-uma tajin n-ø-(b)'an jab'*.
Rigo IMPF-B3S-sad A3S-RN PROG IMPF-B3S-do rain
'Rigo is sad that it is raining.'
Hypothesized implication: It's raining.
- b. *Rigo ki' k'ux chï tajin n-ø-(b)'an jab'*.
Rigo sweet heart REL PROG IMPF-B3S-do rain
'Rigo is happy that it is raining.'
Hypothesized implication: It's raining.

¹I did run tests with speakers to determine if the implications indicated in (82) are actually triggered by asking speakers how likely they believe it is that the implication is true (e.g. 'How likely is it that there is a party tomorrow?'). I contrasted the responses with those from the same complement clauses embedded under *-qu* 'think'. Interestingly, speakers consistently judged the likelihood of the factive complements to be 'very likely' but the responses for *-qu* were much less likely across speakers, though some responded with something along the lines of 'You can't tell in this sentence. Maybe there is, maybe there isn't', which suggests that the factive implication is not triggered by *-qu*.

On the other hand, the belief-predicate with the verb *-qu* ‘think’ does not seem to trigger the same factive implication.

- (84) a. *Juan n-u-qu chï Marta k’o wawe’.*
 Juan IMPF-B3S-think REL Marta EXST here
 ‘Juan thinks that Marta is here.’
 ⇏Marta is here.
- b. *Ambrocia n-u-qu chï k’o nimaq’ij chwaq*
 Ambrocia IMPF-B3S-think REL EXST party tomorrow
 ‘Ambrocia thinks that there is a party tomorrow.’
 ⇏There is a party tomorrow.

The exclusive particle(s) xa and xe/xu

The particles *xa* and *xe/xu* can either occur together as *xa xe/xu*. Examples from the grammar and texts from other dialects tend to use *xe*, but the speakers I work with all use *xu* or independently. *Xa* has a wider range of functions than *xe* including as a contrastive conjunction, part of an optative conditional construction (akin to *if only*), as well as the exclusive particle. In (85) *xa* combines with the focus particle *ja* and the determiner *ri* to form the contrastive conjunction, while (86) illustrates the optative conditional construction.

- (85) *Y-e-ru-k’ul-ula’ winaq-i’ xa ja ri manaq*
 IMPF-B3P-A3S-meet-PL.IND people-PL PAR FOC D NEG
y-e-ch’on tä chi-re
 IMPF-B3P-speak IRR PRE-3S
 ‘He met the people one by one, but they didn’t speak to him.’²

(Méndez, 2005)

²The suffix *-Vla’* is a pluractional suffix that indicates that multiple events are denoted by the predicate, and more specifically that the each event of meeting a person was individual (i.e. one by one). For a more detailed analysis of pluractional events see Henderson (2012).

- (86) *Ri Marco xa tä x-i-pe ch-u-pan ri nimaq'ij, yin*
 D Marco PAR IRR PRFV-EP-come PRE-B3S-RN.INSIDE D party 1S
x-in-xajo tä
 PRFV-B1S-dance IRR

'If only Marco had come to the party, I would have danced.'

It is possible for both *xa* and *xe* to appear alone, and in both cases the meaning is similar to *only* or *just*. The hypothesized implication triggered in (87), which is referred to as the mirative implication in Beaver and Clark (2003), is also observed for English exclusive particles. The mirative implication is that the prejacent is short of one's expectations. That is, (87) seems to imply that it might be expected that the man be more than a vendor, and in (88) one might expect the chair to be an actual chair rather than just an armadillo to sit upon. The example in (88) contains both *xa xe* and *xa* alone, of which only the latter triggers the mirative implication.

- (87) *Tat, rin xa in-k'ayin-el*
 VOC 1S PAR A1S-sell-NOM

'Sir, I am just a vendor.'

(Méndez, 2005)

- (88) a. *Ri ixöq x-u-b'ij chi re chi ti-ø-tz'uy-e'*,
 D woman PRFV-B3S-say REL D REL IMP-seated-ITV

'The woman said to him, 'Sit down,'

- b. *xa xe k'a chi ri ch'akät k'oj ch-u-pam ri jay xa*
 PAR PAR PAR PRE D chair EXST PRE-A3S-stomach D house PAR
jun ib'oy.

one armadillo

'Only the chair inside the house was just an armadillo.'

(Méndez, 2005)

Xe can also appear alone, which is illustrated in (89).

- (89) *Xe jun ch'uti ramaj x-e-b'iyin x-e'-ul-qa akuchi'*
 PAR one DIM hour PRFV-B3P-walk PRFV-B3P-arrive-DIR.down where
x-ki-k'ul wi ki' nab'ey mul
 PRFV-A3P-meet TR 3P.REF first time
 'They had only been walking a few minutes when they came upon the place
 where they had first met.' (Méndez, 2005)

Finally, (90) and (91) show the combined form *xa xe*. When *xa xe* is used, the translation is always 'only' or 'just'.

- (90) *K'iy al, xa xe x-ki-tz'ët re kam-inäq kej re' chanim*
 many bird PAR PAR prfv-B3P-saw D die-PRF.ITV horse D quickly
x-e-qa chi ru-tij-ik
 PRFV-B3P-descend PRE A3S-eat-NOM
 'Many birds, just as they saw the dead horse, quickly flew down to eat it.'
 (Méndez, 2005)

- (91) 'Atux r-uma xa xe rija' r-il-om ru-way,'
 INT B3S-RN PAR PAR 3P A3S-provide-PRF.TV A3S-food
x-e-cha.
 PRFV-B3P-say
 'Why is it that he is the only one who has found food, they said.'
 (Méndez, 2005)

The particles j(u)b'a ma and yamer

The next constructions of relevance are *j(u)b'a ma* and *yamer*. *J(u)b'a ma* is composed of the particle *j(u)b'a* 'a little bit' and the negative particle *ma*, so it has the literal meaning of 'a little bit not.' As for *yamer*, it is likely borrowed into Kaqchikel from Spanish *ya mero* 'almost'. The function of the two constructions is similar to *almost* in English, which triggers the implication that whatever is modified by *almost* is not the case. For example, *Harrison almost broke his leg* implicates that Harrison's leg is in no way broken. For Kaqchikel *j(u)b'a ma* and *yamer* the function is the same. They take the event or attribution, *X*, which they modify and trigger the polar implication ($\neg X$).

- (92) a. *j-b'a ma x-i-r-pitz' ka j-ch-ich' pa b'ey*
 ONE-LITTLE NEG PRFV-B1S-A3S-squash PAR ONE-car PRE street
 'I was almost squished by a car in the street.'
 ⇒ I was not squished by a car.
- b. *R-al yamer x-i-käm*
 A3S-child almost PRFV-EP-die
 'Her child almost died.'
 ⇒ The child did not die.

The next example comes from one of the children's texts, which tells of why some animals seem almost human. The use of *jub'a' ma* is in (93d).

- (93) a. *Re winaq-i' re' man x-e-käm tä xa*
 D people-PL D NEG PRFV-B3P-dieIRR PAR FOC
ja x-ø-ki-po' kan ki' chikop,
 PRFV-B3S-A3P-become INTS 3P.REF animals
 'These people didn't die, but instead they became animals.'
- b. *k'o x-e'-ok k'oy, aq'a'-winäq, k'o x-e'-ok*
 EXST PRFV-B3P-enter monkey night-people EXST PRFV-B3P-enter
kan b'ay
 INTS mole
 'There are some that became monkeys, raccoons, there are some that became moles.'
- c. *R-uma ri' ri chikop-i' k'o ki-no'jib'äl*
 A3P-RN D D animal-PL EXST A3P-wisdom.
 'Because of this, the animals have wisdom.'
- d. *e-k'o ri kan ju-b'a' ma winäq n-ø-ki-b'än chuq'a*
 B3P-EXST D INTS one-little.bit NEG people IMPF-B3S-A3P-do
ke ri' ki-b'anikil.
 also PAR D A3P-form
 'There are some that are almost like humans and so does their shape.'

(Méndez, 2005)

Aspectual verbs

Lexical aspectual distinctions for verbs in Kaqchikel based on the standard Vendler verbal classifications for statives, activities, accomplishments, and achievements are the most commonly discussed lexical aspect classifications. In Hendrick-Krueger (1986), a detailed investigation of lexical aspect of Kaqchikel verb roots provides evidence that the standard classifications of verbs apply to Kaqchikel (though notably stative verbal predicates are quite few in number). When talking about aspectual verbs in the context of projection, I refer to verbs like *stop*, *begin*, *continue*, etc., which trigger an implication that there is a time at which the prestate with respect to the event denoted by the aspectual verb holds. For example, *John stopped smoking* presupposes that there was a time at which John previously smoked. On the other hand, for *John began smoking* there is a presupposition that previously John was not a smoker. In Kaqchikel, the verbal roots *-yaka* ‘give up’ and *-chäp* ‘begin’ potentially trigger the prestate implication as well. In (94), there is an implication that Juan was previously a smoker, and in (95) the implication is that the woodpecker had not been previously digging a hole in the stone.

(94) *Juan x-u-yaka sik'*
Juan PRFV-B3S-give.up smoke
‘Juan quit smoking.’

(95) *Ri tuktuk x-u-chäp ru-k'ot-ik ri ab'äj ru-k'in ru-tza'm.*
D woodpecker PRFV-B3S-begin A3S-dig-NOM D stone A3S-RN A3S-nose
‘The woodpecker began to drill the stone with its beak.’

(Méndez, 2005)

Similarly, the construction *ma(n)...tä chik* ‘not anymore’ also presupposes that the prestate of the eventuality holds, which in (96) is the state of starvation or hunger.

(96) *...man jun b'ey tä chik xt-i-q'ax-aj wayijal pan i-k'aslem*
NEG one time IRR PAR POT-A2P-remain- hunger PRE A2P-life
‘You will no longer be hungry in your life.’

(Méndez, 2005)

I return to a more detailed discussion of the other functions of the particle *chik* in Chapter 6.

Expressives

Expressive phrases are phrases that convey either a positive or negative attitude toward the referent, such as *that bastard* or other expletive phrases and epithets like *piece of shit*. Since descriptive grammars, texts, and other work on Kaqchikel tend to not include expressive phrases, the examples given here are the result of elicitation only. The examples were primarily provided by one particular speaker and then confirmed with two other speakers that I have worked with the longest given that expressive phrases can be considered offensive. The first phrase, *ri kite' tz'e'* ‘mother of dogs’, is similar to *bitch* in English.³ The second phrase, *ri way küch* ‘food of vultures’ is also a phrase used to refer to people that conveys a strongly negative attitude.

- (97) a. *Ri ki-te' tz'e' ma x-ø-töj tä nu-q'ij*
 D A3P-mother dog NEG PRFV-B3S-pay IRR A1S-daily
 ‘That son of a bitch didn’t pay me my (daily) wage. (Lit. The mother of dogs...’)’
- b. *Ri way küch x-ø-leq'aj nu-rajil!*
 D food vulture PRFV-B3S-steal A1S-money
 ‘The food of vultures stole my money!’

NRRCs and nominal appositives

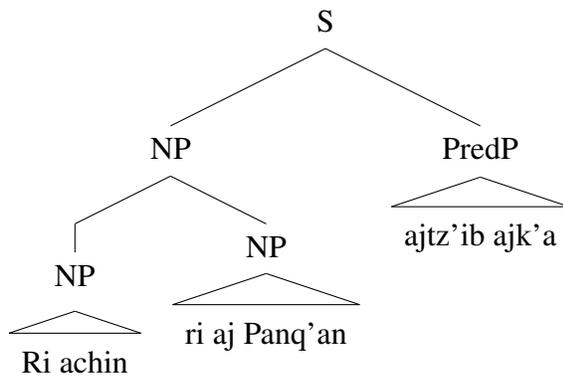
The final two constructions considered for projectivity are the non-restrictive relative clause (NRRC) and the nominal appositive. On the surface, the two constructions can appear identical if the content of the NRRC is non-verbal (e.g. *Rigo, a teacher* vs. *Rigo, who is a teacher...*), and Rodríguez Guaján and García Matzar (1997) suggest that there are two possible interpretations for examples like (98)

³This is my interpretation of the phrase based on the explanation of the consultant that provided the form because direct translations of idiomatic and expressive phrases are not always possible.

with two possible underlying syntactic structures. The NRRC/nominal appositive is the bracketed phrase. The trees in (99) and (100) are the proposed syntactic structures for both the nominal appositive and the NRRC. Because the determiner *ri* can function both as a definite determiner and as a demonstrative pronoun that heads relative clauses, there is an ambiguity between being a noun phrase *the man from Antigua* and the relative clause *the one who is from Antigua*.

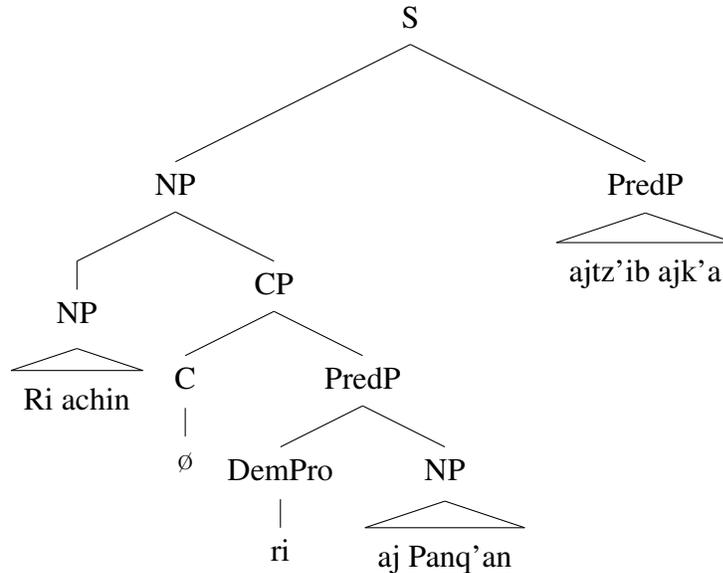
- (98) *Ri achi [ri aj Panq'an]aj-tz'ib' ajk'a*
 D man D from Antigua AGT-write PAR
 'The man, the (one) from Antigua, is a writer/The man, who is from Antigua, is a writer.' (Rodríguez Guaján and García Matzar, 1997, p. 263)

- (99) *Nominal Appositive*



(Based on Rodríguez Guaján and García Matzar (1997, p.263))

(100) *NRRC*



(Based on Rodríguez Guaján and García Matzar (1997, p.263))

The content of the NRRC can also be verbal, such as in *Ron, who runs marathons, is tall*. For both verbal and non-verbal NRRCs, the determiner *ri* introduces the clause as in (98) for the phrase *ri aj Panq'än*. An example of a verbal NRRC headed by a *ri* is given in example (101a). It is worth noting that the verbal/non-verbal distinction is clear in Kaqchikel but not really the case for the English counterparts because the English NRRCs are headed by a relative pronoun, such as *who*. In Kaqchikel, NRRCs can also contain a relative pronoun, such is *ach(i)ki* in (101b). Note, however, that the clause is still introduced by the determiner *ri*.

- (101) a. *x-∅-in-leq'a-j ri kaxlan-wäy [ri k'o kä ch-upan*
 PRFV-B3S-A1S-steal-TV D foreign-food D EXST DIR PRE-stomach
kaq-a-läq]
 RED-EP-plate
 'I stole the bread, which was inside the red dish.'

(Guarcax González, 2016, p.179)

- b. *x-qe-r-tz'ät* *kä a-chaq'* *myer* [*ri achki* *k'o*
 PRFV-B1P-A3S-see DIR A2S-brother a.while.ago D REL.PRO EXST
ru-ch'ich']
 B3S-car

‘We saw your brother, who has a car, a while ago.’

(Guarcax González, 2016, p.179)

In the next section, the relevant implication under investigation associated with NR-RCs and nominal appositives is the assumption that their content is true.

One final point of interest on relative clauses emerges from a recent study of the relative clause types in the Sololá dialect of Kaqchikel in Guarcax González (2016). In addition to providing syntactic criteria for distinguishing between restrictive and non-restrictive relative clauses, he provides acoustic evidence that even when structurally NRRCs and restrictive relative clauses appear to be similar, they are distinct. He observes that there is a significant pause before NRRCs but not for the restrictive relative clauses.

3.2.1 The Family-of-Sentences for Kaqchikel

Now that a suitable set of linguistic expressions hypothesized to trigger implications has been described, I move to determining how to set up the Family-of-Sentences diagnostic in Kaqchikel. In order to ensure that the embedding constructions in Kaqchikel are targeting entailments but not projective implications, both potentially projective and non-projective implications are considered. If an implication is affected when embedded under these operators, then it suggests that the implication is an entailment rather than a projective implication. In contrast, any implication that is unaffected by the embedding is a potentially projective implication. The constructions used to test for projection are described in the following sections including negation, polar question formation, conditionals, and possibility modal constructions.

Negation

Negation in Kaqchikel is generally formed by the negative particle *ma(n)*, which preposes the element being negated, and the irrealis marker *tä*, which postposes the element being negated, creating a frame. The frame can be placed around a verb (102a), an adverbial phrase (102b), a noun (102c), a stative predicate (102d), and a prepositional phrase (102e). In other words, many phrase types can be the negated using the *man...ta* frame.

- (102) a. *Man x-ø-biyin tä ri ti ak'wal*
NEG PRFV-B3S-walk IRR D DIM child
'The little child didn't walk.'

(Rodríguez Guaján and García Matzar, 1997, p. 276)

- b. *Man iwir tä xuk-ul ri tat*
NEG yesterday IRR kneel-ADJ.P D older.man
'It wasn't yesterday that the man was kneeling.'

(Rodríguez Guaján and García Matzar, 1997, p. 293)

- c. *Man jun po't tä x-ø-u-löq' nu-tata'*
NEG one huipil IRR PRFV-B3S-A3S-buy A1S-father
'It wasn't a huipil that my father bought.'

(Rodríguez Guaján and García Matzar, 1997, p.269)

- d. *Jeremias man k'o tä wawe'.*
Jeremias NEG EXST IRR here
'Jeremias is not here.'

- e. *Man pa juyu' tä b'e-näq wi ri ma Tok'*
NEG PRE mountain IRR go-PRF.ITV TR D CL Tok'
'It wasn't a mountain that Tok' has gone to.'

(Rodríguez Guaján and García Matzar, 1997, p. 293)

While a negated phrase can remain *in situ*, there are instances of movement of the negated element to topic position (i.e. preverbal). One example of a preverbal negated argument was already given in (102c), where the object *jun po't* is negated.

The base form with the basic VOS word order from which (102c) is derived is given in (103a). The subject of the transitive verb can also directly be negated and moved to topic position as in (103b). However, when the subject of a transitive verb is negated and topicalized, the verb is antipassivized and the agent/subject argument is no longer marked on the verb.

- (103) a. *X- ϕ -u-löq' jun po't nu-tata'.*
 PRFV-B3S-A3S one huipil A1S-father
 'My father bought a huipil.'
- b. *Man nu-tata' tä x- ϕ -loq'-o ri po't*
 NEG A1S-father IRR PRFV-B3S-buy-AP D huipil
 'It wasn't my father who bought the huipil.'

(Rodríguez Guaján and García Matzar, 1997, p. 269)

Finally, when negation occurs with a phrase containing multiple particles, the negative adverb *ma(n)* still precedes the argument. However, in cases when there is a directional involved, the irrealis marker follows all other intervening particles except for the directional, which is illustrated in (104).

- (104) *Man k'a ke taq la' tä apo x-e-wa' wi ri akwal-a'.*
 NEG PAR PAR PL D IRR DIR PRFV-B3P-eat TR D child-PL
 'It wasn't there that the children ate.'

(Rodríguez Guaján and García Matzar, 1997, p. 299)

With respect to setting up the negation diagnostic for the Family-of-Sentences in Kaqchikel, the goal is to embed the projective trigger under negation. For instance, the factive construction using *-etamaj* is negated in (105) using the negation frame *ma(n)..tä* around the predicate *rutaman*.

- (105) *Jeremias man ru-tama-n tä ch'i k'o nimaq'ij chwaq.*
 Jeremias NEG B3S-learn-PRF.TV IRR REL EXST party tomorrow
 'Jeremias doesn't know that there is a party tomorrow.'

Because consultants judged (105) to be an acceptable utterance, we know that it can be used in the diagnostic for projection for the factive predicate in Kaqchikel.

Polar questions

Polar questions in Kaqchikel can be formed in one of two ways: using clause final rising intonation or with the interrogative particle *la*. When the interrogative particle *la* is used, it always occurs in first position, which is shown in (106a) and (106b).

- (106) a. *La ütʒ a-wäch?*
Q good A2S-face
'How are you? (lit. Is your face well?)
- b. *La tzij?*
Q word
'Is that true?'

The consultants that I work with report that they rarely use the interrogative particle *la*, so taking that into consideration I only used rising intonation when setting up the diagnostic to test for projection as illustrated in (107).

- (107) a. *K'a k'o na Jeremias pa Sololá?*
PAR EXST PAR Jeremias PRE Sololá
'Is Jeremias still in Sololá?'
- b. *Rin y-in-b'eyaj ,ja k'a rat?*
1S IMPF-B1S-stroll FOC PAR 2S
'I'm going for a stroll, and you?'

When asked whether or not (107a) and (107b) were acceptable, all speakers judged them to be acceptable question formation for polar questions. Thus, the embedding under a question operator using rising intonation is suitable for setting up the diagnostic for projection in Kaqchikel.

Conditionals

In dialects considered closer to a standardized variant of Kaqchikel, conditionals are formed using the particle *we*. *We* can also be reduced and appear as clitic, *w=*, attaching to the first element in the conditional clause. Additionally, there is an allomorph *u=* used as well (see (110a)). The first example in (108a) appears in a

written text representative of a standardized version of Kaqchikel, but the example in (108b) is representative of the Sololá dialect as described in Guarcax González (2016).

- (108) a. *We man y-in-a-tij ta n-in-sipaj jun*
 COND NEG IMPF-B1S-A2S-eat IRR IMPF-B1S-give.a.gift one
ch-a-we
 PRE-A2S-RN
 ‘If you don’t eat me, then I will give you one.’
- b. *w=n-ø-a-k’is ch’aj-on, n-ø-in-ya’ jun*
 COND=IMPF-B3S-A2S-finish wash-NOM IMPF-ø-A1S-give one
a-kab’
 A2S-sweet
 ‘If you finish the washing, I will give you a candy.’

(Guarcax González, 2016, p. 36)

Although the examples from Guarcax González (2016) are based on the same dialect as the consultants that I work with, the *we* conditional was dispreferred by consultants. In fact, most consultants I work with report that they tend to use Spanish *si* to form a regular conditional, as in (109).

- (109) *Si xa oxi’ x-ø-leq’aj al, rin ki’ nu-kux*
 COND.SP PAR 3 PRFV-B3S-steal DIR 1S sweet A1S-heart
 ‘If he stole only three, then I’m happy.’

In spite of the fact that speakers in natural speech generally used the borrowed *si* from Spanish, consultants would avoid using this construction in elicitation sessions. When I set up the Family-of-Sentences tests using the Spanish *si*, such as with the construction in (109) consultants would always try to correct the sentence to what they refer to as ‘pure’ Kaqchikel. In order to avoid this issue, I wound up using one of two optative conditional constructions. The first uses the *u* allomorph of the *we* conditional marker and the exclusive particle *xa* as shown in (110a). The second is what Rodríguez Guaján and García Matzar (1997) refer to as irrealis conditionals. They are also formed using *xa* along with the irrealis particle *tä*, but lack the conditional marker as shown in (110b).

- (110) a. *U xa n-a-wajo? n-φ-ya' ch-a-wä wkami*
 COND PAR IMPF-B2S-want IMPF-B3S-give PRE-A2S-RN now
 'If you want, I can give it to you now.'
- b. *Ri Marco xa tä x-φ-pe ch-u-pan ri nimaq'ij, yin*
 D Marco PAR IRR PRFV-A3S-come PRE-B3S-stomach D party 1S
x-i-xajon tä
 PRFV-B1S-dance IRR
 'If Marco had come to the party, I would have danced.'

For the purposes of testing for projection, I primarily used the *xa tä* construction because there was some variation for grammaticality judgments for the *u=xa* construction. Using the factive construction to illustrate embedding under the conditional, the entire sentence containing the factive implication is in the antecedent of the conditional, which is shown in (111).

- (111) *Xa tä Jeremias ru-tama-n chi k'o nimaq'ij chwaq,*
 PAR IRR Jeremias A3S-learn-PRF.TV REL EXST party tomorrow
n-φ-kiköt.
 IMPF-B3S-be.content
 'If (only) Jeremias knows that there is a party tomorrow, then he is happy.'

Possibility modals

The final embedding construction used to test for projective implications is under possibility modals, such as *might*, *perhaps*, *maybe* or *it is possible that...* in English. Rodríguez Guaján and García Matzar (1997) provide a list of adverbs of doubt including *ruk'in jub'a'* (lit. with him/her a little bit), *ma xa* (NEG+the exclusive particle), as well as *k'a te ta*. They provide examples for two of the expressions, *ruk'in jub'a'* as shown in (112a) and *k'a te ta* as shown in (112b).

- (112) a. *R-uk'in ju-b'a' n-φ-pe r-uma kan*
 A3S-RN.with one-little.bit IMPF-B3S-come A3S-RN.because PAR
ojer chik.
 long.ago PAR
 'Possibly h/she will come because it has been a long time since h/she has come.'

- b. *K'a te ta k'o n-ø-u-k'äm pe chi q-e*
 PAR PAR IRR EXST IMPF-B3S-bring DIR PRE A1P-RN
 'Maybe s/he will bring us something.'

(Rodríguez Guaján and García Matzar, 1997, p.205)

I took these examples to my Sololá consultants, and they said that they would not use any of the above forms to express possibility or introduce doubt. Instead, they prefer to simply use the irrealis marker in its longer form *taj*, which is the construction shown in (113).

- (113) a. *Taj Jeremias k'a k'o na pa Sololá*
 Perhaps Jeremias PAR EXST PAR PRE Sololá
 'Perhaps Jeremias is still in Sololá.'

- b. *Taj k'o jun j(u)na'.*
 Perhaps EXST one year

'Maybe there is a year.'

(Guarcax González, 2016, p. 95)

There are perhaps other ways of expressing possibility for the speakers that I work with, but embedding under the irrealis marker suffices as a construction that projective implications are unaffected by but does target the assertions and entailments of the sentence. For example, in (114) the factive construction is embedded under *taj*.

- (114) *Taj Jeremias r-utema-n chi k'o nimaq'ij chwaq.*
 IRR Jeremias A3S-learn-PRF.TV REL EXST party tomorrow
 'Perhaps Jeremias knows that there is a party tomorrow.'

⇒ There is a party tomorrow.

⇒ Jeremias knows about the party.

If the factive implication that there is a party tomorrow scopes out of the scope of negation, but the implication that Jeremias knows about said party is no longer part of the asserted content, then we have evidence that the content contributed by the complement of the factive is projective. Because speakers judged (114) to be acceptable, this particular possibility modal construction is used in the diagnostic for projective content in Kaqchikel.

3.3 Summary

The diagnostics described in this chapter for projection, strong contextual felicity, and obligatory local effect are useful tools to test implications in a given language in order to gain a deeper understanding of how presuppositions and conventional implicatures behave cross-linguistically. In the next chapter, I take the potential projective triggers in Kaqchikel that give rise to the hypothesized projective implications that I described in the present chapter and test whether or not they are projective starting with the Family-of-Sentences embeddings described in the final section of this chapter.

Chapter 4

Projection in Kaqchikel

As already mentioned, even amongst the category of projective implications not all implications behave uniformly. Some implications place constraints on their context and require that the context be positive, or entailing. Additionally, there are implications that must have local effect when embedded under propositional attitude verbs, while other triggers need not have their effect locally. In the present chapter, I test for projection as well as strong contextual felicity and obligatory local effect for the Kaqchikel projective triggers described in Ch. 3. Adopting the methods from Tonhauser et al. 2013, I begin by testing for strong contextual felicity across the Kaqchikel implications because strong contextual felicity affects the contexts in which a trigger can be situated for projection and local effect embeddings. I then turn to the Family-of-Sentences and belief-predicates for Kaqchikel using the embedding constructions outlined in the previous chapter. In the final section, I turn to the pragmatic concept of at-issueness in order to discuss the interaction between being not-at-issue and being projective, which is motivated by recent proposals discussed in Simons et al. (2010), Tonhauser (2012), Abrusán (2011) and Abrusan (2016) with the goal of addressing the issue that some projective implications are less easily cancelled or accommodated than other projective implications.

4.1 Strong contextual felicity with Kaqchikel triggers

Strong contextual felicity refers to whether or not a projective trigger places constraints on its context. For English, we saw that this property applies to the implications triggered by the additive particle *too* and the 3rd person pronouns *s/he* (with respect to the implication that there is a salient referent). Because strong con-

textual felicity is dependent on the discourse contexts, all of the projective triggers were situated in a context that was as natural as possible given the limitations of the non-spontaneous elicitation environment. The consultants were provided with a context that was neutral with respect to the implication of interest (*m*-neutral). Each of the contexts was followed by an utterance containing the target trigger, and consultants were asked to determine if the utterance was acceptable in the *m*-neutral context. If the consultants judged the utterance to be unacceptable in the *m*-neutral context, it was situated in a minimally different *m*-positive context. Consultants were then asked to make an acceptability judgment on the minimally different context/utterance pair. Acceptability judgments were generally phrased by the consultants as *good/bad*, *okay/weird*, *makes sense/doesn't make sense*, where *good*, *okay* and *makes sense* correlate with acceptable judgments and *bad*, *weird* and *doesn't make sense* correlate with unacceptable judgments, where # indicates that a sentence was judged as unacceptable in contrast to the '*' for the standard notation for ungrammaticality. This distinction is especially important for setting up tests for semantic and pragmatic phenomena because the judgments should be based on situating a grammatical sentence in a specific context. Thus, the first step in any project focusing on semantic and pragmatic intuitions is ensuring that the target utterances are grammatical constructions. Take, for example, (115a) and (115b). In (115a), the particle *chik* while the particle *yän* is used in (115b). Both particles are commonly translated as 'already' (note that there is a wider range of uses for *chik*, which will be discussed in Ch. 6). However, the particle *yän* turns out to be ungrammatical when used with non-verbal predicates as shown in (115b).

- (115) a. *Ma Juan k'o chik wawe*'.
 CL Juan EXST PAR here
 'Juan is already here.'
- b. **Ma Juan k'o yän wawe*'.
 CL Juan EXST PAR here
 Intended: 'Juan is already here.'

Though both particles *yän* and *chik* give rise to similar potentially projective implications, (115b) is not a suitable candidate for testing for projective content, while

(115a) can be used since it is judged to be acceptable by consultants.

Only once the utterances containing the triggers were judged for acceptability in isolation of a context with consistent judgments always tested with a minimum of two speakers, did I ask for acceptability judgments based on the *m*-neutral and *m*-positive contexts. The starting point was always the *m*-neutral context. The expectations for the strong contextual felicity diagnostic is that when the target utterance is situated in a neutral context with respect to the projective implication, triggers that impose strong contextual felicity will be judged as unacceptable. If the utterance is judged as acceptable in an *m*-neutral context, then the implication places no requirement on the context. For those utterances judged to be unacceptable in neutral contexts, the utterance was then situated in a minimally different *m*-positive context. If the utterance is then judged to be acceptable in the positive context but not in the neutral context, it provides evidence that the trigger imposes strong contextual felicity.

Starting with *chuq'a* 'too/also' as an example, the relevant implication tested in (116) is that there is a salient alternative. The target utterance in (116) containing *chuq'a* triggers the implication that there is a salient person within the discourse context who is also eating candy. However, the context is neutral with respect to this implication, and only someone who is eating fruit is mentioned.

(116) Context: You get on the bus and sit down next to a woman you've never met before and begin eating a snack, which is a cup of fruit. The woman says to you:

#*w-al tajin nk-i-täj kab' chuq'a*
A1S-child PROG IMPF-B3S-eat sweet too

My child is eating candy, too.

Unless one has a very loose definition of fruit as candy, there is no available alternative in the given context. The utterance is judged to be unacceptable in the neutral context, which is suggestive that *chuq'a* is imposing strong contextual felicity. To confirm that the unacceptable judgment is due to the *m*-neutral context, the utterance is situated in an *m*-positive context. By minimally changing the context in

(117), where it is established that there is someone else eating candy, the utterance is now judged to be acceptable.

(117) [Context: Same as (116), but you are eating candy as a snack.]

w-al tajin nk-i-täj kab' chuq'a
 A1S-child PROG IMPF-B3S-eat sweet too

‘My child is eating candy, too.’

Because of the minimal pair in (116), where the utterance cannot be used in an *m*-neutral context but can be used in (117) with an *m*-positive context, I can reasonably conclude that *chuq'a* imposes strong contextual felicity.

Recall that the third singular pronoun in Kaqchikel triggers two different implications: (i) the referent must be human, and (ii) there is a salient referent established in the context. To tease apart any differences in the properties of each implication, the context should control for each implication separately. First, for the implication that the referent must be human, a salient referent must be established in the context without specifying whether or not the referent is human. If the sentence containing the trigger *riya'* is acceptable in a context that is neutral with respect to the human referent implication, then this particular implication does not require strong contextual felicity. The example in (118), which is adapted from Tonhauser et al. (2013), provides a salient referent in the context as a possible anaphor to the pronoun *riya'*, but the referent is underspecified as to the animacy (or humanness) of the referent.

(118) [Context: It's late at night and you're walking home with your friend, Emelia. She doesn't see very well at night, and you're walking a bit in front of her. You both see a giant mass on the corner ahead but aren't at all sure what is. You both fear it could be a vicious street dog. As you get closer and see what it is, you call back to Emelia:]

Riya' jun achin. Ma t-a-xij tä aw-i'
 3S one man NEG IMP-A3S-be.afraid IRR A2S-REF

‘It's a man. Don't be afraid!’ (Lit. ‘He's a man’)

The sentence is acceptable in a context that is neutral with respect to the human referent implication, which leads to the conclusion that *riya'* does not impose constraints on its context with respect to this implication.

After isolating the implication *n* that there is a human referent, we can test for strong contextual felicity of the implication *m* that there is a salient referent established in the context by situating *riya'* in an *m*-neutral but *n*-positive context. In (119), the context provides the information that the presentation is about the speaker's family, but is neutral with respect to a suitable salient referent.

(119) [Context: You are giving a presentation about your family in class. You begin the presentation by saying:]

#Riya' jun tijonel.
3S one teacher

'S/he is a teacher.'

The utterance is judged as unacceptable consistently with consultants in the *m*-neutral context. By minimally changing the context, where the speaker provides a referent in the first sentence, the utterance *riya' un tijonel* is now judged to be acceptable in (120).

(120) [Context: Same as (119):]

Ru-b'i nu-te' yari' Teresa. Riya' jun tijonel
A3S-name A1S-mother COP Teresa 3S one teacher

'My mother's name is Teresa. She is a teacher.'

The acceptability of (120) but not in (119) leads me to conclude that the salient referent implication of *riya'* imposes constraints on the context, but the example in (118) shows that the human referent implication does not.

For demonstrative determiners, the potentially projective implication that arises is that there is a suitable referent indicated. Taking the demonstrative determiner *le* (a variant of *la*), which is used to refer to items within sight of the speech act participants but not very near to the speakers. Consider first the context in (121),

where the speaker only says *le j-achi* ‘that man’ without pointing or gesturing toward a referent. In this context, the utterance is judged to be unacceptable.

(121) [Context: Rigo is speaking with his cousin, Jeremias while walking the the park. Jeremias stops walking and says to Rigo:]

#*Le j-achi k'o chi=la' x-ø-u-kamisaj a-tat*
 D one-man EXST PRE=D.DEM PRFV-B3S-A3S-kill A2S-father

‘That man over there killed your father.’

Again, using a minimal contrast between the context in (121) and that in (122), where the only difference is that now speaker points to the referent, the utterance is now judged as acceptable with speakers.

(122) [Context: Same as (121), except this time Jeremias points to a specific man in the park:]

Le j-achi k'o chi=la' x-ø-u-kamisaj a-tat
 D one-man EXST PRE=D.DEM PRFV-B3S-A3S-kill A2S-father

‘That man over there killed your father.’

The contrast between judgments in (121) and (122) are evidence that the deictic determiners do require strong contextual felicity with respect to the implication that a suitable referent be indicated in the context.

If the patterns that emerge for both English and Guaraní in Tonhauser et al. (2013) are consistent with Kaqchikel projective implications, we might expect that there are no constraints imposed on the context for some implications, so triggers can be used in neutral contexts with respect to such implications. Starting with the expressive phrase *ri kite' tz'e'* as shown in (123), the implication of a negative attitude toward the referent is triggered. The context is neutral with respect to Maria’s negative attitude towards her boss, and in fact, refers to a positive view she typically holds of the boss. In the *m*-neutral context, all speakers judged the use of the expressive phrase to be acceptable, which supports the conclusion that the implication does not impose constraints on the context.

- (123) [Context: (adapted from Tonhauser et al. (2013)) Maria and Marta work in a small restaurant, and their boss is named Emelia. Emelia is generally a fair and kind boss. One day, she asks to speak with Maria privately. When Maria returns, she says:]

Ri ki-te' tz'e' ma x-ø-toj tä nu-q'ij
 D A3P-mother dog NEG PRFV-B3S-pay IRR A1S-day

‘That bitch (lit. mother of dogs) didn’t pay me my wage!’

Since *ri kite' tz'e'* is acceptable in an *m*-neutral context, there is no need to test it in an *m*-positive context. In fact, using the trigger in a positive context for many of the triggers that do not require strong contextual felicity results in redundancy, which is especially true for CIs and NRRCs since they often introduce new information into the discourse.

For possessive constructions like that in example (124), the implication triggered is that there is a possessive relation between the possessor and the N. In (124), *nutz'e'* ‘my dog’ implicates that there is a possessive relation between the speaker and a dog. In the context provided in (124), there is no previous mention of the possession of a dog by the speaker, but the utterance is judged to be acceptable in the neutral context.

- (124) [Context: (adapted from Tonhauser et al. (2013)) A woman is being interviewed for a job at a school to be a teacher. She suddenly interrupts the interviewer and says:]

Rujwaxik n-ø-in-tzuq nu-tz'e'
 necessary IMPF-B3S-A1S-feed A1S-dog

‘I need to feed my dog!’

Because utterance in (124) is judged to be acceptable, we can conclude that the possessive relation implication is not subject to strong contextual felicity.

Although the possessive construction such as that in (124) can be used in a neutral context for the first or second person (i.e. local participants) the non-local possessors have different constraints. Since the possessive markers discussed

here are pronominal, it should be unsurprising that the 3S possessive marker, which is also the Set A agreement marker, requires an antecedent to be provided in the context. Consider the example in (125), where the context is neutral with respect to the salient referent implication of the non-local possessor. The utterance is judged as unacceptable in the neutral context, where there are only local participants in the discourse.

- (125) [Context: Ambrocia went to her first day at a new school, where she didn't know anyone. After walking home from school, her mother asks her how her day was. Ambrocia says excitedly:]

#X- ϕ -in-tzët ru-tz'e'!
 PRFV-B3S-A1S-see A3S-dog

'I saw his/her dog!'

If a minimal change is made to the context as in (126), where a salient referent (a non-local human referent) is established in the context, the same utterance from (125) is now considered to be acceptable by speakers.

- (126) [Context: Ambrocia goes to her first day at a new school, where she meets another student, who is named Carlos. She and her new friend walk home together after school. Her mother asks her how her day was. Ambrocia says:]

X- ϕ -in-tzët ru-tz'e'!
 PRFV-B3S-A1S-see A3S-dog

'I saw his/her dog!'

Because the context in (126) is positive with respect to the salient referent implication but neutral with respect to the possessive relation implication, we have further evidence that the possessive relation does not impose strong contextual felicity but the non-local (pronominal) possessive arguments do.

For the remaining projective triggers, the same diagnostics are applied, and, given the results shown thus far, we have reasonable evidence that the diagnostics

are fairly reliable for testing for strong contextual felicity. In each of the following examples, the sentence containing the target projective implication is situated in a neutral context starting with the nominal appositive *jun estudiante chla' pa UT* in (127), where the context is neutral with respect to the implication of the truth of its content. In (128) and (129), the polar implications of *yamer* and *j(u)b'a' ma* are tested. And finally, the exclusive particle(s) *xa xe/xu* are tested in (130). For each of the projective triggers, the examples given here were judged to be acceptable in neutral contexts, which means that they also do not impose strong contextual felicity.

- (127) [Context: You're new to town, and your neighbor, Raul, invites you to a party. After arriving, he introduces you to a person named Sara. After the brief introduction, Sara goes to get a drink. Raul turns to you and says:]

Ya Sara jun estudiante ch=la' pa UT n-ø-pe nojel juna'
 CL Sara one student PRE=D PRE UT IMPF-B3S-come every year
wawe' pa Solol.
 here PRE Sololá

'Sara, a student from UT, comes here to Sololá every year.'

- (128) [Context: Gloria comes home from work and asks her husband how his day was. He exclaims:]

Yin yamer x-i-r-pitz ka jun j-ch'ich'!
 1S almost PRFV-B1S-A3S-squish PAR one one-car

'I was almost hit by a car!' (Lit. 'I was almost squished by a car.')

- (129) [Context: Same as (128):]

J-b'a' ma x-i-r-pitz ka jun j-ch'ich' pa b'ey!
 ONE-little.bit NEG PRFV-B1S-A3S-squish PAR one one-car PRE street

'I was almost hit by a car in the street!'

(130) [Context: Gloria returns from a short trip to the city for one week. She hasn't spoken to her husband since she left. After she gets home, she asks how he and their daughters are doing. He blurts out:]

Xa xu ya Marta n- ϕ -samaj kowan!
 PAR PAR CL Marta IMPF-B3S-work a.lot

'Only Marta works a lot!'

The primary reason to start with the diagnostics for strong contextual felicity is to know which projective triggers require positive (entailing) contexts when testing for projection and obligatory local effect. In the next section, I turn to the diagnostics for projection, which crucially rely on the results from the strong contextual felicity tests to ensure that the triggers *chuq'a*, *riya'*, demonstrative determiners and non-local pronominal possessive constructions are all situated in positive contexts. Table 4.1 summarizes the results for the strong contextual felicity diagnostic for Kaqchikel triggers.

Trigger / implication with SCF	Trigger / implication without SCF
<i>chuq'a</i> / salient alternative Dem + N / suitable referent <i>riya'</i> / salient referent	Possessive + NP / possessive relation <i>riya'</i> / human referent Factives / content of the complement <i>xa xe</i> / prejaçant implication Aspectual verbs / prestate holds <i>jub'a ma</i> / polar implication <i>yamer</i> / polar implication NRRCs/nominal appositives / truth of the content Expressives / attitude toward referent

Table 4.1: Strong Contextual Felicity for Kaqchikel Triggers

4.2 Projection

Recall that the standard diagnostic for projection is the Family-of-Sentences test. In § 3.2.1, I outlined the potential embedding constructions, which target entailments

and assertions but not projective implications. Before demonstrating how to implement the Family-of-Sentences in Kaqchikel, I should mention that there are gaps in the data I present here due to a few factors. First, not all tests are suitable for all triggers, so the results presented in this section applied at minimum two embeddings for each trigger and confirmed by at least two consultants. Second, setting up the tests and ensuring that the constructions are both grammatical and representative of natural speech (i.e. not simply a word-for-word Spanish to Kaqchikel or English to Kaqchikel translation) takes a significant amount of time and time in the field is always limited. This means that there are cases where only one consultant provided judgments, or, in the case of obligatory local effect, setting up the diagnostic appropriately was not achieved so there is no data to present. However, the results provided here do give evidence that the implications discussed are projective in Kaqchikel, and they provide a strong base for collecting additional data for future studies.

Starting with the projective trigger *chuq'a*, which we saw in § 4.1 requires strong contextual felicity, we know that the context must be *m*-positive with respect to the salient alternative implication *m*. To confirm that this is the case, the example in (131), where the context is *m*-neutral and no salient alternative is established. The base sentence is given in (132a), which is then embedded in the antecedent of a conditional in (132b) and realized as a question in (132c). Note that they are all judged to be unacceptable in the neutral context with one exception. One consultant wanted to accommodate the presupposition by saying that perhaps the speaker is unaware of what everyone is actually drinking so perhaps Emelia and someone else is really drinking coffee. However, even in the explanation of the added context, the consultant provided a salient referent to her hypothetical situation, which still supports the claim that *chuq'a* requires a salient referent to be acceptable.

(131) [Context: Imagine you have just joined several of your friends in a café.
Everyone is drinking tea, so you decide to also order tea:]

- a. #*Emelia chuq'a tajin n-ø-u-tej café.*
Emelia also PROG IMPF-B3S-A3S-eat coffee
'Emelia is also drinking coffee.'

- b. #*Xa tä ya Emelia chuq'a tajin n- ϕ -u-tej café, ri kab'*
 PAR IRR CL Emelia also PROG IMPF-B3S-A3S-eat coffee D sugar
k'o r-uk'in riya.
 EXST A3S-RN.with 3S
 'If Emelia is also drinking coffee, then she has the sugar.'
- c. #*Emelia chuq'a tajin n- ϕ -tej café?*
 Emelia also PROG IMPF-B3S-A3S-eat coffee
 'Is Emelia also drinking coffee?'

Taking each of the sentences in (131) and situating them in a minimally different *m*-positive context where there is an alternative provided, the acceptability judgments for *chuq'a* were consistent across consultants. Further, the consultant who found (131) to be somewhat acceptable with the neutral context found the context in (132) to be significantly better than (131).

(132) [Context: Imagine you have just joined several of your friends in a café. One of your friends is drinking coffee, while others have ordered tea. You decide to order coffee. Your friend Magda then turns to you and says the following:]

- a. *Emelia chuq'a tajin n- ϕ -u-tej café.*
 Emelia also PROG IMPF-B3S-A3S-eat coffee
 'Emelia is also drinking coffee.'
- b. *Xa tä ya Emelia chuq'a tajin n- ϕ -u-tej café, ri kab'*
 PAR IRR CL Emelia also PROG IMPF-B3S-A3S-eat coffee D sugar
k'o r-uk'in riya.
 EXST A3S-RN.with 3S
 'If Emelia is drinking also coffee, then she has the sugar.'
- c. *Emelia chuq'a tajin n- ϕ -tej café?*
 Emelia also PROG IMPF-B3S-A3S-eat coffee
 'Is Emelia also drinking coffee?'

Because use of the projective trigger *chuqa* is felicitous in the *m*-positive context even when embedded in the antecedent of a conditional and when realized as a question, it shows that the implication *m* triggered by *chuq'a* is projective.

Similarly, the pronoun *riya'* has already been shown to require strong contextual felicity with respect to the salient referent implication (*m*) but not with respect to the human referent implication (*n*). In (133), the context provides human referents making it *n*--positive. Further, (133a) narrows down the referent to one individual, which the speaker indicates by pointing making it also *m*-positive as well. Using the context and the base sentence, I then asked consultants to judge whether or not (133b)-(133d) were acceptable in the given context. Because the consultants all judge (133b)-(133d) to be acceptable, I conclude that *riya'* is projective with respect to the salient referent implication in (133).

(133) [Context: (adapted from Tonhauser et al. (2013)) Marta is at the park with Emelia, and they see a group of boys getting off of the bus. Marta points to one of the guys and says:]

- a. *Le jun achi la' n- \emptyset -samaj pa jun restaurant.*
D one man D IMPF-B3S-work PRE one restaurant
‘That man there works in a restaurant.’
- b. *Riya' nu-metz'*
3S A1S-eyebrow
‘He’s my boyfriend (lit. ‘my eyebrow’).’
- c. *(La) riya' a-metz?*
(Q) 3S A2S-eyebrow
‘Is he your boyfriend?’
- d. *Xa tä riya n- \emptyset -pe chi ri' ki' nu-k'ux.*
PAR IRR 3S IMPF-B3S-come PRE D.DEM sweet A1S-heart
‘If he comes over here, I’ll be happy.’

To briefly summarize, the implication that there is a suitable alternative for *chua'a* and the implication that there is a salient referent established for *riya'* are subject to strong contextual felicity, so the contexts must be positive with respect to the implication triggered. However, we also know that there are many implications that are not subject to strong contextual felicity. Starting with the factive construction *-etamaj* ‘to learn’, which when marked with the perfect suffix is a

close equivalent to *know* (or rather ‘have learned’), the construction can be used in a neutral context.

- (134) [Context: You get on the bus and sit behind two friends, Fernando and Lucia, who you haven’t seen in quite a while. You ask them about a mutual friend, Marta, who you also haven’t seen in a while. You would like to see her, so you ask if they plan to meet with her soon. Lucia says:]

Ya Marta ru-tama-n chi k’o nimaq’ij chwaq
 CL Marta A3S-learn-PRF.TV REL EXST party tomorrow

‘Marta knows there is a party tomorrow.’

The example in (134) shows that the factive construction, which triggers the implication of the truth of the content of the complement *k’o nimaq’ij chwaq* ‘there is a party tomorrow’, is acceptable in a neutral context, so we can also test for projection in a neutral context. In (135b), the sentence containing the factive predicate is realized as a question, and then as a conditional in (135c).

- (135) [Context: You get on the bus and see two friends, Fernando and Lucia. You sit in the seat behind them and overhear the following conversation:]

a. *Ya Marta ru-tama-n chi k’o nimaq’ij chwaq*
 CL Marta A3S-learn-PRF.TV REL EXST party tomorrow

‘Marta knows there is a party tomorrow.’

⇒ There is a party tomorrow.

b. *Ru-tama-n ya Marta chi k’o nimaq’ij chwaq?*
 A3S-learn-PRF.TV CL Marta REL EXST party tomorrow

‘Does Marta know that there is a party tomorrow?’

⇒ There is a party tomorrow.

c. *Xa tä Jeremias ru-tama-n chi k’o nimaq’ij chwaq,*
 PAR IRR Jeremias A3S-learn-PRF.TV REL EXST party tomorrow

ja ki’ ru-k’ux.

FOC sweet A3S-heart

‘If (only) Jeremias knows there is a party tomorrow, then he’s happy.’

⇒ There is a party tomorrow.

For this particular example, I used an implication judgment task. After the consultants heard both the context and the embedded implications, I then asked them: Based on this conversation, how likely it is that there is, in fact, a party tomorrow? The consultants all said either that there was definitely a party or very likely, which suggests that the factive implication projects out of the scope of the question and the conditional making it projective.

Since asking judgments based on likelihood that there is a party is not necessarily the most reliable way of targeting an implication judgment, I contrasted (135) with a non-factive verb *-qu* ‘think’. I again asked the consultants: Based on this conversation, how likely it is that there is, in fact, a party tomorrow? Interestingly, the speakers consistently responded with uncertainty with respect to whether or not there is a party tomorrow. Responses included ‘you can’t tell’, ‘maybe there is and maybe there isn’t’, and ‘I don’t know’. However, for the factive constructions, the intuition was much stronger that there was a party planned for tomorrow, which suggests that the *there is a party tomorrow* implication is not triggered by this construction.

(136) [Context: The same as (135).]

- a. *a Marta n-u-qu chĩ k’o nimaq’ij chwaq*
 CL Marta IMPF-B3S-think REL EXST party tomorrow
 ‘Marta thinks there is a party tomorrow.
 ⇨ There is a party tomorrow.
- b. *Ya Marta n-u-qu chĩ k’o nimaq’ij chwaq?*
 CL Marta IMPF-B3S-think REL EXST party tomorrow
 ‘Does Marta think that there is a party tomorrow?
 ⇨ There is a party tomorrow.

In addition to *-etaman*, *-na(b)’ej*¹ ‘find out’ also triggers a factive implication. Embedding a sentence containing *-na(b)’ej* does not affect the truth of the content of the complement, which is shown by the examples in (137). In (137b),

¹The *b* is in parentheses here because speakers commonly reduce the bilabial implosive *b*’ to just a glottal stop in natural speech.

the base sentence is realized as a question, and in (137c) it is embedded under negation. In both cases, speakers again said that they would believe there is definitely a party tomorrow upon hearing the conversation in (137).

(137) [Context: Same as (135).]

- a. *Ambrocia x-u-nab'ej chï k'o nimaq'ij chwaq*
 Ambrocia PRFV-B3S-find.out REL EXST party tomorrow
 'Ambrocia found out that there is a party tomorrow.
- b. *(La) Ambrocia x-u-nab'ej chï k'o nimaq'ij chwaq?*
 Q Ambrocia PRFV-B3S-find.out REL EXST party tomorrow
 'Did Ambrocia find out that there is a party tomorrow?'
- c. *Ambrocia man x-u-nab'ej tä chï k'o nimaq'ij chwaq.*
 Ambrocia NEG PRFV-B3S-find.out IRR REL EXST party tomorrow
 'Ambrocia didn't find out that there is a party tomorrow.'
 ⇒ There is a party tomorrow.

Just as with the factive constructions, expressive phrases, such as *ri kite' tz'e'*, are acceptable in neutral contexts and strong contextual felicity is not a factor when setting up the diagnostic for projection.

In (138), the consultants were asked to consider the context to determine if Roberto's boss should be invited to his birthday dinner or not. Again, turning to an implication judgment task by asking an indirect question related to the implication of a negative attitude toward the referent, responses provide information about the projectivity of the negative attitude implication. The expectation for a projective implication is that consultants will respond 'no' that the boss should not be invited. If the implication does not project, then consultants will respond 'yes'.

(138) [Context: You are trying to create a list of people to invite to Roberto’s birthday dinner. Obviously, you only want to invite people that Roberto’s likes and wants to there. You ask him if you should invite his boss, who he normally says fond things about. He says:]

- a. *Ri ki-te’ tz’e’ ma x-ø-toj tä nu-q’ij.*
 D B3P-mother dog NEG PRFV-B3S-pay IRR A1S-day
 ‘That bitch (lit. mother of dogs) didn’t pay me my wage!’
- b. *Taj manä ri ki-te’ tz’e’ ma x-ø-toj tä nu-q’ij.*
 IRR NEG D B3P-mother dog NEG PRFV-B3S-pay IRR A1S-day
 ‘It’s possible that bitch didn’t pay me my wage!’
- c. *Ri ki-te’ tz’e’ ma x-ø-toj tä nu-q’ij?*
 D B3P-mother dog NEG PRFV-B3S-pay IRR A1S-day
 ‘Did that bitch pay me my wage?’

Given the context and sentences that followed in (138), consultants all responded with ‘no’ and agreed that Roberto’s boss should not be invited because Roberto is not fond of him, so he would not be comfortable with him attending the birthday dinner. Given the consistent response of ‘no’, I conclude that the implication triggered by the expressive phrase *ri kite’ tz’e’* is projective.

The examples of the diagnostics for Kaqchikel implemented in this section show that the operators used for the Family-of-Sentences do not target the implications listed in Table 3.1, which supports the idea that projective meaning and the types of expressions that trigger it are strikingly similar across languages, but an even larger sample of languages studied for projective meaning is necessary. Further, the study up to this point focuses primarily on the constructions similar to the English projective triggers without considering what other novel constructions may also be present in a given language.

4.3 Obligatory local effect

The final set of diagnostics related to the behavior of projective implications is for obligatory local effect. Testing for obligatory local effect is one of the more chal-

lenging properties to target because it requires more complex constructions to be set up. While syntactic complexity is one factor, trying to compose a suitable context is also a challenge. The very nature of the test will result in odd sounding discourses when a trigger requires that its effect be local. However, it takes a great deal of effort to ensure that the oddness of the discourse is not due to ungrammaticality but due to obligatory local effect. Recall that obligatory local effect is the behavior of some projective implications when embedded under propositional attitude verbs. For some projective implications, the content of the implication must be within the scope of the attitude verb.

To test for obligatory local effect in Kaqchikel, the projective triggers were embedded under the verb *-qu* 'to think/believe'. The purpose of the embedding under a belief-predicate are best described in Tonhauser et al. (2013): "An utterance of a sentence containing such a belief-predicate attributes to the attitude holder the belief that the proposition denoted by the embedded clause is true, that is, part of the attitude holder's epistemic state"(Tonhauser et al., 2013, 92). With respect to projective content, if the implication is outside of the attitude holder's epistemic state and the utterance is judged to be felicitous, there is no obligatory local effect. If, however, the utterance or discourse is judge to be infelicitous, then the projective content of a given trigger does have local effect.

Starting with a relatively straightforward implementation of the test, the expressive phrase *ri kite' tz'e'* is embedded under *-qu* 'think' in (139). The negative attitude is not within the epistemic state of Roberto, which is indicated by saying that Roberto thinks the boss is nice. Rather, the negative attitude holder is the speaker and not Roberto.

- (139) [Context: You are planning a party for your friend Roberto, but you need to know who Roberto likes or would want at the party in order to invite them. You talk to his friend Juan, and you ask him if you should invite Roberto's boss. He responds:]

Roberto n-u-qu chi ri ki-te' tz'e' üt ru-na(b)'oj.
 Roberto IMPF-A3S-think REL D A3P-mother dog good A3S-personality

'Roberto thinks that bitch is nice.'

Since the content of the projective implication is not within Roberto's epistemic state and the utterance in (139) is judged as acceptable by consultants, the expressive phrase *ri kite' tz'e'* does not have obligatory local effect here.

The example in (140) contains a possessive construction *rutz'e' Rigo* 'Rigo's dog', which triggers the implication that there is a possessive relation. To construct the diagnostic for obligatory local effect for the possessive, the context states that Marta does not know who the owner of the dog is. The utterance containing the possessive phrase is then embedded under *-qu*, where Marta is the belief-holder.

- (140) [Context: (adapted from Tonhauser et al. (2013)) Emelia and Marta are walking through the park when they see a dog. Marta is scared of the dog and thinks it is mean. Emelia knows that the dog is Rigo's, but Marta does not. When Emelia gets home, she tells her husband:]

Marta n-u-qu chi ru-tz'e' Rigo yari jun itzël tz'e'
 Marta IMPF-A3S-think REL A3S-dog Rigo COP one ugly/evil dog

'Marta thinks that Rigo's dog is mean.'

For (140), consultants found the discourse to be acceptable in spite of the fact that the content of the possessive implication is not within the scope of Marta's belief-state, which leads to the conclusion that the possessive construction does not require that its effect is local here.

Thus far, only triggers without strong contextual felicity have been tested. For triggers that do impose strong contextual felicity, the referent or alternative must be within the belief-holder's epistemic state. In example (141), the sentence

containing *chuq'a* is embedded under *-qu*. In the overall discourse, an alternative for an additional person drinking coffee is supplied. However, the alternative is not known to Magda.

- (141) #*Juan tajin n-u-tej café, per Magda ma ru-tama-n*
 Juan PROG IMPF-B3S-eat coffee but(sp) Magda NEG A1S-know-PRF
tä. Magda n-u-qu chi' Emelia chuq'a tajin n-u-tej
 IRR. Magda IMPF-B3S-think REL Emelia too PROG IMPF-B3S-eat
café
 coffee
 'Juan is drinking coffee, but Magda doesn't know that. Magda thinks that Emelia is drinking coffee, too.'

Speakers consistently judged the contents of (141) to be unacceptable and generally commented that it sounded very strange and made no sense. Because a salient alternative is established in the context, the infelicity cannot be due to not satisfying the strong contextual felicity constraint. Note that by changing the discourse to eliminate the fact that Magda is unaware that someone else is drinking coffee results in a discourse judged to be acceptable, which is shown in (142)

- (142) *Juan tajin n-u-tej café. Magda n-u-qu chi' Emelia*
 Juan PROG IMPF-B3S-eat coffee. Magda IMPF-B3S-think REL Emelia
chuq'a tajin n-u-tej café
 too PROG IMPF-B3S-eat coffee
 'Juan is drinking coffee. Magda thinks that Emelia is drinking coffee, too.'

The contrast between (141) and (142) indicate that the unacceptability judgments for (141) are due to obligatory local effect for the trigger *chuq'a*.

The salient referent implication of the pronoun *riya'* has also been shown to require strong contextual felicity. In order to test for obligatory local effect, a salient referent must be supplied in the context but not be within the belief-state of the attitude holder. In (143), the context preceding the target sentence containing the pronoun *riya'* is used to establish that Marco is unaware of the referent. The first sentence of the utterance following the context supplies a salient referent, and the second sentence contains the embedded content.

(143) [Context: Pedro, Marco, and Juan are visiting Xela for the first time, and they get lost trying to find their way back to their hotel. Pedro and Juan are walking much faster than Marco, so they wind up far ahead of him. Pedro and Juan turn a corner before Marco, and Pedro says to Juan:]

#K'o jun achi ch=la'. Marco n-u-q'u chi riya jun eleq'on
 EXST one man PRE=D.DEM Marco IMPF-A3S-think REL 3S one thief

'There's a man over there. Marco thinks he is a thief.'

The utterance in (143) was judged to be unacceptable in the given context, which means that the salient referent implication has obligatory local effect.

The final example of testing for obligatory local effect is given in (144) for the factive construction *-etaman*.

(144) *#Magda n-u-qu chi Jeremias ru-tama-n chi k'o*
 Magda IMPF-A3S-think REL Jeremias A3S-know-PRF REL EXST
nimaq'ij chwaq, per Magda ma n-u-qu tä chi k'o nimaq'ij
 party tomorrow but Magda NEG A3S-think IRR REL EXST party
chwaq.

tomorrow.

'Magda thinks that Jeremias knows that there is a party tomorrow, but Madga doesn't think that there is a party tomorrow.'

Consultants consistently judged (144) to be unacceptable and contradictory with respect to Magda's beliefs about the party, which suggests that the factive predicate *-etaman* requires local effect here.

Taking stock of the triggers that do require obligatory local effect and those that do not, a summary of the results are provided in Table 4.2.

4.4 Interim summary

The discussion up to this point in the chapter has focused on the various linguistic constructions that trigger implications, which are projective in Kaqchikel as well as in English. The data supports the conclusion that there is a subset of projective implications which place constraints on their context (strong contextual felicity) and

Trigger / implication with OLE	Trigger / implication without OLE
<i>chuq'a</i> / salient alternative	<i>riya'</i> (3s) / human referent
Factives / content of the complement	Dem + N / suitable referent
<i>riya'</i> (3s) / suitable referent	NRRCs/nominal appositives / truth of the content
Aspectual verbs / prestate holds	Expressives / attitude toward referent
<i>yamer</i> / polar implication	<i>xa xe</i> / prejacent implication
<i>jub'a ma</i> / polar implication	Possessive NP / possessive relation

Table 4.2: Obligatory Local Effect for Kaqchikel Triggers

that only some require that the implication be satisfied locally (obligatory local effect). Table 4.3 provides a summary of the results for Kaqchikel projective triggers for projection, strong contextual felicity and obligatory local effect. While the data given here offers a range of projective triggers in Kaqchikel, there are sure to be many more unexplored as of yet in the language. Further, at present there are gaps in the data with respect to the full range of projection tests as well. However, there is enough evidence here to suggest that Kaqchikel projective triggers, which have similar translations to the English projective triggers, pattern very similarly to both the English and Guaraní triggers as discussed in Tonhauser et al. (2013). The cross-linguistic similarities suggest that there are perhaps universal properties related to linguistic expressions that trigger projection.

4.5 Diagnosing (not-)at-issueness

The diagnostics up to this point have focused on conventionalized meaning, and the patterns of behavior when certain expressions are embedded. However, the question as to what type of information is generally encoded using projective triggers is left open. In general, if we assume that a sentence is uttered (or written) with the intention of conveying information, there are (at least) two types of content through which the information is communicated: at-issue content and not-at-issue content. At-issue content, loosely defined, is what the sentence is about. Content introduced by projective triggers is generally considered not-at-issue content. That is, projective meaning is not the main point of an utterance, and it tends to be backgrounded information.

Trigger / implication	SCF	OLE	Projective
<i>chuq'a</i> / salient alternative	✓	✓	✓
Dem + N / suitable referent	✓	✓	✓
Possessive + NP / possessive relation	-	-	✓
<i>riya'</i> (3s) / human referent	-	-	✓
<i>riya'</i> (3s) / salient referent	✓	✓	✓
Factives / content of the complement	-	✓	✓
<i>xa xe</i> / prejacent implication	-	✓	✓
Aspectual verbs / prestate holds	-	✓	✓
<i>jub'a ma</i> / polar implication	-	✓	✓
<i>yamer</i> / polar implication	-	✓	✓
NRRC/Nominal appositive / truth of content	-	-	✓
Expressives / attitude toward referent	-	-	✓

Table 4.3: Summary of results for projection, SCF, and OLE

At-issueness can be understood using the notion of the *question under discussion* (QUD) as introduced in the pragmatic framework of Roberts (1996). Under this approach to the organization of discourse, the QUD is determined by pragmatic principles and speaker intentions. The QUD can either be an explicit or implicit question, which is determined by the speaker and by the discourse context. Because any given discourse can address more than one topic, QUDs are organized hierarchically in a *QUD stack*, where the main question is at the top of the stack. Under this view, the goal of the discourse is to get an answer that either completely or partially addresses either the main question at the top of the stack or one of the sub-questions lower in the stack. Consider the example in (145).

(145) It was Tammi who finished the coffee and didn't make more.

When a speaker utters the content of (145), hearers will assume the intent of the utterance is to cast blame on Tammi for being the inconsiderate one who finished up the coffee without making more for everyone else. The main point of the utterance is not to assert that the coffee has been finished. Rather, this is the backgrounded information, which is a projective implication triggered by the *it*-cleft. How do

we know, exactly, that this is the intended organization of the discourse? At a glance, one could suggest that perhaps implications in general are unavailable to supply answers to a QUD. However, consider the discourse in (146). The QUD is established explicitly by the question in (146a), and the response is given in (146b). The question is seeking information about who finished the coffee.

- (146) a. Who was it that finished the coffee without making more?
b. I just saw Tammi walk toward her desk with her mug in hand.

The answer in (146b) does not provide a direct answer to the QUD. However, appealing to Grice's Maxims of conversation, namely the Maxim of Relevance, cooperative speakers will respond with information that is only relevant to the QUD. In this case, the implicature is that Tammi had coffee in her mug and is the guilty party, which means that response contextually entails an answer to the QUD.

Eliminating the possibility that implications more broadly are just unavailable to address the QUD, we have to consider that only certain types of implications tend to be not-at-issue. The example in (147) takes both the asserted content from (145) and the projective existence implication triggered by the *it*-cleft as answers to the explicit question. The possible response given in (147a) contains the content of the existence implication introduced by the *it*-cleft, while (147b) answers the question with the non-projective content from the same utterance.

- (147) Who was it that finished the coffee without making more?
a. #Someone finished the coffee.
b. Tammi finished the coffee.

The response in (147a) is an odd response and considered to be an unacceptable answer to the QUD, so the projective implication is not-at-issue in (147a). Only the answer in (147b) is an acceptable response to the question, which suggests that it is at-issue with respect to the QUD.

While there are varying perspectives on determining and understanding at-issue content, I adopt the definition provided by Simons et al. (2010) as given in (148).

(148) *Definition of at-issueness* (Simons et al., 2010, p.323)

- a. A proposition p is at-issue iff the speaker intends to address the QUD via $?p$.
- b. An intention to address the QUD via $?p$ is felicitous only if:
 - i $?p$ is relevant to the QUD, and
 - ii the speaker can reasonably expect the addressee to recognize this intention.

While the Family-of-Sentences test reliably diagnoses the property of projection, determining whether or not a proposition or implication is at-issue requires an alternative set of tests. We saw that one way to target at-issue content is using an explicit question with responses that are judged as either acceptable answers or unacceptable answers to the QUD. Additional properties associated with at-issueness are given in (149) as discussed in Tonhauser (2012):

(149) *Properties of at-issue content*

- a. At-issue content can be directly assented or dissented with.
- b. At-issue content addresses the QUD.
- c. At-issue content determines the relevant set of alternatives.

The property in (149b) was already exemplified in (147). The response in (147a) seems to miss the intent of the question being asked and does not serve even as a partial answer to the question. I now turn to the properties in (149a) and (149c).

At-issue content is observed to be the content of the utterance that can be either accepted (assented) or rejected (dissented) directly (Tonhauser, 2012). In example (150) containing a nominal appositive, the speaker utters the content of (150), and the addressee responds with the content of (150a) and (150b).

(150) Jenny, a linguist, got a job at Google.

- a. Yes, that's true.
- b. No, that's not true.

The assenting and dissenting responses in (150) are interacting with the asserted content, that Jenny got a job at Google, but not with the content of the nominal appositive, that Jenny is a linguist. The observation that only at-issue content can be assented or dissented with directly is the basis for the set of diagnostics discussed in more detail in § 4.5.1.

The final property of at-issue content listed in (149) appeals to the notion of answers to questions being a part of a set of possible alternatives, where a given question can be felicitously answered by a member of that alternative set. If an answer is not a member of the relevant set of alternatives, it is expected that it cannot serve as a suitable answer to a given question. Using the sentence in (150) but realized as a question, the speaker utters the contents of (151), and some possible responses are given in (151a) and in (151b).

(151) Did Jenny, a linguist, get a job at Google?

- a. Yes, she got a job at Google.
- b. #Yes, she is a linguist.

The response in (151b) contains the content of the nominal appositive that Jenny is a linguist and is judged to be an unacceptable response to (151), while the response in (151a) is judged to be an acceptable response. Only the content of (151a) is part of the suitable set of alternatives, and is thus considered to be at-issue content. Diagnostics for targeting this property of at-issue content are given in § 4.5.3.

4.5.1 Diagnostic for assenting or dissenting with content

The first set of diagnostics target the property of at-issue content that only at-issue content can be directly assented or dissented with. I use the diagnostics described in Tonhauser (2012) as the basis for forming the tests for Kaqchikel, so I provide the details for each diagnostic from Tonhauser (2012) and adjust them as necessary for the Kaqchikel tests.

The first diagnostic, Tonhauser's (2012) Diagnostic #1a, requires the consultants be provided with a short discourse where the first utterance contains both

in which addressee B responds to A's utterance with a simple assent (dissent) utterance followed by an utterance that conveys (the negation of) the hypothesized at-issue content, or where B responds with a simple assent (dissent) utterance followed by an utterance that conveys (the negation of) a hypothesized not-at-issue content. Ask the consultant about the acceptability of B's responses.

To exemplify Diagnostic #1b, we return to the example from (153) with the NRRC. The proposed at-issue content is that Mary wants to go to the ballet and the not-at-issue content is that she is a dancer. The dissenting response in (155a) is followed by the continuation containing the content of the asserted content while (155b) is followed by the content from the NRRC.

- (155) Mary, who is a dancer, wants to go to the ballet with us.
- a. No, Mary doesn't want to go.
 - b. # No, Mary isn't a dancer.

Only the response in (155a) with the non-projective content is felicitous, which means that the content of the NRRC is not-at-issue but the content in (155a) is.

The final sub-diagnostic using the assent/dissent tasks is similar to Diagnostic #1b except that for Diagnostic #1c, the continuation is adversative. The expectation for this diagnostic is that when the content of the continuation is the at-issue content, it will be contradictory but not when the content is not-at-issue. The full diagnostic is given in (156).

- (156) *Diagnostic #1c* (Tonhauser, 2012, p. 245)
- Create a discourse in which interlocutor A utters the target utterance and addressee B responds to A with a simple assent utterance followed by an adversative utterance that conveys the negation of either the hypothesized at-issue content or of a hypothesized not-at-issue content, or where B responds with a simple dissent utterance followed by an adversative utterance that conveys either the hypothesized at-issue content or the same hypothesized not-at-issue content. Ask the consultant about the acceptability of B's responses.

An example of Diagnostic #1c is given in (157). Again, using the utterance containing the NRRC *who is a dancer* from (153), the hypothesized at-issue content forms the continuation of the adversative response in (157a) while the content of the projective content forms the adversative continuation in (157b).

- (157) Mary, who is a dancer, wants to go to the ballet with us.
- a. Yes, but Mary isn't a dancer.
 - b. #Yes, but she doesn't want to go.

The diagnostic can also use dissenting responses with continuations of the at-issue or not-at-issue content. The expectation is that only the dissenting response with the not-at-issue content will be felicitous.

- (158) a. No, but Mary is a dancer.
- b. #No, but she doesn't want to go.

In both (157) and (158), only the continuations with the not-at-issue content are considered felicitous. This is due to the fact that only the at-issue content is available for the speaker to assent to, which is supported by the acceptable responses in (157a) and (158a).

Other implementations based on similar observations are also discussed in Onea and Beaver (2011) for Hungarian, Xue and Onea (2011) for German, Destruel (2013) for French, and finally Destruel et al. (2015) for Hungarian, German, French and English. Each of the above studies uses an experimental methodology in which speakers are asked to make the same acceptability judgments as in one-on-one elicitations. An example of the design is given in (159). Each of the continuations contains the content of the NRRC.

- (159) Mary, who is a dancer, wants to go to the ballet with us.
- a. Yes, and Mary isn't a dancer.
 - b. Yes, but Mary isn't a dancer.
 - c. No, Mary isn't a dancer.

The intuition for (159) is that the best possible response will be (170a) because it assents with the at-issue content but denies the content of the NRRC. However, the response in (159a) is expected to be less acceptable without *but* to set up the continuation as a contrast to the content from (159). Finally, the response in (170c) is expected to be an unacceptable response unless the content of the NRRC is at-issue.

4.5.2 Diagnostics for addressing the QUD

The next diagnostic, Diagnostic #2, targets the property that only at-issue content addresses the QUD. The explanation behind the diagnostic is that “...answering a question $?x.m$ (where the vector $x.m$ is of length of zero with polar questions) with an answer whose at-issue content entails $\exists x.m(x)$ is acceptable while answering $?x.m$ with an answer where only the not-at-issue content entails $\exists x.m(x)$ is not” (Tonhauser, 2012, p. 248).

(160) *Diagnostic #2:* (Tonhauser, 2012, p. 246)

Create a discourse in which speaker A utters a question with meaning $?x.m$ and an addressee B utters answers that convey $\exists x.m(x)$ as at-issue content and not-at-issue content, respectively. Ask the consultant about the acceptability of these answers to the question.

To summarize the diagnostic, you form question/answer pairs, where the question ($?x.m$) is followed by two responses. The first response provides an answer to the question with the non-projective content addressing the question directly, but the second answers situates the answer to the question in a construction that is projective and thus hypothesized to be the part of an utterance where not-at-issue content appears.

(161) Who made the raspberry cheesecake?

- a. Dan, who went to culinary school, made the cheesecake.
- b. #Dan, who made the cheesecake, went to culinary school.

When the answer to the question about who made the cheesecake is the content of the NRRC as in (161b), it does not serve as an answer to the QUD. However, when the suitable answer is not the content of the NRRC, as in (161a), it addresses the QUD and is an acceptable answer, which is evidence that supports the claim that the content of the NRRC is not-at-issue but the other content is at-issue.

4.5.3 Diagnostics for establishing relevant alternatives

The final diagnostic, Diagnostic #3, targets the property of at-issue content that only at-issue content establishes the relevant set of alternatives. This diagnostic is similar to Diagnostic #2, but for Diagnostic #3 the at-issue content targeted by the test is in the question rather than in one of the responses. If a response is addressing the projective content hypothesized to be not-at-issue it is expected that it will be judged as an unsuitable answer to the question. The diagnostic is implemented in two ways, which are described in (162) and (164).

The first implementation is a polar question that is answered with either ‘yes/no’, which is followed by a positive continuation, such as *yes, he did it*. The full diagnostic is described in (162), which is followed by an example of the diagnostic in (163).

(162) *Diagnostic #3a:* (Tonhauser, 2012, p.248)

Let S be a sentence that gives rise to hypothesized at-issue content m and hypothesized not-at-issue content n . Form a polar question Q from S . Create a discourse where interlocutor A utters Q and addressee B’s positive (negative) response is followed by utterances of simple sentences that convey m or n ($\neg m$ or $\neg n$) as at-issue content. Ask the consultant about the acceptability of B’s answers.

(163) Does Nick know that Treyna is in town?

- a. Yes, he knows.
- b. # Yes, she’s in town.
- c. No, he doesn’t know.

- d. #No, she isn't in town.

Only the responses with the at-issue content in (163a) and (163c) are accepted answers to the question in (163). Because the question establishes which alternatives are suitable answers, and also because the answer with the projective implication is not a suitable answer, we have evidence that suggest that the content of (163a) is at-issue.

For the second sub-diagnostic, the implementation varies by providing responses that have an adversative continuation, such as *yes, but...* The full diagnostic is given in (164).

(164) *Diagnostic #3b:* (Tonhauser, 2012, p.249)

Let S be a sentence that gives rise to hypothesized at-issue content m and not-at-issue content n . Form a polar question Q from S . Create a discourse where interlocutor A utters Q and addressee B responds positively (negatively), followed by an adversative utterance of a simple sentence that conveys $\neg m$ or $\neg n$ (m or n) as at-issue content. Ask the consultant about acceptability of the answers.

Returning to the example in (161) again with an NRRC, the question again contains the projective trigger. The possible answer choices that follow are a positive answer followed by an adversative continuation denying the at-issue content, an answer where the denial is the content of the NRRC and the negative negative counterparts. Only the answers in (165b) and (165d) are acceptable answers to the question in (165).²

- (165) Did Dan, who went to culinary school, make the raspberry cheesecake?
- a. # Yes, but he didn't make the cheesecake.
 - b. Yes, but he didn't go to culinary school.
 - c. #No, but he did make the cheesecake.

²Although (165b) is not a suitable response in (165), recent experimental work suggests that the content of nominal appositives and NRRCs is affected by the position in the sentence, where sentence final nominal appositives and NRRCs are more at-issue than when sentence medial.

d. No, but he did go to culinary school.

The rationale behind this diagnostic is that positive/negative responses are addressing the QUD established in the original question, and the continuation is not-at-issue content and thus is not addressing the QUD.

All of the diagnostics presented in this section were attempted in the field with Kaqchikel data. In the next section, I provide evidence that the correlation between not-at-issueness and projectivity is strong in Kaqchikel.

4.6 (Not-)at-issueness in Kaqchikel

The results from Kaqchikel on projective content given in the first half of this chapter support the claim that certain implications are projective, and that there is significant overlap with respect to the types of projective contents between English, Guaraní and Kaqchikel. In this section, the results of the projection tests are the basis for the diagnostics discussed here. The goal is to determine if the connection between content that projects and content that is not-at-issue is robust in Kaqchikel. The results in this section are based off of one-on-one elicitations and the results of a questionnaire developed from those elicitations designed to get additional responses from a larger group of native speakers in order to evaluate consistency (or perhaps a lack of consistency) across speakers.

Testing for at-issueness requires a clear understanding of the implication(s) triggered by a given trigger. Recall that the three commonly observed properties of at-issue content given in (149) are that at-issue content can be assented or dissented with, addresses the QUD, and determines the relevant set of alternatives. To construct the question/answer pairs, articulating the content of the projective implications is more difficult with certain implications than others. In general, NRRCs, nominal appositives, factives, and aspectual verbs were the easiest since the projective implications are not anaphoric or abstract, such is the case with pronouns or *chuaq'a* 'too'. Further, some diagnostics are more suitable tasks for untrained linguistic consultants than others. Simple yes/no responses are less taxing and more reliable as opposed to asking consultant to state what a hypothetical speaker is re-

sponding to. I did, however, get results that target each of the properties listed for at-issue content to minimally show how diagnostics work in Kaqchikel and further to provide preliminary evidence of the connection between not-at-issueness and projection.

4.6.1 Assent and dissent tests

The assent/dissent tests are set up to target whether assenting or dissenting an utterance containing a projective trigger can only be a response to the at-issue content. Using Diagnostic #1a as a model, I constructed sentences which contained a projective implication, which was then followed by an assenting response and a dissenting response. Consultants were then asked to state what the speaker for the responses was assenting/dissenting with.

- (166) *Jeremias ru-tama-n* *chü k'o nimaq'ij chwaq.*
 Jeremias A3S-know-PRF.TV REL EXST party tomorrow
 'Jeremias knows that there is a party tomorrow,'
- | | |
|---------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| <p>a. <i>Ja, tzij.</i>
 Yes true
 'Yes, true.</p> | <p>b. <i>Ma tzij tä.</i>
 NEG true IRR
 'No, not true.</p> |
|---------------------------------------------------------------------------|------------------------------------------------------------------------------------|

There was some disagreement as to what the speaker was assenting/dissenting with in this example. This is somewhat unsurprising as it has been observed that the content of some implications more potentially at-issue than other content, which includes the content of factive predicates. The results are interesting and would be a great topic for an experimental study testing just how robust projection across various linguistic triggers (see Amaral and Cummins (2014); Destruel et al. (2015); Xue and Onea (2011) *inter alia* for experimental studies on at-issue meaning).

The responses with a different projective trigger, *chuq'a* had much more consistent responses.

- (167) *Emelia tajin n-ø-u-tij* *café.*
 Emelia PROG IMPF-B3S-A3S-eat coffee
 'Emelia is also drinking coffee.'

- | | |
|----------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| <p>a. <i>Ja, tzij.</i>
 Yes true
 ‘Yes, true.’</p> | <p>b. <i>Ma tzij tä.</i>
 NEG true IRR
 ‘No, not true.’</p> |
|----------------------------------------------------------------------------|-------------------------------------------------------------------------------------|

In this case, speakers always said that the assenting/dissenting responses were about Emelia drinking the coffee with no mention of the projective implication. This suggests that the content triggered by *chug’a* is not-at-issue.

The next example is also with a factive predicate *-nab’ej*. However, the set up was based on Diagnostic #1b, which involves assent with a positive continuation.

(168) *Ambrocia x-u-nab’ej chi’ k’o nimaq’ij chwaq*
 Ambrocia PRFV-B3S-find.out REL EXST party tomorrow
 Ambrocia found out that there is a party tomorrow.

- | | |
|-------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| <p>a. <i>Ja, Ambrocia x-u-nab’ej.</i>
 AFF Ambrocia PRFV-B3S-find.out
 ‘Yes, Ambrocia found out.’</p> | <p>b. <i>Ja, k’o nimaq’ij chwaq.</i>
 AFF EXST party tomorrow
 ‘Yes, there is a party tomorrow.’</p> |
|-------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|

When presented with the discourse in (168), speakers consistently judged the continuation in (168a) to be a natural discourse, but they judged the continuation in (168b) to be an unnatural sounding discourse. These intuitions fall in line with the observation that the content of the complement of *-nab’ej*, which has already been shown to be projective, is also not-at-issue in (168).

Turning to a different projective trigger, the utterance with a nominal appositive in (169) is followed by dissenting responses with negative continuations. The projective content, *numetz’* ‘my boyfriend’³, serves as the continuation in the dissenting utterance in (169b). The asserted content is dissented with in (169a).

³*Numetz’* literally means ‘my eyebrow’, but speakers say this is used as a term of endearment to mean ‘my boyfriend/girlfriend’

(169) *Marco, nu-metz', n-u-q'a ch-wach n-u-q'eq*
 Marco A1S-eyebrow IMPF-B3S-descend PRE-face IMPF-B3S-move
anin.
 rapidly

'Marco, my boyfriend, likes to run.'

a. *Manäq, riya' ma n-u-q'a ch-wach tä n-u-q'eq*
 No 3S NEG IMPF-B3S-descend PRE-face IRR IMPF-B3S-move
anin
 rapidly

'No, he doesn't like to run.'

b. *Manäq, ma a-metz' tä*
 No NEG A2S-eyebrow IRR

'No, he isn't your boyfriend.'

Just as with the content of the factive complement, speakers judge the dissenting continuation to be unnatural sounding. Because the content of the nominal appositive cannot be dissented with, it suggests that it is not-at-issue in (169).

Finally, the sub-diagnostic in #1c with assenting/dissenting responses followed by adversative continuations is illustrated in (170). The expectation for (170) is that the assenting responses followed by adversative continuations with the at-issue content will be judged as infelicitous or strange responses in the discourse. However, the positive/negative responses with the continuation containing the projective content are expected to be judged as acceptable responses.

(170) *Jeremias ru-tama-n chi k'o nimaq'ij chwaq.*
 Jeremias A3S-know-PRF.TV REL EXST party tomorrow

'Jeremias knows that there is a party tomorrow.'

a. *Ja, per Jeremias man ru-tama-n tä.*
 Yes but Jeremias NEG A3S-know-PRF.TV IRR

'Yes, but Jeremias doesn't know.'

b. *Ja, per ma-jun tä nimaq'ij chwaq.*
 Yes but NEG-one IRR party tomorrow

'Yes, but there isn't a party tomorrow.'

- c. *Ma tzij tä, per Jeremias ru-tama-n.*
 NEG true IRR but Jeremias A3S-know-PRF.TV
 ‘Not true, but Jeremias knows.’
- d. *Ma tzij tä, per k’o nimaq’ij chwaq.*
 NEG true IRR but EXST party tomorrow
 ‘Not true, but there is a party tomorrow.’

The responses here were again mixed. The speaker that consistently judged the factive implications as potentially at-issue for the first diagnostic also found the continuations with the at-issue content to be acceptable and commenting, for instance, that in (170a) Jeremias doesn’t know but the speaker does and is going to the party. Other speakers found the responses in (170a) and (170c) to be less acceptable, which provides some evidence that the projective implications are at least less at-issue than the expected at-issue content.

4.6.2 Addressing the QUD tests

Before discussing the Kaqchikel Diagnostic #2, I want to address the fact that due to time constraints in the field, there are gaps in the data leaving significant room for future studies and opportunities to adapt the tests. I attempted setting up the diagnostics for various other implications, but as mentioned, some implications are more challenging to test for appropriately, which again leaves room for new diagnostics. In fact, the diagnostic for addressing the QUD was set up with consultants, but I was unable to collect enough responses for confirmation of the results. However, I include the diagnostics I was able to set up with the intention of testing for this property in future work.

The diagnostic targeting whether content is at-issue or not focuses on the fact that only at-issue content addresses the QUD. For that reason, the diagnostic begins with a question (not a polar question as with Diagnostic #3). The responses are then given where the first response addresses the QUD in the non-projective content while the second response has the suitable response to the QUD within the projective implication. Note that the focus construction in (171) triggers a similar

implication as the *it*-cleft in English, where the clefted content that is expected to be at-issue and addressing the QUD.⁴

(171) *Example for setting up #2 (without consultant responses)*

Achikë x-e-tij-o' ri kab'?
 who PRFV-A3P-eat-AF D RI KAB'

'Who ate the candy?'

a. *Ye akw'al-a' x-e-tij-o' ru-chi'.*
 FOC child-PL PRFV-A3P-eat-AF A3S-RN

'It was the children who ate the candy.'

b. *Ye ri kab' x-ø-e-tij ri akw'al-a'.*
 FOC D candy PRFV-B3S-A3P-eat-AP

'It was the candy that the children ate.'

The expectation is only the response with the non-projective content addressing the QUD will be acceptable, which is evidence that it is at-issue with respect to the given QUD.

4.6.3 Establishing the relevant set of alternatives tests

The final property of at-issue content is that the at-issue content establishes the relevant set of alternatives. The question contains a factive predicate *rutaman chi ri nimaq'ij yari*⁵ *chwaq*. The responses in (172a) and (172c) are assenting/dissenting with continuations containing the non-projective content while the responses in (172b) and (172d) do contain the projective content.

⁴I did not include the focus construction with the projection tests because consultants rejected examples with *ja* focus, which is the more standardized version, but I was unable to communicate exactly what I was looking for. Only near the end of my final trip did I find examples in Guarcax González (2016) of focus in Sololá Kaqchikel, which is an additional reason why responses from consultants were difficult to get in time.

⁵I gloss this as COP 'copula' because I have been unable to find a description of the particle in any resource and consultants consistently translate it as 'be' and use it as a copula in various constructions.

- (172) (La) *Jeremias ru-tama-n chí ri nimaq'ij yari' chwaq?*
 Q Jeremias A3S-know-PRF.TV REL party COP tomorrow
 'Does Jeremias know that the party is tomorrow?'
- a. *Ja, ru-tama-n.*
 Yes A3S-know-PRF.TV
 'Yes, he knows.'
- b. *Ja, ri nimaq'ij yari' chwaq.*
 Yes D party COP tomorrow
 'Yes, the party is tomorrow.'
- c. *Ma tzij tä, ma ru-tama-n tä.*
 NEG true IRR NEG A3S-know-PRF.TV IRR
 'Not true, he doesn't know.'
- d. *Ma tzij tä, ri nimaq'ij man yari' tä chwaq.*
 NEG true IRR D party NEG COP IRR tomorrow.
 'Not true, the party isn't tomorrow.'

Again, one speaker found the responses assenting and dissenting the projective and supposed not-at-issue content to be acceptable. However, other speakers showed a strong preference for the responses in (172a) and (172c), which is suggestive that for most speakers the content of the projective implication triggered by the factive construction is not-at-issue.

The final diagnostic, #3b, also exploits the fact that only at-issue content can establish the set of relevant alternatives. In this variation of the diagnostic, The positive responses are followed with adversative continuations first with the projective content and then with the hypothesized at-issue content, and the negative responses are followed by adversative content.

(173) *Example for setting up #3b (without consultant responses)*

- (La) *Jeremias ru-tama-n chí ri nimaq'ij yari' chwaq?*
 Q Jeremias A3S-know-PRF.TV REL D party COP tomorrow
 'Does Jeremias know that the party is tomorrow?'

- a. *Ja, per ri nimaq'ij man yari' tä chwaq.*
 Yes but D party COP tomorrow
 'Yes, but the party isn't tomorrow.'
- b. *Ja, per ma ru-tama-n tä.*
 Yes but NEG A3S-know-PRF.TV IRR
 'Yes, but he doesn't know.'
- c. *Ma tzij tä, per ri nimaq'ij yari' chwaq.*
 NEG true IRR but D party COP tomorrow.
 'Not true, but the party is tomorrow.'
- d. *Ma tzij tä, per ru-tama-n*
 NEG true IRR but A3S-know-PRF.TV
 'Not true, he does know.'

4.7 Summary

The overall goals of this chapter were to illustrate how to construct and implement a wide range of diagnostics for projective content and at-issueness. The results are interesting in that they strongly mirror the results in both English and Guaraní though a great deal of work remains to be done to provide stronger conclusions based on more rigorous testing and perhaps experimental approaches. Table 4.4 provides a summary of the overall results for the tests run for Kaqchikel.

Trigger / implication	SCF?	OLE?	Projective?	NAI?
<i>chuq'a</i> / salient alternative	✓	✓	✓	✓
<i>riya'</i> / suitable referent	✓	✓	✓	✓
<i>riya'</i> / human referent	-	-	✓	✓
Dem + N / suitable referent	✓	-	✓	✓
Possessive + NP / possessive relation	-	-	✓	✓
NRRCs/nominal appositives / truth of content	-	-	✓	✓
Factives / content of the complement	-	✓	✓	✓
<i>yamer</i> / polar implication	-	✓	✓	✓
<i>jub'a ma</i> / polar implication	-	✓	✓	✓
Expressives / attitude toward referent	-	-	✓	✓
<i>xa xe</i> prejacent implication	-	-	✓	✓

Table 4.4: Summary of results for projection and NAI

Chapter 5

Temporality in Kaqchikel

The previous two chapters focused on projective meaning and the implications that cross-linguistic data contributes to the discussion of how languages encode different types of meaning. In this chapter, I turn to a different category of meaning that also contributes to the overall interpretation of an utterance: temporal reference. The goals of this chapter are twofold. First, due to a gap in the formal semantic literature on Kaqchikel, I provide a systematic account of temporal reference in Kaqchikel by arguing that grammatical tense is not encoded in Kaqchikel. Rather, temporal reference is established in the context or by temporal adverbials. Further, I address the issue that aspect and mood markers give rise to interpretational preferences, which have been mostly unaccounted for in the temporal semantics literature (see Mucha, 2013; Smith and Erbaugh, 2005; Smith et al., 2003, for a description of interpretational preferences). Ultimately, I analyze Kaqchikel as a tenseless language with interpretational preferences as implicatures that are cancellable when a salient reference time is established or when a temporal adverbial is present. First, however, I discuss the necessary background to studies of temporal reference, which, like studies on presupposition, has a rich history in the literature.

5.1 Background to studies of temporal reference

Studies of temporal reference have largely been interested the interaction between tense and aspect in languages like English. One of the earlier analyses of temporal reference, Reichenbach (1947) proposed that tense in natural language involves three distinct times, what he refers to as ‘point of event’, ‘point of reference’ and ‘point of speech’ (labeled as E, R, S respectively). According to Reichenbach,

tenses in English can be described in terms of the ordering of these three times. Table 5.1 illustrates the ordering of these three times to derive various ‘tenses’ in English (sometimes called relative tenses). A ‘ - ’ is the temporal ordering of points in time, but ‘ , ’ means the points in time are the same.

Past perfect	E - R - S
Simple past	R,E - S
Present perfect	E - S, R
Present	S,R,E
Simple future	S,R - E
Future perfect	S - E- R

Table 5.1: English tenses in Reichenbach (1947)

Since Reichenbach first proposed the idea of three points of time to analyze tense, one of the more commonly accepted updates to the system is that of Klein (1994). Klein retains the use of the three points in time, but he views the relative tenses from Reichenbach as a combination of tense and aspect. Further, he refers to these three times as TU or time of utterance, TT or topic time, and TSit or time of situation. Klein’s TT is Reichenbach’s ‘R’ and TSit is Reichenbach’s ‘E’. Under Klein, tense is the relationship between TT and TU while aspect is the relationship between TT and TSit. Table 5.2 gives the Kleinian view for English tense and aspect, where the top half of the table represent tenses and the bottom half the four aspectual distinctions.

Past tense	$TT < TU$
Present tense	$TU \subseteq TT$
Future tense	$TU < TT$
Imperfective	$TT \subseteq Tsit$
Perfective	$Tsit \subseteq TT$
Perfect	$Tsit < TT$
Prospective	$TT < Tsit$

Table 5.2: Tense and aspect for Klein (1994)

For the purposes of this study, I assume a Kleinian perspective of tense and aspect, but I simplify the terminology to a more standardly used set of labels, which are given in (174).

- (174) a. UT: utterance time
b. RT: reference time
c. ET: eventuality time

Languages that are said to be tensed languages, such as English, encode the relationship between UT and RT grammatically with tense morphology, which is illustrated in (175). In (175a), the verb *play* is marked with the morpheme *-ed*, which encodes the past tense in that the RT is prior to UT ($RT < UT$). In (175b), the auxiliary verb *be* is inflected for the present tense, and the RT is the same as UT (i.e. $RT=UT$).

- (175) a. I played basketball.
b. I am playing basketball.

Grammatical tense in English serves to establish the RT with respect to UT, but the RT time interval can be further constrained either in context or using temporal adverbials (e.g. *tomorrow*, *yesterday*, *at 8 o'clock tonight*) to a more specific time interval within the past/present/future RT. In (176a) the RT is constrained to a past RT and further to a time interval coinciding with the day prior to UT, which is established by use of *yesterday* in Speaker A's question. In 176b, the time interval introduced by *last week* constrains the basketball playing event to the time interval that coincides with the week prior to UT.

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

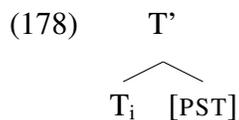
While tense is the relationship between RT and UT, aspect is the relationship between RT and ET. For example, the perfective aspect situates ET inside the time interval established by RT ($ET \subseteq RT$). However, the perfect aspect situates ET

before RT ($ET < RT$). In 177a, RT is established as a past time that occurred the day before UT as denoted by the adverbial *yesterday*, and further the event of basketball watching was completed within that RT. For (177b), the perfect construction using the auxiliary *have* marked for past tense tells us that the RT is before UT (past tense) and further the RT is the time interval at which the speaker arrives at the party. The perfect aspect marked on the main verb with the past participle *-en* tells us that ET is before RT. That is, the ‘eating’ event takes place prior to the ‘arriving’ event.

- (177) a. Yesterday, I watched the basketball game.
 b. When I arrived to the party, I had already eaten.

5.1.1 Semantics of tense

Within semantics there have been a variety of approaches aimed at formalizing the proposals described above for tense and aspect. Early approaches, like that of Prior (1967), treated tense as quantificational, where tense is a sentential operator that manipulates times and the interpretation of tense depends on existential quantification over times (see Mucha, 2015, for a summary of the quantificational analysis and some of its short-comings). However, Partee (1973) observed that tenses in English are similar to pronouns in that they can be bound, deictic and anaphoric, so tenses like pronouns should be treated as variables and not as quantifiers. Out of this observation, came the pronominal approach to tense, where tenses are treated like pronouns referring to times. The tense features, such as past or present, are akin to gender and number features of pronouns. The structure for the past tense as depicted in Cable (2013) is given in (178). As with pronouns, tense is indexed, and the features, here the past, is a sister to T.



(Cable, 2013, p.233)

Under this view, tenses are interpreted as partial identity functions which introduce presuppositions restricting the referent of the tense itself. The content interpretation of the variable in T is determined by a contextually determined assignment function (Kratzer, 1998; Matthewson, 2006b; Cable, 2013; Mucha, 2015). The lexical entry for the past tense is given in (179).

- (179) a. $\llbracket T_i \rrbracket^{g,t} = g(c)$
 b. $\llbracket PST \rrbracket^{g,t} = [\lambda t' : t' < t.t']$

(Cable, 2013, p.233)

Essentially what the entry in (179) means is at a particular evaluation time the PST denotes an identity function which is restricted to times t' that temporally precede t . If the assignment function in (179a) maps the index i to a time other than one that precedes t , T' is undefined (Matthewson, 2006b; Cable, 2013). Because tenses are considered presuppositional (and pronominal), I refer to this approach as the presuppositional approach to tense. The approach described here is pertinent to the analysis of St'át'imcets proposed by Matthewson (2006b), which relies on the notion of the tense presupposition to account for temporal restrictions in a superficially tenseless language, which is detailed in § 5.1.2.1.

An alternative approach to the presuppositional approach of the pronominal treatment of tenses, or temporal reference rather, views RT as an implicit temporal anaphor that must be resolved for the sentence to be assigned meaning (Partee, 1984; Kamp and Reyle, 1993; Bittner, 2005, 2014; Bohnemeyer, 2009). The anaphor can be resolved by tense, but it need not be. Under this view, languages lacking overt tense morphology can be accounted for as resolving the temporal anaphor in ways other than relying on tense to do the work. For example, the anaphor can be an argument of the predicate (Bittner, 2014) or can be introduced syncategorematically (Tonhauser, 2011, 2015b). By assuming that temporal reference relies only on the resolution of a temporal anaphor somewhere within the context, RT is no longer dependent on the notion of 'tense' being present anywhere in the structure, be it overt or covert. Rather, so long as the anaphor is resolved by a temporal adverbial or within the larger discourse context, the utterance can receive

an interpretation.

Both approaches described here have their advantages. Under the presuppositional approach, it allows for a unified analysis of tense cross-linguistically, where tense must be present in the grammar but how tense is supplied differs from language to language. For instance, St'át'imcets has temporal reference restricted to non-future times, so Matthewson (2006b) accounts for this by assuming a covert tense restricting times to non-future times. On the other hand, the temporal anaphor approach avoids positing covert morphology present in the grammar and allows flexibility for cross-linguistic variation for how that temporal anaphor is resolved. In order to analyze Kaqchikel temporal reference, I consider both approaches to determine which analysis best accounts for the empirical facts in Kaqchikel.

In order to facilitate discussion in this chapter, there are a few definitions and the assumptions I adopt about temporal reference and event structure that should be made clear. First, I use the term 'eventuality' in the most common usage, as a cover term that encompasses both states and events (Bach, 1986; Kamp and Reyle, 1993). Further, I assume that events are dynamic and involve some sort of change within the time interval determined in the larger context or in the utterance. States are static and involve no change within the contextually determined time interval. In Kaqchikel, events are denoted by verbal predicates (i.e. inflected for TAM and person/number agreement), while states need not be verbal (e.g. nominal predicates and existential predicates). § 5.2 provides the relevant background to the the lexical aspectual classes in Kaqchikel, which fall into one of the two groups: eventive or stative. The examples in § 5.2 provide evidence that stative predicates are predominantly non-verbal in Kaqchikel. Because they are not temporal in the same sense as eventive predicates, they will be discussed in the following chapter.

5.1.2 Cross-linguistic variation of tense and aspect

The observation that languages vary with respect to how temporal relationships are encoded is not a novel one (Comrie, 1985; Bittner, 2005; Lin, 2003; Smith et al., 2003; Smith and Erbaugh, 2005; Matthewson, 2006b; Bohnemeyer, 1998; Tonhauser, 2011; Mucha, 2013). Out of this observation has sprung a lively debate

about the status of tense in languages that appear to be tenseless. A tenseless language is described as lacking a grammatical encoding of the RT with respect to UT. One of the central questions in the discussion is whether or not there are truly tenseless languages, or if tense is present underlyingly but not marked with overt morphology. The underlying tense morphology would introduce a tense presupposition of the sort described in § 5.1.1. For languages to be truly tenseless, the reference time of an utterance is established using other means, such as discourse context and temporal adverbials rather than a grammaticized tense morpheme, which is compatible with the temporal anaphor approach. However, languages like St'át'imcets (Lillooet Salish), which are at least tenseless on the surface, are observed to have a restriction on future reference times. Matthewson (2006b) provides an account of St'át'imcets as a language that is only superficially tenseless with a phonologically empty non-future tense morpheme, TENSE, restricting reference times to non-future time intervals with respect to utterance time. Another language with a similar pattern with a non-future restriction for finite clauses is Paraguayan Guaraní (Tupí Guaraní). Tonhauser (2011) tests both a tensed and tenseless analysis of Guaraní, and ultimately concludes that a tenseless approach for Guaraní is the simpler and thus preferable analysis based on evidence from subordinate clauses and other more complex sentence types.

5.1.2.1 A tensed approach

In St'át'imcets, finite clauses, which are only marked for person/number agreement, are restricted to non-future reference times. That is to say, they are superficially tenseless sentences (henceforth STSs). In example (180), (180a) shows that both a past and present reference times are compatible with the utterance, but nothing can be said about future reference times.

- (180) a. *sáy'ez'-lhkan*
 play-1 SG.SUBJ
 'I played/I am playing'
- b. *táyt-kan*
 hungry-1 SG.SUBJ
 'I was hungry/I am hungry.'
- c. *k'ác-an'-lhkan.*
 dry-DIR-1 SG.SUBJ
 'I dried it/I am drying it'

(Matthewson, 2006b, p. 676)

The reference time for the examples in (180) can be narrowed down and constrained by adding a temporal adverbial, which is shown in (181).

- (181) a. *sáy'ez'-lhkan i-tsilkstásq'et-as*
 play-1 SG.SUBJ when.PAST-Friday-3CONJ
 'I played on Friday.'
- b. *táyt-kan lhkúnsa*
 hungry-1 SG.SUBJ now
 'I am hungry now.'
- c. *k'ác-an'-lhkan i-nátcw-as.*
 dry-DIR-1 SG.SUBJ when.PAST-one.day.away-3CONJ
 'I dried it yesterday.'

(Matthewson, 2006b, p. 676)

However, Matthewson (2006b) shows that by adding a future denoting temporal adverbial as in (182), the utterance is now judged to be unacceptable.

- (182) a. **sáy'ez'-lhkan nátcw/ zánucwem*
 play-1 SG.SUBJ one.day.away/ next.year
 Intended: 'I will play tomorrow/next year.'
- b. **táyt-kan nátcw/ zánucwem*
 hungry-1 SG.SUBJ one.day.away/ next.year
 'I will be hungry tomorrow/next year.'

- c. **k'ác-an'-lhkan nátcw/ zánucwem.*
 dry-DIR-1SG.SUBJ one.day.away/ next.year
 'Intended: 'I will dry it tomorrow/next year.'

(Matthewson, 2006b, p. 676)

If STSs in St'át'imcets are only compatible with non-future denoting temporal reference, the puzzle is how to account for this restriction. Matthewson (2006b) proposes that the non-future temporal restriction is due to a phonologically null tense morpheme TENSE, where TENSE introduces the reference time as a variable over time intervals and receives its value from a contextually determined assignment function (Matthewson, 2006b, p.680). She proposes the lexical entry for TENSE given in (183), where t_c is the utterance time.

- (183) $\llbracket \text{TENSE}_i \rrbracket^{\text{g},c}$ is only defined if no part of $g(i)$ is after t_c .
 If defined, $\llbracket \text{TENSE}_i \rrbracket^{\text{g},c} = g(i)$.

(Matthewson, 2006b, p.680)

Essentially, this approach assumes that St'át'imcets finite clauses all carry this phonologically null TENSE restricting the reference time to past and present times with a tense presupposition, and discourse situated in a future reference time must be realized in some other way. Otherwise, the account would require stipulations for any clause that has a reference time not within the non-future time intervals.

The data up to this point only shows how non-future time reference is established. However, it would be odd to say that St'át'imcets restricts temporal reference permitting the realization of any future discourse. In fact, the marker *kelh* is only compatible with future oriented interpretations.

- (184) a. *sáy'ez'-lhkan kelh*
 play-1SG.SUBJ *kelh*
 '*I played / *I am playing / I will play.'
 b. *táyt-kan kelh*
 hungry-1SG.SUBJ *kelh*
 '*I was hungry / I am hungry / I will be hungry.'

- c. *k'ác-an'-lhkan kelh.*
 dry-DIR-1SG.SUBJ *kelh*
 ‘*I dried it / *I am drying it / I will dry it.’

(Matthewson, 2006b, p. 677)

The proposal by Matthewson to account for the future interpretations with *kelh* are akin to the WOLL analysis for English *will* and *would* as proposed in Abusch (1985). Under this analysis, future discourse is realized by the combination of WOLL, a future-shifting operator, plus tense. The prediction made here is that a language only allows future readings when overt morphology is present. For examples like (184), Matthewson analyzes *kelh* as the overt spellout of WOLL in St'át'imcets. Thus, the future interpretation is actually the combination of TENSE plus the future-shifting operator WOLL.

One additional issue that Matthewson addresses is a potential analysis where there are two null morphemes for non-past and future. She discredits this potential by showing examples of *kelh*, which are future-of-the-past interpretations, which is also like English *would* as the past tense plus WOLL.

- (185) *zwát-en-as s-Julianne k-wa-s kúkwpi7 kelh ta*
 know-DIR-3ERG NOM-Julianne DET-IMPF-3POSS chief *kelh* DET
skúza7-s-a i kwís-as
 child-3POSS-DET when.PAST fall-3CONJ
 ‘Julianne knew when he was born, he would become chief.’

(Matthewson, 2006b, p. 689)

If St'át'imcets had two null tenses, examples like (185) would be predicted to unacceptable, so the proposal of a null morpheme TENSE for non-future time reference and TENSE plus WOLL seems to do the work of capturing the empirical facts about St'át'imcets.

In a separate study on Guaraní, Tonhauser (2011) observes that the data is similar to St'át'imcets in that matrix clauses only marked for person/number agreement (i.e. superficially tenseless) have the same non-future restriction, which warrants consideration of a covert tense analysis as well. However, on the assumption that the non-future covert tense morpheme must be present in all matrix, the

tensed analysis for Guaraní leads to problems accounting for the behavior of some subordinate tenseless clauses and for non-initial matrix clause conjuncts, which do actually license future reference times. To make a tensed analysis work, certain stipulations would be necessary to account for these cases. As a result, Tonhauser (2011) proposes a tenseless approach.

5.1.2.2 A tenseless approach

Data from other languages including Kalaallisut (Bittner, 2005), Mandarin (Smith and Erbaugh, 2005; Lin, 2006), and Hausa (Mucha, 2013) among others have also contributed to the discussion on the status of tense in languages that lack overt tense morphology. Even amongst the classification of languages lacking tense morphology, there is variation with respect to how temporal reference is encoded. For Guaraní, the non-future restriction for STSs is the same as in St'át'imcets.

- (186) a. *Kuehe a-jahu*
 yesterday A1S-bathe
 'Yesterday, I bathed/was bathing.'
- b. *Ko'ãga a-jahu*
 now A1S-bathe
 'I am bathing right now.'
- c. *#Ko'ẽro a-jahu*
 tomorrow A1S-bathe
 Intended: 'Tomorrow I am going to bathe.'

(Tonhauser, 2011, p. 260)

While examples like (186) appear to be compatible with a non-future null tense analysis, such as with St'át'imcets, Tonhauser points to problems with that analysis for Guaraní.

First, the assumption for the null tense morpheme is that it must be present in all finite clauses. Second, there is also the prediction that future discourse is only realized with overt marking, like *kelh*, in order to get a future-shifted reading, which also should allow future-of-the-past readings. Tonhauser (2011) points to

Guaraní data, such as the example in (187), where a finite clause receives a future interpretation without any special morphology.

(187) [Context: Malena's wedding is tomorrow. She invited Paloma to sing at the wedding but doesn't know whether Paloma will come. Juan says:]

I-katu o-purahei ko'ẽro.
B3-possible A3-sing tomorrow

'It's possible that she will sing tomorrow.

(Tonhauser, 2011, p. 280)

In addition to the embedding under *i-katu*, Tonhauser shows that the future readings are also available in other matrix clauses, in the antecedent of conditionals and in temporal adjunct clauses, though it is restricted. For that reason, Tonhauser (2011) ultimately adopts a tenseless analysis where temporal reference is anaphoric to a contextually salient time rather than stipulate special rules to account for the cases where a non-future tense seems to be absent.

5.2 Background to temporal reference Kaqchikel

Before discussing the details of approaches to analyzing temporal reference in Kaqchikel, this section provides the necessary descriptive details for Kaqchikel temporal reference, some of which has already been discussed in § 2.1. First, recall that all finite verbs are obligatorily marked with one of four (tense)/aspect/mood ((T)AM) markers, which are given in Table 5.3. Because the purpose of this chapter is to investigate whether or not tense is encoded grammatically in Kaqchikel, the third column in Table 5.3 includes the potential tense analysis for each marker, which is based on what has previously been said about tense in Kaqchikel.

In addition to being inflected for (T)AM, verbs are marked for person/ number agreement. In this chapter, I only consider temporal reference for clauses containing finite verbs. Examples for fully inflected verbs for the imperfective and perfective aspect are given respectively in (188).

Morpheme	Function	Alternative function
<i>n-/y-/nk-</i>	Imperfective aspect	Present tense
<i>x-</i>	Perfective	Past tense
<i>xt-/xk-</i>	Potential mood	Future tense
<i>t-/k-</i>	Imperative/hortative mood	n/a

Table 5.3: (T)AM morphemes and functions (see Table 5.4 and Table 5.5 for full list of references for the different analyses of TAM in Kaqchikel.)

- (188) a. *y-in-atin*
 IMPF-B1S-bathe
 ‘I was/am/will be bathing.’
- b. *x-in-atin*
 PRFV-B1S-bathe
 ‘I bathed.’
- c. *y-at-in-tz’ët*
 IMPF-B2S-A1S-see
 ‘I see you.’

Note that the translation for (188b) is only a past reading because consultants find an out of the blue use of the perfective to be unacceptable, but I return to this point as a discussion as to whether or not the perfective should be analyzed as a past perfective.

In addition to the frequently used imperfective and perfective aspects, the potential and hortative/imperative moods are also available to fill the (T)AM slot, which are exemplified in (189) respectively. Note that (189b) is a regular second person singular imperative, but (189c) is in the third person singular and shows the hortative use of the marker.

- (189) a. *xk-i-wär*
 POT-B1S-sleep
 ‘I will sleep.’
- b. *k-a-pa-e’*
 IMP-B2S-stand-ITV
 Stand!

- c. *t-u-mestaj*
 IMP-B3S-forget
 ‘May he forget.’

In this study, I focus only on the perfective, imperfective and potential markers.

Lexical aspect of verbs plays an important role in understanding the overall semantic properties of a given utterance or construction. Hendrick-Krueger (1986) provides a thorough account of the lexical aspectual classes of a set of verbs in Kaqchikel using the Vendler verb classifications and test frames for distinguishing among lexical classes including statives, activities, achievements, and accomplishments. Notably, Kaqchikel has a relatively small number of verbal statives because the majority of statives can be classified as non-verbal predicates. According to Hendrick-Krueger (1986), verbal statives include *-bixon* ‘be sad’ and *-nüim* ‘be hungry’.

- (190) a. *y-i-bixon*
 IMPF-B1S-be.sad
 ‘I am sad.’
 b. *y-i-num*
 IMPF-B1S-be.hungry
 ‘I am hungry.’

These verbs are classified as statives because they follow the Vendler pattern for statives. For instance in the progressive test frame, the expectation that if a verb is stative it will be ungrammatical in this frame. In (5.2), putting *-bixon* and *-nüim* in a progressive construction does, indeed, result in ungrammaticality.

- (191) a. **tajin y-i-bixon*
 PROG IMPF-B1S-be.sad
 ‘I am being sad.’
 b. **tajin y-i-num*
 PROG IMPF-B1S-be.hungry
 ‘I am being hungry.’

The results from the Vendler test frames in Hendrick-Krueger (1986) for a limited number of verbs in Kaqchikel reveals a fairly standard divide between activities, accomplishments, and achievements. The divide between statives largely being non-verbal and activities, accomplishments and achievements verbal is less pertinent to the present chapter, but becomes important in the discussion of temporal particles in Chapter 6.

Previous descriptive accounts of the temporal reference system in Kaqchikel fall largely into two different categories of description for the tense-aspect-mood (TAM) morphemes. The first group Stoll (1958); Townsend (1961); Blair et al. (1969); Brown et al. (2006) describes Kaqchikel as a tensed language with a three-way distinction for past, present (also non-past), and future tenses, which are listed in Table 5.4.

	Stoll 1958	Townsend 1961	Blair et al. 1969	Brown et al. 2006
<i>x-</i>	past	indicative past	past	past
<i>y-/n-/nk-</i>	present	indicative present	non-past	present
<i>xt-/xk-</i>	future	indicative future	future	future (potential)
<i>t-/k-</i>	imperative	imperative/volitional	imperative subjunctive	imperative/hortative

Table 5.4: Tensed descriptions of Kaqchikel

In early accounts of Kaqchikel temporal reference (Stoll, 1958; Townsend, 1961), the TAM morphemes were given a simple three-way tense distinction for past, present and future tense for *x-*, *y-/n-*, and *xt-/xk-* respectively. The account provided in Blair et al. (1969) differs only slightly in referring to *y-/n-* as a non-past tense rather than a present tense, but it still considers the marker to be encoding grammatical tense. Brown et al. (2006) also refers to a three-way tense distinction for past, present, and future tense, but they do discuss the aspectual information that each morpheme contributes as well.

The second group has a bit more diversity with respect to the labels assigned to the morphemes, but overall converge that the markers encode aspect or mood and are not tense morphemes, (Robertson, 1992; Hendrick-Krueger, 1986; Rodríguez Guaján and García Matzar, 1997), which are listed in Table 5.5.

The description in these studies indicate Kaqchikel is a tenseless language,

	Hendrick-Krueger 1986	Robertson 1992	Rodriguez Guajan & Garcia Matzar 1997
<i>x-</i>	[-modal,+complete]	perfective	completive
<i>y-/n-/nk-</i>	[-modal,-complete]	habitual	incompletive
<i>xt-/xk-</i>	[+modal,+future]	perfective+optative	potential
<i>t-/k-</i>	[+modal,-future]	optative/imperative	imperative

Table 5.5: Non-tensed descriptions of Kaqchikel

where *x-*, *y-/n-*, are only contributing aspectual information (i.e. they relate the reference time to the event time and the temporal interpretation with respect to the utterance is determined in context). As for *xt-/xk-* and *t-/k-*, both are said to encode mood rather than aspect, although the exact semantics for *xt-/xk-* is largely under-described in each account.

Hendrick-Krueger (1986) adopts the perspective of the Prague school of linguistics, where linguistic features are analyzed in terms of privative oppositions, so a feature is either $+/-$. The privative oppositions are based on two features, where a given morpheme is analyzed as either having that feature or not. For the aspectual markers, perfective and imperfective, they are described as $[\pm\text{modal}, \pm\text{completion}]$. The mood markers are described as $[\pm\text{modal}, \pm\text{future}]$. The features noted for the mood markers indicate that futurity is considered a feature of Kaqchikel, but in Hendrick-Krueger (1986) it is unclear whether this ‘future’ feature is in terms of a future tense or just future orientation. Under her analysis, *y-/n-/nk-* is the least marked as $[-\text{modal}, -\text{completion}]$ and *xt-/xk-* is the most marked of the four morphemes.

Of the non-tensed accounts, the most recent and thorough description of the morphemes is provided in Rodríguez Guaján and García Matzar (1997). Following the tradition of most Mayanists, they analyze *x-* as the completive aspect and *y-/n-/nk-* as the incompletive aspect, which roughly correlate to the imperfective and perfective aspects ¹

The lack of consensus across prior accounts is largely due to the fact that none are directly concerned with the pinning the precise semantic contribution of

¹In Rodríguez Guaján and García Matzar (1997), the term ‘perfectivo’ is used to describe the perfect suffix, but I assume it is not used to refer to what is generally understood to be a perfective aspect.

the morphemes and are oriented towards providing a more general description of the full grammar of the language or considering cross-linguistic patterns within Mayan languages (Robertson, 1992), with the exception of Hendrick-Krueger (1986) who focuses on lexical aspect of Kaqchikel verbs. The descriptions point to a more general issue of relying on examples not situated within a discourse context, which can be misleading to what restrictions there may or may not be for how temporal reference is established. For the remainder of this chapter, I aim to resolve the disagreement of the status of tense in Kaqchikel by utilizing different methodologies, which have been used to analyze similar phenomena in other languages.

5.3 Status of ‘tense’ in Kaqchikel

Kaqchikel verbal predicates differ from both St’át’imcets and Guaraní in two respects:

1. All verbal predicates are marked for (T)AM as well as person/number agreement.
2. Clauses marked with the imperfective aspect can be interpreted as past/present *and* future without any special morphology.

With these two differences in mind, it already suggests that perhaps Kaqchikel requires an alternative proposal to account for the differences. However, I consider both the tensed and tenseless analyses for Kaqchikel in the sections that follow. I propose three (interdependent) hypotheses, which includes the consideration that the aspect/mood markers are responsible for encoding tense. If this is the case, the presuppositional account of tense might work for Kaqchikel. If, however, the markers are determined to be compatible with at least both past and present reference times, the possibility of a covert tense morpheme could apply. Finally, if neither hypothesis accounts for the empirical facts about Kaqchikel temporal reference, a tenseless approach might be best.

The three hypotheses to be tested here are:

1. The aspect/mood morphemes are also encoding tense, so there is no covert tense present because tense is overtly indicated by the aspect and mood markers in addition to aspect/mood information.
2. The aspect/mood morphemes are not encoding tense and only aspect/mood information. Tense is thus a covert morpheme restricting reference times. Additionally, to get future interpretations, special morphology must be used.
3. There is no covert or overt tense restricting reference times in Kaqchikel. Reference time is supplied only by temporal adverbials and in the discourse context.

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

5.3.1 Do Kaqchikel TAM morphemes encode aspect/mood+tense?

To test for the first hypothesis, I evaluate whether or not any of the three aspect/mood markers are restricted to only one reference time interval, which includes consideration of a past/present distinction, a past/non-past distinction or the non-future only distinction. If any of the morphemes encodes grammatical tense, the expectation is that they will be incompatible with temporal adverbials denoting various RTs with respect to utterance time. A further test that I employ in this section considers temporal adverbials that are ambiguous with respect to RT, which is exemplified in (192) with *at 6 o'clock in the morning*, where the tense in English restricts the interpretation of the adverbial as a past/present/future RT. In (192a), the past tense restricts the time interval to a past RT, so the temporal adverbial denotes a past time that coincides with 6 o'clock in the morning. However, (192b) refers to a future 6 o'clock in the morning with respect to UT.

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

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

in Kaqchikel, it suggests that tense is not being encoded by a given aspect/mood marker as is the case for English in (192).

First, the most crucial piece of data with respect to a tensed analysis is given in (193a). The verb is marked with the imperfective aspect, surprisingly based on what we have seen so far, (193a) is compatible with past, present and future temporal reference. Unsurprisingly, adding a temporal adverbial, *iwir pa tiqaq'ij* 'yesterday in the afternoon' constrains the reference time to a past time interval.

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

To further illustrate the point, (194) shows that matrix clause verbs marked with the imperfective aspect are compatible with past (194a), present (194b) and future (194c) denoting temporal adverbials.

- (194) a. *Iwir tajin y-e-xajon*
 yesterday PROG IMPF-B3P-dance
 'Yesterday, they were dancing.' (RT<UT)
- b. *Wakami tajin y-e-xajon*
 now/today PROG IMPF-B3P-dance
 'They are dancing now.' (RT=UT)
- c. *Chwaq tajin y-e-xajon*
 tomorrow PROG IMPF-B3P-dance
 'Tomorrow, they are dancing.' (RT>UT)

Note that although the imperfective aspect alone can be interpreted as an in-progress reading, use of the periphrastic progressive with the auxiliary *tajin* is preferred by the consultants I work with. The periphrastic progressive makes the interpretation clear and distinguish between the progressive and other imperfective

meanings, which is shown by the non-progressive habitual interpretation shown in (195).

- (195) a. *q'ij q'ij y-in-atin*
 day day IMPF-B 1S-bathe
 'I bathe daily.'
- b. **q'ij q'ij tajin y-in-atin.*
 day day PROG IMPF-B 1S-bathe
 Intended: I bathe daily.

Looking at the second test using underspecified temporal adverbials, I return to the example given in (194b) with the temporal adverb *wakami*, which can either be used to mean 'now' or 'today'. The same utterance can be translated as *Today, I was dancing/Now, I am dancing/Today, I will be dancing*. In order to establish whether the utterance is to be interpreted as past, present, or future, additional context is necessary. In a context where the RT is established as a future RT, (196) is no longer ambiguous between 'today/now' interpretations and further the non-future interpretations are no longer available.

- (196) [Context: What will you be doing later when I get home from work?]

tajin y-i-xajon wakami
 PROG IMPF-B 1S-dance now/today

'I will be dancing today/#I am dancing now.'

Given that the imperfective aspect is compatible with any RT and is insufficient for determining the RT of underspecified temporal adverbials, the evidence strongly supports a tenseless analysis of the imperfective aspect.

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

- (197) *x-i-jote' ch-u-wi jun juyu'*
 PRFV-B 1S-ascend PRE-A3S-RN one mountain
 'I climbed a mountain/#I will have climbed a mountain.'

Further, it is not possible to use non-past denoting temporal adverbials with the perfective aspect, which is shown in (198b). For (198a), the adverb *iwir* is felicitous, but consultants judge use of the adverb *chwaq* ‘tomorrow’ to be bad in (198b). The judgment is typically followed by the explanation from consultants that they think that use of *x-* must be in the past.

- (198) a. *Iwir, x-i-jote' ch-u-wi jun juyu'*
 yesterday PRFV-B1S-ascend PRE-A3S-RN one mountain
 ‘Yesterday, I climbed a mountain.’
- b. ‘#*Chwaq x-i-jote' ch-u-wi jun juyu'*
 tomorrow PRFV-B1S-ascend PRE-A3S-RN one mountain
 Intended: ‘Tomorrow, I will have climbed a mountain.’

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

- (199) [Context: When is your mother coming to visit?]

x-ø-pi wakami.
 PRFV-B3S-arrive now/today

‘She arrived today/#She will have arrived (by) today.’

Both (198a) and (198b) point in the direction of analyzing the perfective aspect as also being restricted to past reference times and thus encoding a past tense. However, as Tonhauser (2011) points out, more complex utterances need to be considered before reaching a conclusion or at least richer contexts which allow for the past RT interpretations to be overridden. In fact, combining both a richer context and a future denoting temporal adverbial allows for non-past reference time for the perfective aspect. In (200), the context establishes that the party under discussion is at a future time. The temporal adverbial is underspecified as to whether 8 o’clock is before or after utterance time, but in the given context it can only be interpreted as a future 8 o’clock, which constrains the RT of the entire utterance to a future time interval.

- (200) [Context: You and a friend are planning a party for 9 o'clock that night. Your mother is baking the cake for the party, and your friend is worried that she won't be there with the cake in time. You tell her:]

Pa taq a las 8 chaq'a wakami, x-ø-pi
 PRE when PRE(Sp) DET(Sp) eight night now/today PRFV-B3S-arrive
yan nu-te'
 PAR A1S-mother

'By 8 o'clock tonight, my mother will have already arrived.'

In spite of the fact that non-past interpretations do not easily arise with the perfective aspect, examples like (200) exclude the possibility of an analysis of the perfective aspect as an absolute past tense in Kaqchikel.

Similarly, the reference time for the potential mood is not easily shifted to times other than the future. In absence of additional context or a temporal adverbial, utterances with the potential mood are always interpreted with future reference times, so for (201) only the future interpretation is available.

- (201) *xk-i-b'iyin pa ri tienda*
 POT-B1S-walk PRE DET store(Sp)

'I'll walk to the store/#I was going to walk to the store.'

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

- (202) *xk-i-b'iyin pa ri tienda chwaq/iwir*
 POT-B1S-walk PRE DET store(Sp) tomorrow

'I'll walk to the store tomorrow/#yesterday.'

When combined with the temporal adverbial *wakami* 'today/now', again only a future interpretation is found to be available to speakers. In (203), the context establishes that the speaker is referring to a time prior to UT, which should allow the interpretation of the 'earlier today' reading and not just the 'later today' reading. However, the context is not sufficient for shifting the reference time of the utterance

nor the interpretation of *wakami* to a past interpretation. The response in (203) can only be interpreted as the ‘I will go to the store today.’

(203) [Context: You are asked if you’ve already been to the store to get groceries for the week. You respond:]

#xk-i-b’iyin pa ri tienda wakami
 POT-B1S-walk PRE DET store(Sp) now/today

Intended: ‘I was going to go to the store (earlier) today.’

Just as with the perfective aspect, the data up to this point suggest that the potential mood is restricted to future reference times. However, the following examples show that the potential mood can be used when a past reference time is established in complex utterances. The first example is taken from *Ri Kitziñon kan ri Qati’t Qamama*, a children’s book containing traditional folk narratives. The first line in (204a) establishes that this is a story that takes place during a past time interval. In (204b), the verb marked with the potential mood is in the subordinate relative clause under the belief-predicate *nojij* ‘to think/believe’. The time at which they believed they would be eaten by the jaguar is established as a time that follows the time the animal roars but precedes the time at which they see the cat fighting the jaguar in (204c). In this example, the potential is not interpreted as an absolute future reference time.

(204) a. *K’o cha’ jun q’ij x-ka-k’axaj jun chikop n-ø-sik’in*
 EXST QUOT one day PRFV-B3P-hear one animal IMPF-B3S-call
chunaqaj ri ko-choch.
 near DET A3P-house

‘One day they heard the roar of an animal near their houses.’

b. *Janila’ x-ø-ki-xib’ij ki’ r-uma x-ki-nojij che ri*
 very PRFV-B3S-A3P-scare 3P A3S-RN PRFV-B3P-think REL DET
chiköp xk-e-ru-tij
 animal POT-B3P-A3S-eat

‘They were frightened because they thought the animal was going to eat them.’

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

(Méndez, 2005)

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

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

(Guarcax González, 2016, 35)

Both (204) and in (205) provide strong evidence that the potential mood is also not contributing temporal reference and should be analyzed as only a mood marker.

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

5.3.2 Does Kaqchikel have covert tense?

Hypothesis 1 and hypothesis 2 are closely related and the data from the previous section already suggests that a covert tense analysis is unlikely for Kaqchikel just based on the flexibility of the imperfective aspect alone. A covert tense analysis relies on temporal restrictions to only non-future reference times, so underlyingly all finite clauses are assumed to be marked with a phonologically empty non-future tense morpheme, TENSE. Under this assumption, finite matrix clauses are predicted to be only interpreted with past or present temporal reference. We already saw that

this is not the case for Kaqchikel. Namely for finite matrix clauses marked with imperfective aspect and the potential mood, temporal reference is not restricted to non-future RTs. If a future RT is established in context or by a temporal adverbial, future interpretations are available for Kaqchikel. For (206), the context preceding the target utterance marked with the imperfective aspect introduces a salient reference time that restricts the RT of the response to past RTs. However, in (207), the context introduces an RT, which is in the absolute future of UT.

(206) [Context: You called your friend earlier that morning, but she didn't answer. You see her later and ask what she was doing that morning:]

(tajin) y-in-samäj
 (PROG) IMPF-B I S-work

'I was working.'

(207) [Context: Your friend wants to get dinner later that evening. You are unable to attend, so she asks what you will be doing instead. You respond:]

(tajin) y-in-samäj
 (PROG) IMPF-B I S-work

'I will be working.'

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

In addition to the implications for past and present RTs, the covert tense analysis has implications for how to analyze future discourse in languages that are (at least) superficially tenseless like St'át'imcets. Matthewson (2006b) argues that there is no absolute future tense category and future discourse is realized by the combination of tense (covert or overt) and a prospective aspect. The prospective aspect acts as a future-orienting operator that shifts the ET to a future time of the RT

rather than the UT. This accounts for absolute future interpretations in which the RT is at UT, so the ET is shifted to a time that temporally follows RT (RT<ET, RT=UT). It also accounts for future of the past interpretations, where the reference time is established a past RT and ET temporally follows RT (RT<ET, RT<UT) giving rise to ETs that can still be in the past with respect to UT or after as exemplified for English in (208).

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

An additional feature of the covert tense analysis is the proposal that special morphology or marking is required in order to get future interpretations, such as *kelh* in St'át'imcets. Recall that clauses for St'át'imcets cannot be interpreted as having absolute future reference times. Rather, the marker *kelh* situates the event time of the utterance to a time that temporally follows the reference time (RT<ET). If an utterance is interpreted with a future reference time for an event, this is due to the combination of TENSE restricting the reference times to non-future times plus *kelh*, which is shown in the contrast between (209) and (210) both repeated here for convenience. For (209), the reference time is restricted to either a past or a present time interval, but when *kelh* is used in (210), the playing event is shifted to a time after RT. In this case, the RT is the same as UT, so the absolute future interpretation is expected.

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

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

Data from St'át'imcets (in Matthewson, 2006b), Guaraní (in Tonhauser, 2011), and Hausa (in Mucha, 2013) all provide cross-linguistic evidence that (at least some) instances of future reference times do require special morphology (prospective aspect). However, Mucha (2013) shows that Hausa allows future interpretations

for clauses marked with the continuous aspect but without any additional special morphology.

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

The Hausa data looks quite similar to the Kaqchikel data from (207), where no additional morphology is required for the utterance to be interpreted with an absolute future RT. Ultimately, the evidence against a tensed approach has piled up. Because neither components of the covert tense analysis, a non-future restriction (or any temporal restrictions) and special morphology to realize future discourse, apply to the Kaqchikel data, the remaining hypothesis, that Kaqchikel is a truly tenseless language, is likely to be the preferred analysis.

5.3.3 Kaqchikel is a tenseless language

To summarize the results of testing for hypothesis 1 and hypothesis 2, we already saw that hypothesis 1 (*Kaqchikel TAM morphemes contribute aspect/mood+tense*) is ruled out the aspect/mood markers place no restrictions on temporal reference, namely for the imperfective aspect. Hypothesis 2 is then ruled out because finite matrix clauses in Kaqchikel are not restricted to non-future reference times nor are any other reference time restrictions (i.e. a non-past restriction). Further, future temporal reference is available for utterances that are otherwise unmarked for a prospective aspect (in the sense Matthewson's future-shifting operator). Discourse context and temporal adverbials are sufficient for giving rise to future RTs. This leaves only the issue of analyzing how temporal reference is established more generally.

Returning to the tenseless approach from Tonhauser (2011) and some aspects of the approach for Hausa in Mucha (2013, 2015), one possibility for determining time reference is to treat the RT as an implicit temporal anaphor. The anaphor is resolved the discourse context, which includes the time intervals determined by temporal adverbials. In absence of a temporal anaphor, the prediction then

is that the utterance is uninterpretable. To exemplify how an the temporal anaphor is resolved, consider the example in (212a). The temporal adverbial introduced by *töq* constrains the RT for the time at which the event of walking among the people was, so the temporal anaphor is resolved. This can also be seen in the sentence that follows in the story, where the contextually salient time is extra-sentential but present in the larger discourse. We can interpret the RT for the time interval at which the people not seeing him is the same time interval as in (212a).

- (212) a. *Töq y-e-ru-q'eje-la' kan, rija' x-ø-b'yaj la'*
 when IMPF-B3P-A3S-greet-PLUR DIR 3S PRFV-B3S-walk D
chi-ki-k'ojol
 PRE-A3S-all
 'When he greeted them, he walked among them.
- b. *xa ja ri achi'el manäq tä n-ø-ki-tz'u' ri winaq-i'*
 PAR FOC D as NEG IRR IMPF-B3S-A3P-see D people-PL
 'It seems as though the people didn't see him.'

(Méndez, 2005)

The example in (213) is similar except that the temporal adverbial is in the second clause, but the RT determined by the time at which the pencil broke provides a salient temporal anaphor constraining the RT of the first clause to the same time interval.

- (213) *Tajin nk-i-tzib'an töq x-ø-kip nu-tz-ib'-ab?äl*
 PROG IMPF-B1S-write when PRFV-B3S-break A1S-write-INST
 'I was drawing when my pencil broke.'

In elicited examples, as opposed to those from narratives as in (212a) can also have the temporal anaphor resolved outside of the utterance itself. The question in (214) constrains the RT of the response to 'now', so the response can only receive a present interpretation.

(214) [Context: What are you doing right now?]

n-φ-in-sik'ij ri nu-wuj.
IMPF-B1S-read D A1S-book

'I'm reading my book.'

The final example is just to illustrate a future denoting temporal adverbial as the temporal anaphor.

(215) *Ri juna' apo, n-φ-ki-töj ki-k'as*
D year DIR IMPF-B3S-A3P-pay A3P-debt
'Next year, they will pay their debt.'

(Brown et al., 2006, p.167)

This example also brings forward the issue of how future discourse is realized in Kaqchikel as compared to other languages, like St'át'imcets, where future discourse requires special morphology.

To realize future discourse in Kaqchikel, more than one option is potentially available. Tonhauser (2011) refers to the two possible options for how languages realize future discourse as the *reference time option* and the *eventuality time option*. The ideas are developed from a similar analysis of how eventualities are situated with respect to utterance time in more than one way (Reichenbach, 1947). Tonhauser (2011) appeals to the two possible options in order to discuss how an eventuality can be situated in the absolute future of UT. If future discourse is realized by the reference time option, there must be a salient reference time in the absolute future, and the ET is then situated as occurring in the absolute future of the UT. On the other hand, the eventuality time option assumes that all utterances have a past or present RT, and future discourse is realized by situating the ET at a time that temporally follows the RT. Tonhauser (2011) analyzes Guaraní as a language that relies on the eventuality time option, whereas English *will* constructions are an example of the reference time option.² I analyze Kaqchikel as a language that uses both the eventuality time option and the reference time option (with restrictions).

²This is on the assumption that English *will* introduces an absolute future reference time in contrast to the WOLL analysis given in Abusch (1985). This also contrasts to the 'eventuality time'

Because I analyzed Kaqchikel as a tenseless language, it may seem as though the reference time option for future discourse is ruled out in absence of grammatical tense. However, in principle it should still be available so long as there is a means for indicating absolute future temporal reference in the language. In (216), the temporal adverbial *chwaq* ‘tomorrow’ introduces an absolute future reference time because the speaker is talking about the day in the absolute future of utterance time. Note that the verb is marked with the imperfective aspect, which we already know is the only aspect marker easily shifted into different reference times using only a temporal adverbial or in context.

- (216) *Chwaq y-i-jote' ch-u-wi jun juyu*
 tomorrow IMPF-B 1S-ascend PRE-A3S-RN one mountain
 ‘Tomorrow, I’ll climb a mountain.’ (UT < RT ⊇ ET)

The eventuality time option is also available for the imperfective aspect. In (217), the temporal adverbial *iwir* ‘yesterday’ restricts the RT of the utterance to the past. However, the temporal adverbial *chaq’a wakami* ‘tonight’ situates the ET after RT, which is also located in the absolute future of UT.

- (217) *Iwir, Maria x-i-ru-b’ij chi n-ø-pe chaq’a*
 yesterday Maria PRFV-B 1S-A3S-tell REL IMPF-B3S-come night
wakami
 today/now
 ‘Yesterday, Maria told me that she is coming tonight.’

The perfective aspect, though difficult to shift to non-past RTs, can also realize future discourse with the reference time option. The earlier example of the perfective aspect shifted to a future RT (200) (partially repeated here for convenience) relies on the temporal adverbial *pa taq a las 8 chaq’a wakami* ‘By 8 o’clock tonight’ constrains the RT of the utterance to a future time. The RT is in the absolute future of the UT, and the event of the mother’s arrival, or the ET, is a completed event at or before RT.

option in English with the *is/are going to* construction, which has a present tense RT and the ET temporally follows the RT.

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

Future discourse can also be realized using the eventuality time option for the perfective as well, but it also achieved with similar difficulty as the reference time option. However, the example in (219) is constrained to a past RT by the temporal adverbial *iwir* 'yesterday'. The first event in the utterance is the saying event, which also occurs at a past time, but the temporal interpretation of the second clause containing the event of finishing the work is temporally located in the absolute future.

- (219) *Iwir, Maria x-i-ru-b'ij chi x-φ-ru-k'is*
 yesterday Maria PRFV-B1S-A3S-tell REL PRFV-B3S-A3S-finish
ru-samaj chaq'a wakami
 A3S-work night today/now
 'Yesterday, Maria told me that she will have finished her work by tonight.'

Finally, the potential mood is the only marker that I argue is restricted to the eventuality time option for future discourse. If the potential were actually a future marker, then all utterances could be interpreted as taking place in the absolute future. A further consideration is the difference between speaker choice for when to use the imperfective or the potential to describe incomplete events, such as the contrast in (220). In (220a), the imperfective aspect is used to describe the event of walking to the store at a future time. For (220b), the potential mood is used. Speaker intuitions about the difference in these examples is that the imperfective is used when there is more certainty that the event will occur, while the potential mood introduces more uncertainty of the realization of the event.

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

I argue that the RT of (220a) is a future RT (UT<RT), but the RT in (220b) is the time of utterance (UT=RT). The event description of walking to the store takes place at a time interval in the absolute future of UT, but the potential for the event to take place is only at the time the sentence is uttered. A further example of the potential mood in future discourse is given in (221). The example comes from one of the folk stories in *Ri Kitzijon kan ri Qati't Qamama'*. Prior to this in the story, a group of animals is approaching a woodpecker to ask for a favor. They need a hole drilled in a stone in order to reach food. The response of the woodpecker is in (221). Although the narrative itself takes place in the past, the clauses of concern are those embedded under *-b'ij* 'to say/tell'. He offers them a deal that in exchange for the favor they ask, he wants a dress (costume) that they have. The RT for the speech act introducing the wish or request by the woodpecker is the time he utters it, but the events described are in the absolute future of UT.

- (221) *X-u-b'ij chi-ke chï xt-u-k'öt ri abäj we*
 PRFV-A3S-tell RN-3P REL POT-A3S-drill DET stone REL
xti-ki-sipaj yan tzyäq chi-re.
 POT-A3P-give.a.gift PAR dress RN-textsc3s
 'He [the woodpecker]told them he will drill the hole in the stone if they give him the dress.'

5.4 Interpretational preferences and their implications

For the remainder of the chapter, I address one remaining issue for temporal interpretations in Kaqchikel. I already showed that the perfective aspect in absence of a rich context is incompatible with present and future interpretations. Further,

there is a strong preference for only past interpretations for clauses marked with the perfective. Under the current analysis, this is left unaccounted for. Further, all three markers discussed here have interpretational preferences, of which some are stronger than others (i.e. less easy to override with context). The imperfective tends to be interpreted with present temporal reference, the perfective with the past RT, and the potential with the future.

With the imperfective and the potential, accounting for interpretational preferences is relatively simple. Keeping the same assumptions that the RT is a temporal anaphor, utterances that are in out-of-the-blue contexts, the only contextually salient time is utterance, which is always available as an RT (Tonhauser, 2015b). Thus, the imperfective aspect is characterized as having the RT within the run time of the event. In this case, the utterance time, or 'now', is the contextually determined RT so the event denoted by the predicate marked for the imperfective is ongoing at the RT, which gives rise to a present interpretation. A similar approach works for the potential mood as well given that the potential denotes future possibilities with respect to the RT. Again, assuming that in an out of the blue context UT is the only contextually salient time for the RT, the event denoted by the potential is interpreted as future possibilities with respect to UT. The trouble begins when trying to account for the strong preference for past RTs with the perfective aspect.

Recall that the perfective aspect is defined as situating the event time within the RT. To assume that an out of the blue context only has the UT determined to be the RT, the perfective would be understood as having present temporal reference. However, the empirical facts make this account invalid because consultants only find past interpretations or future interpretations (with a really rich context) to be acceptable. The question is how this can be explained under the temporal anaphor approach without positing too many stipulations.

One possibility is the analysis given for Hausa in Mucha (2013, 2015), which appeals to pragmatic principles to address how interpretational preferences are restricted. The analysis is based off of principles proposed in Smith et al. (2003), Smith and Erbaugh (2005) and Smith et al. (2007).

The first principle deals with the deictic nature of speech, which is simply

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

1. Ongoing events are in the present
2. States (unbounded) are in the present
3. Bounded events are in the past
4. Explicit temporal reference may override [any of the above]

(Smith and Erbaugh, 2005, p. 715)

This principle does the same work that assuming the UT as the only contextually available RT in out of the blue contexts with the exception of the third point: bounded events are in the past.

The Bounded Event Constraint as posited by Smith and Erbaugh (2005) says that bounded events are not located in the present. Viewed as a fact about telic predicates, Smith and Erbaugh (2005) consider bounded events to be events that are completed (though whether the boundedness includes both the initial point and terminal point is language dependent). If a language only grammatically encodes the left-bound of an event (interpreted as the initiation point with respect to its location in time), we might expect that present tense for languages that mark tense is compatible with a perfective aspect. In fact, this is the case in Kinyarwanda. The present tense morpheme constrains the RT to UT, but the verb is marked for perfective aspect. Interestingly, the interpretation of the example in (222) is a perfect interpretation.

(222) [Context: You call someone asking where they're at when they're supposed to be meeting you. They respond:]

N-da-giy-e.

SBJ-NON.PST-go-PRFV

'I am coming.' (lit. I have come)

(Kyle Jerro, pc)

The interpretation here is only that the initiation point is completed, but the event is ongoing at UT, which gives rise to a present progressive reading.

Kaqchikel perfectives, on the other hand, behave differently, and the perfectively marked event must include both endpoints. Because bounded events must be completed within the time interval denoted by the RT, bounded events are not compatible with a present reference time. Though I acknowledge that it could be possible to have present interpretations of instantaneous events interpreted, but it would require further investigation.

I wish to make one final point about the interpretational preferences and their source. Unlike tensed analyses assuming a tense presupposition to account for temporal reference of clauses lacking overt tense, a tenseless analysis allows for the flexibility of temporal reference present in the data. Rather than assuming any temporal information is grammatically encoded as a presupposition, which cannot be cancelled, I assume that interpretational preferences are just implicatures anchoring the event with respect to speech time that can be cancelled by adding a contextually salient time. To summarize, the Bounded Event Constraint offers an explanation as to why the perfective aspect is incompatible with present interpretations in languages like Kaqchikel. As I understand it, the bounded event constraint is more a fact about event structure and the logical possibilities for realizing completed events at the moment of speech.

5.5 Summary

In this chapter, I argued for a tenseless analysis of Kaqchikel, where the reference time is a temporal anaphor, which must be resolved in the context to be interpreted. In natural speech, the time the utterance is spoken is always a contextually salient time that can serve as the antecedent for the temporal anaphor. With the exception of the perfective aspect, preferred interpretations for both the imperfective and potential can be accounted for by assuming the utterance time is a suitable antecedent. The perfective, on the other hand, disallows a present interpretation because Kaqchikel perfectives require that the reference time contain both endpoints of the event time, which blocks a present interpretation. Ultimately, I argued against the use of ‘tense’ as a grammatical category for Kaqchikel in contrast to Stoll (1958); Townsend (1961); Blair et al. (1969); Brown et al. (2006). Further, I use a different methodological approach than Robertson (1992); Hendrick-Krueger (1986); Rodríguez Guaján and García Matzar (1997); Guarcax González (2016), all of which describe Kaqchikel (T)AM mood markers just in terms of aspect and mood, in order to provide evidence that Kaqchikel is best analyzed as a tenseless language. The results from Kaqchikel contribute to the larger discussion on temporal reference from a cross-linguistic perspective by providing data from another under-studied language that lacks the grammatical category of tense. Further, the results show an interesting similarity between temporal reference in Hausa and Kaqchikel, which are subtly different than the temporal restrictions found in Guaraní and St’át’imcets. In the next chapter, I rely on the results from this temporal study in order to understand what the semantic contribution of each particles is.

Chapter 6

Particles in Kaqchikel

In this chapter, I turn my attention to particles. Particles in Kaqchikel, as well as in other Mayan languages, are very productive and determining their precise semantic contribution is often challenging. While some particles are used independent of other particles, most tend to combine with other particles to give rise to various meanings or to perform various grammatical functions. Because the particles ‘mean’ different things in combination with other particles, putting together a comprehensive analysis of particles proves to be a difficult and ambitious task. As a result, a gap exists in the literature just waiting to be filled. The goal of this chapter is a modest one: to look more narrowly at the semantic contribution of three particles *na*, *chik* and *yän* and the other particles they combine with to derive different overall meanings. The choice to focus on these particular particles is based on their connection to projective meaning and to temporal reference. While scouring the available texts for examples of constructions related to projective meaning, I quickly discovered that each particle told an interesting but perplexing story with respect to how temporal reference is established in Kaqchikel as well as to how different implications are triggered either by a single particle or by a combination of particles.

Though the investigation in this chapter is more exploratory and less precisely developed in comparison to the earlier chapters, it provides an important first look into the semantic contribution of particles in Kaqchikel to set the stage future investigations in a similar vein. I begin the chapter with a description of the function of the particle *na* and the other particles it combines with, and I show which construction triggers a potentially projective implication in contrast to use of *na* in isolation. For the second half of the chapter, I turn to two additional particles, *chik*

and *yän* and discuss their temporal implications as they relate to the discussion of temporal reference in Ch. 5, where I provided evidence that Kaqchikel temporal reference is not due to grammatical tense. Rather, an utterance or sentence is interpreted with respect to a temporal anaphor constricting the reference time, which must be resolved in order for a sentence to be interpretable. Because this particular portion of the study is in earlier stages than the rest of the dissertation, a large portion of the discussion is based on examples taking from a children's book *Ri kitzijon kan ri qati't qamama'* (Méndez, 2005), which contains numerous examples of each particle situated within folktales. I include elicited data when possible.

6.1 An introduction to particles in Kaqchikel

The label 'particle' is used as a catch-all term that applies to a large category of functional items, such as adverbs, directionals, and discourse markers. There is notable ambiguity cross-linguistically about how to classify some functional lexical items that may have properties for more than one category. English has examples where this is the case. Take, for instance, *yet*. *Yet* can have temporal meanings, as in example (223a), but it can also be used as a discourse particle similar to *nevertheless* as illustrated in (223b).

- (223) a. I haven't eaten dinner yet.
b. I broke his heart, yet he told me that he still loved me.

Based only on (223a), we might want to assume that *yet* is an aspectual particle, but the same temporal implications are not clearly a component of (223b). This suggests that a unified analysis of a given particle may not always be possible and other functions and meanings must be considered to have an overall understanding of the particle.

One issue that I already mentioned that arises when investigating particles in other languages is the difficulty in defining or labeling the particle consistently. For example, the Kaqchikel grammar by Rodríguez Guaján and García Matzar (1997) provides a functional description of many lexical items but they are often simply

labeled PAR. While the authors provide examples to illustrate some of the grammatical functions that they list, providing examples of each possible combination of the particles that occur in the language warrants a grammar of particles all on their own and is an altogether separate endeavor. Thus, many functions are not illustrated in the grammar with sentential examples. Other studies on Kaqchikel that have focused on other linguistic phenomena (see Hendrick-Krueger (1986); Henderson (2012); Guarcax González (2016); Heaton (2017) for studies on various syntactic and semantic phenomena in Kaqchikel), and thus tend to gloss particles with labels related to just one of the functions associated with particle. The variation in glossing is not to be viewed as a shortcoming of their work, but it merely highlights the inconsistency in glossing and a need for a more detailed investigation of particles. The reader may have already noted that I have also chosen to label many particles as PAR throughout the dissertation. The rationale behind choosing PAR was simply to avoid committing to a label early on that may be misleading. In order to begin filling in some of the gaps, I look at the particle *na*.

6.1.1 The particle *na*

The particle *na* first entered this investigation due to its function relating to the meaning of *still* in English, which is said to trigger an aspectual implication of a prior time. Table 6.1 provides the constructions in which *na* appears along with the common translation for each construction.

Construction with <i>na</i>	Common gloss/translation
PRFV/IMPF/POT-V <i>na</i> <i>k'a...na</i>	need to, just still
Interrogative pronoun <i>na</i>	-soever (e.g. whatsoever)
V-PRF <i>na</i>	still

Table 6.1: Constructions that *na* can occur in

While most of these uses appear in text examples and frequently in elicitation, the *-soever* use is not one that I have observed, but it appears in Brown et al. (2006) and was once pointed to by an anonymous reviewer for a conference as a

relevant example in discussions about the meaning of *na*. Given the lack of data I have for this use, I leave further discussion for future research.

In general, the particle *na* is most often glossed as ‘still’¹ (Rodríguez Guaján and García Matzar, 1997; Brown et al., 2006), and it does indeed give rise to the meaning of ‘still’ similar to the aspectual uses of *still* in English. For instance, the example in (224a) gives a base sentence without still, which is followed by (224b) that does have *still* in its aspectual use. The implication triggered in (224b) is based on Krifka (2000).

- (224) a. David is eating.
b. David is still eating. ⇒ The contextually salient eating time occurred throughout an interval including a past time and that abuts now.

The implication triggered by *still* in English is commonly considered to be a ‘prior time’ implication (Loebner, 1989; Krifka, 1998, 2000; Ippolito, 2007; Greenberg, 2009). An utterance with *still* is said to trigger a presupposition that the event denoted by the predicate is true at a past time interval, which temporally abuts the utterance time.² If the particle *na* is triggering a similar presupposition to *still*, we might consider whether or not *na* also contributes information about the overall temporal reference in the utterance. In example (225), consultants were given a context establishing that they had been doing something before now, such as working on an assignment, and someone comes along and asks them what they are doing.

- (225) [Context: You’re working on an assignment, which you’ve been doing for several hours. Your mother comes in and asks you’re doing. You respond:]

K’a tajin na n-u-samajij rij.
PAR PROG PAR IMPF-B3S-A1S-work.on paper

‘I am still working on this paper.’

¹In the Spanish texts, such as Rodríguez Guaján and García Matzar (1997), *na* is glossed as *todavía*, which does also translate to ‘still’ in English.

²This is only true for verbs in English marked with the present tense. When other tenses are involved, the ‘prior time’ implication is established with respect to the reference time of the event rather than the utterance time.

In (225), note use of the particle *k'a*. When specifically eliciting examples from consultants targeting the meaning of ‘still’, the resulting constructions always include *k'a*. When asking speakers if the construction would mean the same thing without *k'a*, they said that the meaning would be different. Since I was interested in whether or not *na* triggered the ‘prior time’ implication, I continued investigating the particles in combination using the projection tests described in Ch. 4. The example in (226) shows the results of embedding *k'a na* under a possibility modal in (226b), and realized as a question in (226c). The context is set up target the ‘prior time’ implication. The nonembedded sentence is given in (226a).

(226) [Context: Maria is writing an essay about Sololá during the war, and she wants to interview someone who lived there during the war. She is in Sololá and asks her friend if she knows around she might interview. Her friend responds:]

a. *Jeremias k'a k'o na pan Sololá.*

Jeremias PAR EXST PAR PRE Sololá

‘Jeremias is still in Sololá.’

⇒ Jeremias was in Sololá at a time interval before now.

b. *Taj Jeremias k'a k'o na pan Sololá.*

IRR Jeremias PAR EXST PAR PRE Sololá

‘Maybe Jeremias is still in Sololá.’

c. [Her friend’s mother overhears and asks the daughter:]

K'a k'o na Jeremias pan Sololá?

PAR EXST PAR Jeremias PRE Sololá

‘Is Jeremias still in Sololá?’

Consultants were then asked if Maria would want to interview Jeremias based on the above context with the expectation that consultants would respond ‘yes’ if the content triggered by *k'a na* was projective, and ‘no’ if not. The consultants agreed that Maria would definitely want to interview Jeremias, which indicates that the implication triggered by *k'a na* is projective.

Building upon the results for the projection test, I also tested for at-issueness of *k'a na*, which is illustrated in (227), where (228) represent potential responses to the conversation in (227).

(227) [Context: You overhear the following conversation between Lucy and Fernando:]

a. Lucy:

Jeremias k'a k'o na pan Sololá.
 Jeremias PAR EXST PAR PRE Sololá
 'Jeremias is still in Sololá.'

b. Fernando:

Kan tzij?
 INTS word
 'Really?'

(228) a. Lucy:

Ja, Jeremias k'o pan Sololá wakami.
 Yes Jeremias EXST PRE Sololá now/today
 'Yes, Jeremias is in Sololá now/today.'

b. Lucy:

Ja, Jeremias x-φ-k'oj-e' yän.
 Yes Jeremias PRFV-B3S-exist-POS.ITV PAR
 'Yes, Jeremias was already in Sololá.'

When consultants were asked if Lucy answered Fernando's question with the contents of either (228a) or (228b), consultants only judged the response in (228a) with the non-projective content to be an acceptable response, which suggests that the content triggered by *k'a...na* is both projective and not-at-issue.

If we stopped now, the picture would point in the direction of analyzing *na* as a particle triggering a presupposition with temporal implications. However, for each example given thus far, *na* always occurs with *k'a*. The question then emerges

as to whether or not *k'a..na* is responsible for triggering this implication or if either *k'a* or *na* is contributing this meaning alone.

First, (229) shows that *na* does appear independently of *k'a*.

(229) [Context: You are talking with a friend who hopes to have children in the next year. She says to you:]

N-u-tzët na xk-i-kowan xt-ø-in-b'an.
 IMPF-B1S-see PAR POT-b1s-able POT-B3S-A1S-do

'I need to see if I'm able to do it.'

Interestingly, the 'prior time' implication associated with *k'a...na* is no longer transparent in absence of *k'a*. In fact, the context clearly establishes that the discourse is future oriented about the potential to have children in the year that follows, which suggests that *na* in this case is not contributing the 'prior time' implication as with previous examples.

To ensure that (229) is representative of *na* without *k'a* and not just a misinterpretation of the translation on my part, an additional example of *na* independent of *k'a* is given in (230). The preceding context of the story in which it occurs establishes that the animals are starving and looking for food, when they discover that a wildcat has a secret food source. They search and search for the food and try to torture the information from the wildcat, but he refuses to tell them. They later discover the source, which is the portion of the story given in (230).

(230) a. *Ri komon chikop-i' aninäq x-ø-b'e-ki-tzet-a' akuchi'*
 D group animal-PL quickly PRFV-B3S-go-A3P-see-SS where
n-ø-tzaq pe ri ixim.
 IMPF-B3S-fall DIR D corn

'The animal council quickly went to see where the corn was falling down.

b. *Toq x-e-b'e-apon x-ø-ki-tz'ët chi kan qitzij na*
 when PRFV-B3P-go-arrive PRFV-B3S-A3P-see REL INTS truth PAR
wi.
 TR

'When they arrived, they saw that it was really true.' (Méndez, 2005)

Again, the ‘prior time’ implication is not clearly contributed in (230) in absence of *k’a*, though not quite as clearly as the next example in (231).

(231) *X-e-n-b’e-k’am-a’* *na ri qa-way; t-a-chajij la*
 PRFV-B3P-A1S-go-bring-SS PAR D A1P-tortilla IMP-A2S-guard D
qa-b’ojo’y,
 A3P-pot

‘I only need to go and grab our tortillas; you guard the pot.

(Méndez, 2005)

Considering this example in combination with the other examples in (230) and especially in (229) and (231), analyzing *na* as a trigger contributing a ‘prior time’ implication is not optimal analysis. Rather, the data given here supports the conclusion that *k’a...na* as a construction does trigger a ‘prior time’ implication similar to aspectual *still* in English. The question remains, then, as to what the function of *na* is when it appears alone as in (231).

Taking clues from the closely related language, K’ichee’, I posit that *na* is similar to *naa* in K’ichee’. Larsen (1988) describes *naa* as meaning ‘have to’ and labels it a ‘necessitative’, which is in contrast to other descriptions of *naa* as a future marker (Larsen, 1988, p.165). By considering the possibility that *na* in Kaqchikel is a necessitative modal, the examples in (230) and (229) are less of a puzzle. Looking back at (229), *na* occurred with the verb *-tzët* ‘to see’ followed by a clause with a verb marked with the potential, *-kowan* ‘be able’, where the reference time of the discourse was a future time. Interpreting *na* as a necessitative (or a necessity modal) meaning ‘must’ or ‘have to’ as Larsen puts it, the translation in context provided by consultants is plausible.

One final elicited example, which is compatible with a necessity modal interpretation of *na* is given in (232). In (232b), the *k’a...na* construction is used, which does contribute the ‘prior time’ implication, but (232c) illustrates the necessity meaning of *na* by stating that there are beans remaining that need to be cooked.

(232) [Context: You are helping prepare food for a party. You are trying to describe to your mother what has been done and what still needs to be done. You tell her:]

- a. *x- ϕ -in-chäq-irsaj* *yän ri kinaq.*
 PRFV-B3S-A1S-cook-CAUS PAR D beans
 ‘I already cooked the beans.’
- b. *Rin k’a tajin na n- ϕ -u-chäq-irsaj* *ri sqwäch.*
 1S PAR PROG PAR IMPF-B3S-A1S-cook-CAUS D potato
 ‘I am still cooking the potatoes.’
- c. *k’o na n- ϕ -kaj* *kinaq’.*
 EXST PAR IMPF-B3S-remain beans
 ‘There remain some beans (to cook).’

A great deal of work remains to be done in order to pin down the exact semantics of *na*, but the data presented here highlights the fact that *k’a...na*, but not *na* independently as I originally hypothesized, is the construction responsible for triggering a ‘prior time’ implication.

Also important is showing that *k’a* alone is not contributing the ‘prior time’ implication either. This possibility is easily ruled out by looking at the examples of *k’a*, where it functions as a discourse particle similar to *then* in English (e.g. *If you don’t want to work, then I suppose you’ll never graduate*). Rodríguez Guaján and García Matzar (1997) categorize *k’a* as a conjunction similar to Spanish *entonces* ‘then’, which is shown in example (233)

- (233) *Achike xt- ϕ -qa-b’än* *k’a* *we* *ma n- ϕ -pe* *tä chik*
 INT POT-B3S-A1P-do PAR COND NEG IMPF-B3S-come IRR PAR
q-uk’in?
 A1P-RN

‘If you don’t come, then what are we going to do?’

(Rodríguez Guaján and García Matzar, 1997, p.221)

While *k’a* does appear to function like a subordinating conjunction in (233), that is not the case for (234) when it appears in sentence final position.

the various translations for each particle is not transparent if we just compare them to English meanings. As the following sections will show, considering the verbal semantics together with the particle (and any particles it may combine with) makes the connection clearer and further allows for a semantic analysis of the meaning of *chik* and *yän*.

6.2.1 The particle *chik*

6.2.1.1 A functional description of *chik*

Starting the discussion with the particle *chik*, Rodríguez Guaján and García Matzar (1997) describe the particle as following: "ya estar en la posición o estado; indica más acciones u objetos" (trans.: 'to be in the position or state; indicates more actions or objects'). This description in combination with other common glosses or translations for the particle, give a rough starting point for determining the possible semantics for *chik* as 'already', 'anymore', and 'again'. Considering first what the English particles are doing, it offers a point of comparison. Since the goal is not to analyze English, the examples given here only serve to illustrate one of the functions of a given particle, but I make no claims about particles in English.

In (235), the first example shows use of *already*, which is followed by the implication triggered by its use. The example in (235b) illustrates use of *anymore*, and finally, (235c) shows the use of *again*.

- (235) a. Max already took out the trash.
 ⇒Max took out the trash prior to now.
- b. Max doesn't work at Radio Shack anymore.
 ⇒Max used to work at Radio Shack.
- c. Seth and Summer are fighting again.
 ⇒Seth and Summer have fought before.

While English has distinct lexical items responsible for triggering each of the above implications, *chik* is associated with all three possibilities. Though the negation is not necessarily considered a separate use, the effect on the overall meaning of the

utterance and for the implication is important. When *chik* co-occurs with certain other particles, the meaning is made clearer, such as with *jun b'ey* 'one time' to mean 'again' or when negated to mean 'not anymore'. table 6.3 includes a list of the different combinations for *chik* that give rise to the interpretations mentioned above.

Predicate or phrase type	Meaning in this context
V-	'again' or 'anymore'
i. IMPF	'again' or 'anymore'
ii. PRFV	'again' or 'anymore'
iii. POT	'again' or 'anymore'
iv. IMP	'again' or 'anymore'
NVP/V-PRF	'already' -restricted
NP	'other'

Table 6.3: Predicates where *chik* can occur

As Table 6.3 shows, *chik* can occur in combination with any aspectual classification meaning both verbal and non-verbal predicates. It also occurs in noun phrases and in such cases is interpreted to mean 'other' (e.g. *ri chik ixoq* 'the other woman')

The first point of interest for *chik* is that when it occurs with a verbal predicate marked with the imperfective, perfective, or potential or imperative, the meaning must be either 'again' or 'anymore', but never 'already'. In example (236), *chik* is preceded by the indefinite determiner *jun* 'one/a' and *b'ey* 'time', and the interpretation is 'one more time/again'. However, when *chik* occurs in the scope of negation, as in examples (237) and (238), the interpretation is 'not anymore'.

- (236) a. *Ma n-u-wajo' tä n- ϕ -chiq'irsaj ri ti'aj ak jumul chik*
 NEG IMPF-B3S-want IRR IMPF-B3S-cook D flesh chicken once PAR
 'I don't want to cook chicken again.'
- b. *Tajin n- ϕ -wär jun b'ey chik*
 PROG IMPF-B3S-sleep one time *chik*
 'S/he is sleeping again.'

(237) *Ma n-u-wajo' tä chik ri ti'aj ak.*
 NEG IMPF-A3S-want IRR *chik* D flesh chicken
 'I don't want [to eat]chicken anymore.'

(238) *Ri ki-tata' man jun k'oj tä chik.*
 D A3P-father NEG one EXST IRR *chik*
 'Their father wasn't there anymore.' (Méndez, 2005)

When *chik* occurs in non-verbal predicates, such as with the existential, or with verbal predicates marked with the perfect suffix, *chik* has the interpretation of 'already'. The examples in (239) and (240) show instances of *chik* occurring with the existential in (239) and with a verb marked for the perfect aspect in (240).

(239) *Ma Juan k'o chik wawe'.*
 CL Juan EXST PAR here
 'Juan is already here.'

(240) *E-kam-inäq chik.*
 B3P-die-PRF PAR
 'They had already died.' (Méndez, 2005)

One question I aim to answer in this chapter is the difference between the 'already' and the 'again' meanings and where those meanings arise.

Rodríguez Guaján and García Matzar (1997) provide many examples to illustrate that *chik* can occur in numerous positions within a predicate. table 6.4 provides a fairly comprehensive list that displays the various syntactic positions that *chik* can occur, which can be contrasted with the syntactic positions for other particles, such as *yän* in Table 6.6. Note that *chik* is never the first element in a phrase, which is also true for both *na* and *yän*.

I make no claims about the effect of syntax for *chik* or any of the other particles, but I use it to exemplify the diversity of *chik* as compared to the other particles discussed here.

Type of construction	Possible syntactic positions
<i>chik</i>	V <i>chik</i> (NP) EXST <i>chik</i> NP/PP ADJ <i>chik</i> NP V <i>chik</i> DIR (D) ADJ <i>chik</i> NP ADV ADV <i>chik</i> ADV <i>chik</i> N NVP.PRF DIR <i>chik</i>
NEG + <i>chik</i>	NEG EXST IRR <i>chik</i> NEG V IRR <i>chik</i> (DIR) NEG IRR <i>chik</i> V NEG <i>chik</i> V NEG ADJ IRR <i>chik</i> NEG <i>junb'ey</i> IRR <i>chik</i>
<i>jun b'ey chik</i> (also <i>jumul, jub'a</i>)	<i>junb'ey chik</i> N V <i>chik jub'a'</i> V DIR <i>junb'ey chik</i> V <i>jumul chik</i> V NP <i>jumul chik</i>

Table 6.4: Possible syntactic positions for *chik*

6.2.1.2 The semantics of *chik*

Consideration of the semantic properties of *chik* were borne out of the elicitation targeting projective content. When narrowing down lexical items and expressions to test for projection, I targeted the phrase *jun b'ey chik* as an expression comparable to *again*. In English, *again* triggers the implication that an eventuality of the same description denoted by the predicate has occurred before. The general claim for *again* is that, like *too*, it requires a suitable salient alternative to be established in the discourse³. This suggests that *again* imposes strong contextual felicity on its

³In English, the temporal requirement is thought to be existential bound, where there exists a time that precedes the reference time. For German *wieder* 'again', on the other hand, is said to be more complicated in that the temporal variable that satisfies the presupposition triggered by *wieder* is not existentially bound and receives its value from the context (Soames, 1982; Heim, 1990; Kamp

context, which is exemplified in (241).

- (241) a. I traveled to Germany last year, and I plan to travel there again this fall.
b. I have no idea whether Jane ever rented “Manhattan”, #but perhaps she is renting it again. (Simons, 2001)

The first example in (241) has an event of traveling to Germany in the first clause, and the second clause contains *again* triggering the presupposition to look for a salient alternative matching the ‘traveling’ event description. Since an alternative is available in the first clause, the presupposition is satisfied. In (241b) on the other hand, the context does not entail the presupposition triggered by *again*. The first conjunct makes it explicit that there is no known eventuality description matching renting “Manhattan”, and as a result the second conjunct is judged to be unacceptable.

If (*jun b’ey*) *chik* has similar semantics to *again*, we should expect that it triggers the same or a similar implication, where a salient alternative must be established in context. An additional observation about *again* in English is that the two (or maybe more) eventualities denoted by predicates with *again* must be referring to distinct instances of the eventuality being realized at different points in time.

Looking again at (*jun b’ey*) *chik*, the written folktales in *Ri kitzijon kan ri qati’t qamama’* provide numerous examples in which *chik* is used with verbal predicates denoting events. Further, because the tales are relatively short, they provide a contained environment in which to evaluate the proposal that (*jun b’ey*) *chik* triggers a presupposition like *again*. In the first example, the story itself begins when the father of two children, and widower, meets a new woman. She loves him, but she dislikes children, so she demands that he take the children into the forest, where they will get lost. The daughter overhears the conversation and reports back to her

and Rossdeutscher, 1994). In recent experimental work by Tiemann et al. (2014) have shown that in non-entailing contexts, German speakers actually ignore *wieder* rather than accommodate it, and the presupposition does not fail either. The results of the study and the variation for *wieder* in contrast to English *again* highlight the need to consider exactly how presuppositions that appear similar cross-linguistically are resolved, or as is the case for *wieder*, simply ignored.

brother, where they decide to take ash with them to sprinkle along the path. The example in (242) begins when the a father first takes his children into the woods.

(242) a. *Qitzij na wi pa ruka'n q'ij ri achi x-u-b'ij chi ke ri taq*
 Truth PAR PAR PRE second day D man PRFV-A3S-say PRE 3P D PL
ak'wal-a'
 child-PL

'Truly, the next day the man said to the children.'

b. *Wakami y-oj-b'e pa juyu', t-i-k'waj jub'a'*
 now IMPF-B1P-go PRE mountain IMP-B2S-bring little.bit
i-way, jub'a' i-ya'
 A2P-food little.bit A2P-water

'Now, we'll go into the forest. Bring a little bit of food and water.'

c. *Ri ti ala' x-ø-u-k'waj ri ya' pa jun tzuy.*
 D DIM boy PRFV-B3S-A3S-take D water PRE one bottle.gourd

'The boy brought with him water in a gourd (tecomate). '

d. *X-e-b'iyin nik'aj q'ij.*
 PRFV-B3P-walk half day.

'They walked for half a day.'

e. *Toq x-e'-apon pa juyu', ri ki-tata' x-u-b'ij*
 when PRFV-B3P-arrive PRE mountain D A3P-father PRFV-A3S-say
chi ke,
 PRE 3P

'When they arrived in the forrest, their father said to them.'

f. *K-ix-tz'uy-e' kan wawe', y-in-pe yan,*
 IMPF-B2P-sit-POS.ITV DIR here IMPF-B1S-come PAR

'Sit right here, and I'll come back soon.'

g. *xa xe n-ø-in-b'e-k'ama' na pe ri qa-si'.*
 PAR PAR IMPF-B3S-A1S-go-bring PAR DIR D A1P-firewood

'I'll just go get firewood for us.'

(Méndez, 2005)

Upon the departure of their father, the children wait a while before following the trail of ash back home. When they arrive back at home, their stepmother is angry

and again orders the husband to rid himself of the children. In (243), we see the first instance of *jun b'ey chik*, which refers back to the beginning of the story when she first orders him to take the children to get lost.

- (243) *Wakami k-e'-a-k'waj jun b'ey chik.*
 now IMP-B3P-A2S-take one time PAR
 'Now, you will take them again.' (Méndez, 2005)

The father again follows his new wife's orders, and takes the children out again. We get another instance of *jun b'ey chik* referring back to the first instance of venturing into the woods.

- (244) *Pa ruka'n q'ij, ri achi x-e-ru-k'waj el ri r-ak'wal jun b'ey chik.*
 PRE second day D man PRFV-B3P-A3S-take DIR D A3S-child one time
 PAR
 'The next day, he took the children again.' (Méndez, 2005)

The story continues with the same sequence of the arrival to the forrest, which is where (270) picks up the story. The sequence of events in the story again proceed in the same manner as in (242) with the father instructing the children to sit and await his return while he goes off to get firewood. This instance of *chik* occurs without *jun b'ey*, but we still get the anaphoric implication looking for a salient alternative. The events described in (242) supply a suitable alternative for the implication triggered by *chik*.

- (245) a. *Toq x-e'-apon pa juyu', ri tata'aj x-u-b'ij chik*
 when PRFV-B3P-arrive PRE mountain D father PRFV-A3S-say PAR
chi ke:
 PRE 3P
 'When they arrived in the forest, the father said to them again:
 b. *K-ix-tz'uy-e' kan pa ru-wi' la jun ab'äj la'*
 IMP-B2P-sit-POS.ITV DIR PRE A3S-head D one stone D
 'Sit down on top of that stone there.'

c. *Rin y-in-pe yan, xa xe n-ø-b'e-k'ama' na ri*
 1S IMPF-B1S-go YAN PAR PAR IMPF-B3S-go-take NA D
qa-si' x-ø-cha' kan chi ke.
 A1P-firewood PRFV-B3S-say DIR PRE 3P

‘ “I’ll come back soon. I’ll just go and get firewood for us,” he said to them.’

(Méndez, 2005)

The next example is shorter, but it also makes clear the use of *chik* referring back to a prior instance in the discourse. In the narrative that precedes the example in (246), the animals are all starving and searching everywhere for food. They discover the excrement of the wildcat, which contains evidence that the wildcat has been eating seeds. The council of animals becomes angry with the wildcat because he ate without sharing his source while the rest of the animals were starving. They begin to torture the wildcat to try and force the information out of him by sticking his snout in the smoke from a fire.

(246) *X-ki-b'öx q'aq' k'a ri' x-ki-nim ri ru-tza'm pa sib.*
 PRFV-B3P-start fire PAR D PRFV-B3P-push D A3S-nose PRE smoke

‘They (the council of animals) built a fire and stuck the snout of the wildcat in the smoke.’

(Méndez, 2005)

At this point in the story, the council pulls him out of the smoke and ask again where he got the food. After the wildcat refuses, begin to torture him again by sticking his snout in the smoke, which is indicated by *jun b'ey chik*.

(247) *R-uk'in r-onojel k-oyowal x-ki-nim ju-b'ey chik ri ru-tza'm ri*
 A3S-RN A3S-all A3P-anger PRFV-B3P-push one-time PAR D B3S-nose D
xiwan pa sib'.
 wildcat PRE smoke

‘With all of their anger, they pushed the snout of the wildcat into the smoke again.’

(Méndez, 2005)

For both examples, we get an anaphoric relationship between the event described in the sentence containing *(jun b'ey) chik* and the antecedent instance of the same type of event occurring earlier in the story. Based on the data up to this point, *chik* looks as though it triggers the same presupposition that we get for *again* in English.

The final example of the ‘again’ reading of *chik* is the result of an elicitation, which was constructed to target the presuppositional content of *chik*. The context in (248) describes a situation in which the speaker had previously been working on schoolwork, set it aside to take a break, but then starts working again. This contrasts with example (225) from the previous section for *na* in which the consultant was asked to express a contiguous working event.

(248) [Context: you were working on the paper in the past and put it aside but then came back to it, so you’re working on it again. You tell your mother what you’re doing:]

x-ø-in-chäp *ru-samaj-ik* *jun b'ey chik*.
 PRFV-B3S-A1S-begin B3S-work-NOM one time PAR

‘I’ve begun my work again.’

This example also illustrates the repetition of an event that occurred earlier in the context. What these examples all suggest, then, is *(jun b'ey) chik* triggers an implication that there is an event of the same description denoted by the predicate in which it appears that temporally precedes the event under discussion.

6.2.1.3 An analysis of *chik*

Based on the examples of *(jun b'ey) chik*, presented in this section thus far, I propose an initial pass at a definition for *chik*. In order to define *chik*, a few additional concepts are necessary. In the previous chapter, I posited that Kaqchikel is tenseless, where all finite verbal predicates are inflected for aspect or mood. However, I left out discussion of the properties of non-verbal predicates and verbs marked with the perfect suffix. However, it would be advantageous to discuss the verbal and non-verbal predicates in the same way. In order to do so, I appeal to the descriptions of stative and eventive predicates using interval semantics from Dowty

(1979). In interval semantics, eventualities are evaluated at points in time within some salient time interval. A stative predicate ϕ is defined as a predicate that is true at a subinterval, I , but also true at all subintervals of I . This definition accounts for the non-verbal predicates in Kaqchikel, but also for the imperfectively marked verbs, such as *yik'ikot* 'I'm happy', where the reference time is within the runtime of the state described by the predicate. Because the perfect is concerned with the result state of an event, it can also be considered a stative predicate under interval semantics, where the interval at which the 'perfect state' is true is true at intervals at all subintervals as well. Eventive predicates on the other hand, ϕ is only true at I , but not true for the subintervals of I , which accounts for the other verbal predicates. This definition provides a starting point for capturing the facts about Kaqchikel in way that is not restricted to describing only verbal predication.

An alternative to interval semantics that also considers similar subdivisions of the temporal properties frequently categorized under the umbrella of imperfectivity is described using the AT operator from Condoravdi (2002). In (249), the definitions are given for the AT operator for temporal reference and how the reference time and eventuality time overlap differently for stative and habitual predicates as compared to progressive predicates (see Tonhauser, 2011, for the full implementation and spell out applied to Guaraní).

- (249) a. $t_{et} \circ t_{rt} \wedge P(w,t)$ if P is stative or habitual
 b. $t_{et} \subset_{nf} t_{rt} \wedge P(w,t)$ if P is progressive
 c. $t_{et} \subseteq t_{rt} \wedge P(w,t)$ if P is perfective.

To simplify, the definitions say that stative and habitual predicates involve temporal overlap ($t_{et} \circ t_{rt}$). For the progressive, t_{rt} is a non-final interval of t_{et} ($t_{et} \subset_{nf} t_{rt}$) (for a more detailed discussion see Condoravdi, 2002; Tonhauser, 2011, *inter alia*). Finally, for perfective predicates t_{et} is subsumed by t_{rt} ($t_{et} \subseteq t_{rt}$). I adopt these definitions for temporal overlap as applied to different aspects, which allows for treatment of verbal (including imperfectively marked habitual readings) and nonverbal predicates alike. It makes a clearer distinction between the generic imperfective and the progressive as well, which avoids lumping all imperfectives under one definition.

Looking again at examples of *chik* and its semantic contribution, (250) illustrates the difference between a predicate without (*jun b'ey*) *chik*, which is given in (250a), and a predicate with the addition of *chik* in (250b). The implication triggered by (*jun b'ey*)*chik* is indicated below (250b). Note also that the content of (250a) is an entailment of the example with *chik* in (250b).

- (250) a. *X-in-wa'*.
 PRFV-B1S-eat
 'I ate.'
- b. *X-in-wa' jun b'ey chik*.
 PRFV-B1S-eat one time PAR
 'I ate again.' → I ate.
 ⇒ There was another contextually salient prior eating event.

First, by assuming that *chik* triggers a presupposition that places requirements on the utterance in order to receive a truth-value, we need to define what type of antecedent will satisfy the presupposition. For English *again*, it is also the case that the predicate containing *again* triggering the presuppositions determines the alternatives for what can serve as the contextually available antecedent to satisfy the presupposition. Crucially, the antecedent must be an eventuality of the same description as the eventuality denoted in the asserted (i.e. at-issue) content. The antecedent event must be true when evaluated at a different point in time than the time at which the at-issue content is evaluated as true or false. Here, eventuality description refers to both states and events.⁴ A definition for *chik* for the data thus far is given in (251), where *t* is the reference time and *t'* is some other time salient in the context.

(251) **Semantic definition of *chik*:**

- a. CHĪK(ϕ) is true iff ϕ is true at *t* & ϕ is true at some *t'* where $t' < t$
- b. CHĪK(ϕ) presupposes that ϕ is true at some time prior to *t*.

⁴I set aside the question for future research as to whether or not there is the restitutive reading available for *chik* although it is a property of English *again*

The definition for *chik* in (251) says that some event ϕ is evaluated at a time t . If ϕ is true at t and also true at a time t' such that t' temporally precedes t , then the utterance is evaluated as true. Further, $\text{CHİK}(\phi)$ triggers the presupposition that ϕ is true at some time before the reference time. If the presupposition is not satisfied in the context, the utterance will not receive a truth-value (leaving aside the issue of presupposition accommodation for future work). This definition captures the data for the ‘again’ instances of (*jun b’ey*) *chik*, but should be tested with other uses to determine if they can be similarly defined.

Recall that *chik* also occurs in non-verbal predicates, such as the examples with the existential *k’o(j)* in (252).

- (252) a. *Pa ja la’, x-u-na’* *chï k’o chik pa jun nima’*
 PRE FOC D PRFV-A3S-find.out REL EXST PAR PRE one big
tinamit
 town
 ‘He realized that he was already in a big city.’
- b. *K’a pa ja la’, x-u-na’* *chï k’o chik chuch’i ri*
 INTS PRE FOC DET PRFV-A3S-find.out REL EXST PAR shore D
choy
 lake
 ‘He realized that he was already back at the shore of the lake.’

(Méndez, 2005)

For each instance of *chik* given in (252), the interpretation is similar to ‘already’, which also triggers a presupposition about prior times. However, these examples are non-eventive, so the implication is not about events. It must be about states and the times at which whether or not the state holds is evaluated.

In addition to existential stative predicates, *chik* also occurs with verbs marked with the perfect aspect, which can be considered a stative as discussed earlier. For both predicates marked with the perfect in each example in (253), the result state in the stative predicate description (where I use ‘result state’ loosely to mean the ‘perfect’ state holds).

- (253) a. *Xa ma-jun x-u-na' tä qa chi e-kam-inäq chik*
 but NEG-one PRFV-A3S-find.out IRR DIR REL B3P-die-PRF.IT CHİK
 'But he didn't realize that they were already dead (lit. 'had died').'
- b. *Toq x-e-tzolin pe ki-k'am-om pe chik ri jöj*
 when PRFV-return DIR A3P-bring-PRF DIR PAR DET crow
 'When they returned, they had brought the crow.'

(Méndez, 2005)

Again, we see that the interpretations for *ekaminäq* 'has died' and *kik'amom* 'had brought' are about times at which the state holds and not about multiplicity of events. However, it does presuppose that there is a time before the reference time that the state denoted by the predicate is true.

Considering the existential and the perfect predicates in Kaqchikel, we can evaluate whether the definition provided in (251) accounts for the facts of *chik* in stative predicates. Taking just the example of the perfect in (253a), where ϕ is the state of having died.

- (254) a. CHİK(has died') is true at t iff (has died') is true at t and (has died') is true at some t' , such that $t' < t$.
- b. CHİK(has died') presupposes that (has died') is true at a time prior to t .

Here, *chik* introduces the presupposition of an additional evaluation time, which will be any time that temporally precedes the reference time, at which the state of having died must be true. If we understand the discourse in (253a) as being evaluated with respect to some salient reference time, which in this story is established in the preceding line as the time at which the man is walking around greeting the people, the meaning contributed by *chik* is that they were necessarily dead before he began walking among them. Thus, *ekaminäq* must be true at a time before the man greets the people for (253a) to be evaluated as true.

The definition for CHİK(ϕ) works for both the stative and eventive predicates by presupposing that there is a contextually salient time prior to the reference time that either the event denoted by the predicate is true or the state denoted by the event

is true.⁵

Finally, when *chik* is in the scope of negation, the meaning is ‘not again’ or ‘not anymore’.

- (255) a. *majun x- ϕ -silon* *tä chik chi-ki-wäch*
NEG PRFV-B3S-move IRR PAR RN-A3P-face
‘It [the volcano] didn’t move anymore.’
- b. *Man jun chik k’a xk- ϕ -iw-achib’ilaj* *tä r-uma wakami*
NEG one PAR PAR POT-B1P-A2P-accompany IRR A3S-RN now
yalan chik r-alal la i-pam
very PAR B3S-weight DET A2P-stomach
‘You will no longer accompany us because your stomachs are already very heavy.’

(Méndez, 2005)

Use of *chik* here still triggers the same presupposition that there must be a salient time at which the predicate ϕ is true at some t' , but it also asserts that ϕ is false at another time. Taking (255a) as an example, CHĪK(move’) must be true at t' but false at t , where t' temporally precedes t .

In the next example, the reference time of the utterance is given in the antecedent of the conditional as the time at which the animals drink the blood. At a time prior to the potential blood drinking event, there exists the possibility that the animals can become human once more but CHĪK(ϕ), the becoming human possibility, is false after the reference time at which ϕ is evaluated.

⁵I acknowledge that the definition of CHĪK here may not be strong enough for the stative predicates. A stronger definition might consider whether there is a reference interval that t' must be outside of (e.g. is it enough for t' to have occurred a millisecond before t for CHĪK(ϕ) to be true? Or is there perhaps a longer reference interval that t' must temporally precede?).

- (256) *We ri je' ni-ki-qum qa ri kik' manaq chik xk-e'-ok*
 REL 3P IMPF-A3P-drink DIR DET blood NEG PAR POT-B3P-become
tä winäq
 IRR person

If they drink the blood, they will no longer be able to become human.'

(Méndez, 2005)

The definition then, for CHİK(ϕ) nicely accounts for the three interpretations of *chik* as a presupposition triggering an implication about the evaluation of a given eventuality at some temporally preceding time with respect to the reference time.

One additional point with respect to the semantics of *chik* related to the content of the first half of the dissertation is that by assuming *chik* triggers a temporal presupposition that needs to be resolved in context, the expectation is that strong contextual felicity is at play. Consider first example (257), where *chik* occurs in a neutral context, where no additional time is mentioned in the given context.

- (257) [Context: You are hosting a party at your house and preparing food for the party with your mother. The party is set to begin at 8pm, and at 8 the doorbell rings. You answer the door and return to the kitchen to tell your mother:]

Juan k'o chik wawe'.
 Juan EXST PAR here

'Juan is already here.'

When asking consultants if (257) sounds acceptable, the intuitions were varied. Though none of the consultants found the use of *chik* completely acceptable in the given neutral context, there were consultants that judged it to be 'somewhat natural'. As a result I asked the consultants to judge the acceptability of (257) in comparison to use in an *m*-positive context with respect to the implication that a salient referent be established in the context.

(258) [Context: You are hosting a party at your house and preparing food for the party with your mother. The party is set to begin at 8pm, and at 7:30 the doorbell rings. You answer the door and then return to the kitchen to tell your mother:]

Juan k'o chik wawe'.

Juan EXST PAR here

'Juan is already here.'

Consultants judged (258) to be considerably better when *chik* is situated in an *m*-positive context, which suggests that *chik* requires contextual felicity though the strength of the requirement may not be as strong as with other projective implications, such as with *chuq'a* 'too'. More data is required in order to draw firm conclusions with respect to projection and strong contextual felicity.

6.2.1.4 The 'other' *chik*

In addition to eventive and stative predicates, *chik* also appears in noun phrases. If CHĪK applied to eventualities is semantically the same as the *chiik* that applies to nominal predicates, it would be ideal to have a parsimonious definition of *chik* that works for all predicate types. However, the definition of *chik* given in (251) is based on the assumption that *chik* introduces a presupposition about times. In order for the definition to work for nominal predicates, there would need to be evidence that function is temporal in such predicates as well. Starting with the examples in (259)-(260), *chik* is interpreted as 'other', where the suitable alternative is an entity of the same description as that denoted by the noun. In (259), *chik* is in the noun phrase *chik tinamit*, where the entity denoted by the noun is 'town'.

(259) *Re tz'ikin-a' re' e-pe-tenäq juk'an chik tinamit*
 DET bird-PL DET B3P-come-PRF.IT elsewhere PAR town

'These birds come from other towns.' (Méndez, 2005)

There is no evidence that *chik* is temporal in (259), but it is connected to the temporal uses in that it seeks an antecedent to satisfy the presupposition triggered by *chik*.

The next example supplies a clear antecedent to resolve the presupposition. *Chik* in (260) is part of the noun phrase *chik r-achalal* ‘other relatives’, where the ‘other’ refers back to the mention of *chaqa* ‘siblings’.

- (260) *Re utiw re' x-u-tzijoj chi ke chaq-a' chik r-achalal ri*
 DET coyote DET PRFV-A3S-tell PRE 3P sibling-PL PAR A3S-relatives DET
n-u-na'ojij
 IMPF-A3S-plan
 ‘The coyote told the siblings and his other relatives, his plan.’

(Méndez, 2005)

One issue the example in (260) brings up is how to determine what exactly can satisfy the presupposition for ‘other relative’. One potential solution is to think of the noun as denoting a set of individuals of a kind, such as ‘relative’, where ‘sibling’ is a subset of ‘relative’. So long as the antecedent resolving the presupposition is a member of the relevant superset, it can satisfy the presupposition. The next example further supports this perspective.

- (261) *Ri tz'i', ri ak, ri qo'l, ri patx, chuqa' chi ke chaq-a'*
 DET dog DET chicken DET turkey, DET duck also PRE 3P sibling-PL
chik awäj ri e-k'oj pa tinimüt
 PAR corral.animals DET 3P-EXST PRE town
 ‘The dogs, the chickens, the turkeys, the ducks, and also to the other corral animals that were in the town.’

(Méndez, 2005)

Here, the noun phrase ‘corral animals that were in the town’ denotes the superset containing the members ‘animals in town’, where the presupposition triggered by *chik* is satisfied by any member of the superset.

To extend the definition developed for *chik* in (251) may not be the optimal way to capture the empirical facts presented here. Rather, I propose that the *chik* in nominal predicates is a different, though related, *chik* semantically, which I refer to as $\text{CH}\ddot{\text{I}}\text{K}_{\text{NOM}}$.

- (262) *Semantic definition of* $\text{CH}\ddot{\text{I}}\text{K}_{\text{NOM}}$:
 $\text{CH}\ddot{\text{I}}\text{K}_{\text{NOM}}(\phi)$ is true iff there exists some entity ϕ and a contextually salient superset ψ such that ϕ is a member of the superset ψ

The intention of this section was to explore the various meanings related with just one particle *chik* and illustrate some of the challenges with developing one unified analysis for the different functions of the particle. In contrast to *na*, the translation of *chik* is more consistent and is easier to tease apart its meaning from the other particles it appears with, such as *jun b'ey* ‘one time’. In the final section, I consider one more particle *yän*, which also has temporal implications.

6.2.2 The particle *yän*

The final particle to discuss is *yän*, which is typically glossed as ‘already’ and sometimes as ‘soon’. This particle is absent from the descriptive grammar, and turns up only in Brown et al. (2006), a book which is intended for use as teaching material.⁶ Given the sparsity of a descriptive background for *yän* and the significantly smaller number of examples, the proposal here accounts only for the present data with the assumption that additional functions of *yän* may exist.

6.2.2.1 A functional description of *yän*

The most common meaning associated with *yän* is ‘already’. The examples in (263) show the use of *yän* in verbal predicates with the perfective aspect in (263a) and the imperfective in (263b).

(263) a. *Matix ch-a-wa po x-i-wa' yän.*
 Thanks PRE-A2S-RN but PRFV-B1S-eat PAR
 ‘Thank you, but I already ate.’

b. *Toq pe-tenäq pa b'ey x-u-nataj chi*
 when come-PRF.IT PRE road PRFV-B3S-remember REL
n-u-lqa yän ri wayeb'ik'
 IMPF-B3S-come PAR DET wayeb’

When he was walking down the road, he remembered that wayeb’ (a holiday) was already approaching.’ (Méndez, 2005)

⁶One consultant said he believes that *yän* is not Kaqchikel and is a borrowing of Spanish and most likely *ya*. Whether borrowed from Spanish into Kaqchikel or not, it is a functional item that occurs in texts and natural speech examples and deserves a place in the current discussion.

Unlike *chik*, *yän* cannot occur with non-verbal predicates, such as the existential, nor can it occur with verbs marked with the perfect suffix. In other words, *yän* does not occur in the same predicates as *chik* does for the stative interpretations, which is shown in (264). In the given context, I asked consultants if each of the utterances in (264a) and (264b) were acceptable constructions, and they all agreed that (264b) was not acceptable while (264a) is.

(264) [Context: The party starts at 8pm, but your friend shows up early at 7:30 pm. You go tell your mother about his arrival by saying:]

a. *Ma Juan k'o chik wawe'*.

CL Juan EXST PAR here

'Juan is already here!'

b. **Ma Juan k'o yän wawe'*.

CL Juan EXST PAR here

Intended: 'Juan is already here.'

This contrast is further exemplified in the following example from *Ri kitzijon kan ri qati't qamama'*, where both *yän* and *chik* appear in the listing of items already obtained. The first two clauses describing what has been acquired are verbal predicates followed by *yän*. The final clause is an existential predicate with *k'o(j)* and *chik* rather than *yän* is used.

(265) *Man y-at-b'ison, ri a-wixjayil x-ø-u-löq' yän ri kär,*
 NEG IMPF-B2S-be.sad DET A2S-wife PRFV-B3S-A3S-buy PAR DET fish
x-ø-u-löq yän ri kaxlan-wäy, k'oj chik ri kab'
 PRFV-B3S-A3S-buy PAR DET foreign-food EXST PAR DET sweet.food

'Don't worry, your wife has already bought the fish, she has already bought the bread, and there is already honey. (Méndez, 2005)

A list of the predicate and phrase types where *yän* can occur is given in Table 6.5. There is a gap in the data available for the hortative/imperative, which is represented by the '?'. Under 'meaning', the question mark beside the potential aspect, is due to having very few examples, where the translation is not transparent as 'already'. For that reason, I leave open the question as to what meaning should be assigned to *yän* in the context of the potential mood.

Predicate or phrase type	Occurs with <i>yän</i> ?	Meaning in this context
VP:	✓	varies by aspect marker on verb
i. IMPF	✓	‘soon’, ‘just (now)’
ii. PRFV	✓	‘already’
iii. POT	✓	?
iv. IMP	?	?
NVP/V-PRF	X	n/a
AdvP	✓	?

Table 6.5: Phrase types where *yän* can occur

One final point of comparison between *yän* and *chik* is their syntactic flexibility. Like *chik*, *yän* cannot appear sentence initially and is never first in the phrase or predicate that it modifies. Unlike *chik*, *yän* appears in significantly fewer phrase types and syntactic positions, which are shown in Table 6.6.

Phrase type	Possible syntactic positions
VP	V <i>yän</i> (NP) V <i>yän</i> DIR
AdvP	ADV <i>yän</i> N

Table 6.6: Possible syntactic positions for *yän*

Yän presents a less complicated picture with respect to its range of functions than does *chik*. Although both particles often get translated or glossed as ‘already’, I argue that the difference is subtle, but *yän* functions to order events with respect to other events.

Temporal ordering adverbs, such as *before* and *after* are often said to be absent in Mayan languages, where the ordering of events relies on structural ordering of the predicates, or it can be expressed using ordinal numbers, such as *nab’ey* ‘first’. I attempted to elicit examples where the ordering would be more complex, such as describing a recipe, but the results were always the same and relied on linear ordering when detailing the order of events (i.e. they always described the events in the order that they should occur). Of course, this could be just an issue for elici-

tation tasks and how they are explained, so I again considered examples in written narrative.

First, there are many examples in the narratives where *yän* occurs with the perfective aspect, which indicates event completion with respect to the reference time. In the first two examples, *yän* appears to be contributing the same semantics as ‘already’ in English, which contributes the implication that the event occurred earlier than expected. In (266), the earlier than expected event is the harvesting of the corn.

- (266) a. *Re ixim re’ aninäq x-k’iy.*
 DET corn DET quickly PRFV-B3S-grow
 ‘The corn grew quickly.’
- b. *Xa xe pa oxí’ q’ij x-e-ki-jäch’ yän*
 PAR PAR PRE three day PRFV-B3P-A3P-harvest PAR
 ‘On the third day, they were already harvesting.’

(Méndez, 2005)

The next examples also imply that the event occurs earlier than expected. First, in (267), night came more quickly than expected. In the larger context of the story, the man is walking from town to town, when he realizes night has fallen. He then stops and asks a vendor if he can stay the night. The first line in his plea is that in (267).

- (267) *Qitzij tat x-ø-ok yän pe ri aq’a’*
 true sir PRFV-B3S-enter PAR DIR DET night
 ‘It is true sir, it is already night.’

In the same narrative, the man also realizes that the holiday *wayeb’* was very soon.

- (268) *Toq pe-tenäq pa b’ey x-u-nataj chi n-u-lqa*
 when come-PRF.IT PRE road PRFV-B3S-remember REL IMPF-B3S-come
yän ri wayeb’ik’
 PAR DET wayeb’

When he was walking down the road, he remembered that *wayeb’* (a holiday) was approaching.’

(Méndez, 2005)

In a longer example from the narratives, *yän* occurs in a context compatible with the implication that the event is earlier than expected. In this case, the event is the caging of the animals, so that he can continue on his path. The old man goes out to count the animals, and returns with the message that the animals have already been caged, which means he can be on his way shortly.

- (269) a. *K'ari', ri ti ch'uti achi x-e-b'e-ru-tz'eta' ri chikop-i'*
 and.then DET DIM little man PRFV-B3P-go-A3S-see DET animal-PL
 'And then the little old man went to see the animals.'
- b. *X-e-r-ajilaj k'ari x-u-b'ij chi-re ri k'ayinel*
 PRFV-B3P-A3S-count and.then PRFV-A3S-tell RN-3S DET vendor
 'He counted them, and then he told the vendor...'
- c. *chì ütẗ n-b'e r-uma x-e'-ok yän k-onojel ri*
 REL good IMPF-go A3S-RN PRFV-B3P-enter PAR A3P-all DET
kumatzi', ri b'alam.
 snakes DET jaguars
 '...that he was able to go because the snakes and jaguars had already entered'
- d. *Man jun chik k'ayewal tä pa b'ey.*
 NEG one *chik* danger IRR PRE road
 There is no more danger in the road.'

(Méndez, 2005)

While considering the contribution of *yän* to be similar to *already* seems applicable to (266) and (267), the story falls short of accounting for some of the data. Take, for instance, the example in (270), the use of *yän* here clearly lacks the implication of 'earlier than expected' in the same way as the earlier examples for both English *already* and for Kaqchikel. This example was glossed and translated with *yän* to be 'soon'.

- (270) a. *K-ix-tz'uy-e' kan pa ru-wi' la jun ab'äj la'*
 IMP-B2P-sit-POS.ITV DIR PRE A3S-head D one stone D
 'Sit down on top of that stone there.'

- b. *Rin y-in-pe yän, xa xe n- ϕ -b'e-k'ama' na*
 1S IMPF-B1S-come-take PAR PAR D A1P-firewood PRFV-B3S-say
ri qa-si' x- ϕ -cha' kan chi ke.
 DIR PRE 3P
 ‘ ‘I’ll come back soon. I’ll just go and get firewood for us’, he said to them.’

(Méndez, 2005)

If *yän* has similar semantic properties as *chik*, where the anaphor seeks a salient antecedent time at which an eventuality is evaluated, the interpretation of (270) is not predicted. I propose, instead, that *yän* serves to order events in time.

6.2.2.2 An analysis of *yän*

Looking again at (270), the interpretation is that the ‘returning’ event will be sooner than the children might expect. Before committing to an analysis of *yän* based on examples like (270) where the ‘earlier than expected’ implication is evident, other examples not so neatly categorized as triggering such an implication must be considered.

First, consider the example in (271), where *yän* is part of the verb phrase *ye’el* ‘coming out’.

- (271) *wakami y-e’-el yän pe ri chikop-i’ man xa atux*
 now/today IMPF-B3P-come PAR DIR DET animal-PL NEG PAR something
xt-a-k’ulwachij pa b’ey
 POT-A2S-come.across PRE road
 ‘Now the animals are already coming out, you should not go lest there be something in your path.’

(Méndez, 2005)

Suppose that what *yän* is actually doing here is ordering the events in the discourse. It signals that the event denoted by ϕ in $YÄN(\phi)$ occurs before the event denoted by some other event ψ . For (271), $YÄN(\text{coming out})$ is temporally the first event of the two described in the example, where the potential ‘leaving’ event temporally

follows. Further, the ‘animals coming out’ event is the cause for why the man should not leave.

The possible analysis of *yän* functioning to order events is supported by (272). In this example, YÄN(give a gift’) is a condition placed on the other event described in the sentence by ‘drill a hole’. The ordering of the two events is a significant part of the condition dictated by the woodpecker, where the gift-giving must occur before he does them a favor.

- (272) *X-u-b’ij* *chi-ke chi xt-u-k’öt* *ri abäj we*
 PRFV-A3S-tell RN-3P REL POT-A3S-drill DET stone REL
xti-ki-sipaj ***yän*** *tzyäq chi-re.*
 POT-A3P-give.a.gift PAR dress RN-textsc3s

‘He the woodpecker told them he would drill the hole in the stone if they would give him the dress.’

(Méndez, 2005)

Assuming *yän* orders events with respect to other events, accounting for examples with only one event depicted appear to be problematic, such as from example (266) (partially repeated here).

- (273) *Xa xe pa oxi’ q’ij x-e-ki-jäch’* ***yän***
 PAR PAR PRE three day PRFV-B3P-A3P-harvest PAR

‘On the third day, they were already harvesting.’

(Méndez, 2005)

In (273), only one event is involved, so what is *yän* temporally preceding if not an event? Here, I posit that *yän* here implies there is an ‘expected time’ and ϕ is realized before that time. This ‘expected time’ is a presupposition triggered by *yän* in contexts where only one event is under discussion. For examples when *yän* occurs in contexts describing two events with respect to one another, the presupposition triggered is that YÄN(ϕ) temporally precedes ψ .

Finally, there is one example to mention in which *yän* appears in a non-verbal predicate. It occurs with occurs with *janipe* ‘how many’ as part of the introduction to one of the stories.

(274) *Ojer chik ojer chik, man jun etema-yom chi janipe' yän juna'*
 long.ago PAR long.ago PAR NEG one know-PRF.T REL how.many PAR
 year

'Long, long ago, no one knows exactly how many years.'

(Méndez, 2005)

Here, *yän juna'* is interpreted as 'years before/ago', which also preserves the temporal ordering interpretation for *yän* in that the years under discussion temporally precede the time at which the story is being told.

Though not the most precise definition, it accounts for the interpretations of *yän* discussed thus far. With more data and elicitations focused on the implications triggered by *yän*, the picture might become much clearer allowing for a more precise definition.

6.3 Summary and open questions

In this chapter, I introduced three particles *na*, *chik* and *yän*, and I provided a preliminary account for their semantic contribution both independently as well as in combination with other particles. In order to develop more precise and comprehensive analyses for each of the particles, far more elicited data is needed. For instance, to determine whether or not the particle is necessary to give rise to the meanings discussed here, minimal pairs with and without the particles are needed. Further, minimal pairs for the particles that co-occur for certain meanings, such as *k'a...na*, would also make the distinction clearer. In spite of the need for more data, which will always be the case in research, investigating the three particles, *yän*, *chik* and *yän*, by considering the implications that they trigger led to the discovery that the individual particles were not always responsible for triggering an implication. Rather, particles like *chik* and *na* must co-occur with certain particles in order to give rise to certain meanings. Additionally, this chapter considered the effect of *yän* and *chik* on the interpretation of temporal reference for an utterance, which was discussed in detail in Ch. 5. The results of the investigation provide important

insights into how overall meaning of an utterance can be altered by just a particle, thus highlighting the need to consider the properties of additional particles in more detail to understand both the projective implications that arise as well as the overall temporal interpretations of utterances, which are important aspects of meaning to understand in any language.

Chapter 7

Conclusion

This dissertation began with a discussion of non-literal meaning in natural language which contributes to the overall interpretation of sentence or utterance meaning. When a speaker utters a sentence, both the asserted (literal) content and the implications triggered by choosing certain linguistic expressions are used to convey the intended overall meaning. This dissertation focused on the category of meaning referred to as projective meaning, where content is said to be projective if unaffected when embedded under entailment canceling operators. In Chapter 3, I provided the diagnostics that target projective implications including embedding the sentence containing a given projective trigger under negation, in the antecedent of a conditional, realizing it as a question, and under a possibility modal. Chapter 3 also proposed a set of linguistic expressions in Kaqchikel hypothesized to be projective, and that had previously not received any sort of analysis with respect to implications that the expressions trigger. In Chapter 4, I provided evidence that the given expressions are, indeed, projective in Kaqchikel. Further, the behavior of the Kaqchikel triggers pose striking similarities to the observed behavior of projective implications in both English and Guaraní as detailed in Tonhauser et al. (2013).

With respect to the properties of the Kaqchikel triggers, the data given in Chapter 4 also supports the conclusion that only some projective triggers, such as *chuq'a* and the 3S pronoun *riya'*, place constraints on the contexts in which they can felicitously appear, i.e., only some triggers impose strong contextual felicity. Other projective triggers, such as expressives and factive predicates, place no such constraints on the context and are thus able to be used in neutral, non-entailing contexts. I additionally provided evidence that not all projective implications must have their effect locally when embedded under propositional attitude verbs, such

as the belief-predicate *-qu* ‘think’. For example, the implication triggered by a nominal appositive need not be a part of the epistemic state of the holder of the belief-predicate, but the content of the implication triggered by *chuq’a* must be part of the belief-holder’s epistemic state. That is to say, the implication triggered by *chuq’a*, but not nominal appositives, has obligatory local effect. Ultimately, the data provided additional evidence for cross-linguistic patterns of projective meaning across three unrelated languages. The summary of the results for English and Guaraní from (Tonhauser et al., 2013, p.103) in combination with the results from this dissertation for Kaqchikel are given in Table 7.1. In Tonhauser et al. (2013), they provide a taxonomy of projective content with four subclasses: Class A, Class B, Class C, and Class D. Table 7.1 replicates this division across subclassifications divided based on the three properties tested for in Chapter 4.

The fact that all three languages have projective implications with comparable meanings that pattern the same way suggests that projective meaning is not only a language internal phenomenon. Rather, there are cross-linguistic tendencies for this specific type of conventionalized meaning.

In Chapter 4, I also discussed the connection between projective meaning and at-issueness, where the prediction is that projective implications will also be not-at-issue content with respect to the current QUD. The data given here provides evidence in favor of concluding that projective meaning tends to be the not-at-issue content. However, there have been numerous recent experimental studies, which show variation across projective triggers with respect to how robust such tendencies truly are (Zondervan et al., 2008; Zondervan, 2007; Xue and Onea, 2011; Syrett and Koev, 2015; Destruel et al., 2015; Chemla and Schlenker, 2012; Chemla and Bott, 2013; Chemla, 2009; Amaral et al., 2011; Amaral and Cummins, 2014; Tiemann et al., 2014; Schwarz and Tiemann, 2016). For instance, the content of the complements of some factive predicates are more likely to be at-issue than the content of the implication triggered by *chuq’a* ‘too’. The results from working with Kaqchikel consultants discussed in Chapter 4 alluded to this potential with the judgments of one particular speaker, who always found the content of the complement to be potentially at-issue. This suggests a need for experimental work on the connection

between projection and at-issueness in a language like Kaqchikel in order to gain a deeper understanding as to whether or not being more at-issue means being less projective for a given trigger.

The data provided in Chapter 4 also provided novel data for the first larger systematic study of the category of projective meaning in, not only Kaqchikel, but also in any Mayan language. The implications of such a study provide the base for future studies in other Mayan languages, as well as other language families.

Finally, the last two chapters shifted focus to the temporal domain of Kaqchikel by first investigating whether or not Kaqchikel is best analyzed as a tensed or tenseless language. Based on evidence primarily from the imperfective aspect, I concluded that Kaqchikel lacks the grammatical category of tense, and the reference time is a temporal anaphor which must be resolved by a contextually salient time within the discourse. Previous descriptions of Kaqchikel temporal reference largely fell into two categories: (i) tensed approaches, where the imperfective, perfective, and potential were also described to encode tense (Stoll, 1958; Townsend, 1961; Blair et al., 1969; Brown et al., 2006), and (ii) tenseless approaches with the incomplete and complete aspect correlating to the imperfective and perfective aspect and the potential (Rodríguez Guaján and García Matzar, 1997; Hendrick-Krueger, 1986; Robertson, 1992; Guarcax González, 2016). Within the second group, the descriptions were based on isolated sentences not situated in discourse contexts. The data provided in Chapter 5 provided novel data on Kaqchikel temporal reference, which relied on context-induced elicitations in order to make clear the preferred tenseless analysis of Kaqchikel.

In Chapter 6, I attempted to fuse together the study of temporal reference and projective meaning by studying the properties of three particles, *na*, *chik* and *yän*. I argued that *na*, contrary to the function and meaning commonly attributed to it, is best analyzed as a necessitative modal rather than a temporal particle that only gives rise to the ‘prior time’ implication when it occurs with *k’a*. *Chik* and *yän*, on the other hand, trigger implications which are temporal in nature. First, *chik* triggers a presupposition that there is an additional time besides reference time and event time at which the eventuality denoted by the predicate is evaluated, and

further, the time temporally precedes the reference time. *Yän* functions to order predicates in time either with respect to other events, where *yän*(ϕ) presupposes that ϕ temporally precedes other events in the utterance or temporally precedes an ‘expected time’ for the realization of the event.

For both categories of meaning discussed in detail in this dissertation, there is still significant work to be done. There are certainly other linguistic expressions in Kaqchikel that trigger projective implications. Further, there are other aspects of temporal reference, such as the semantics of modality, that should be studied in more detail. However, this dissertation provided data that narrows down the larger gaps that exist in the literature for Kaqchikel related to both categories of meaning. The dissertation also considers the interaction between projection and temporal reference in a way not done before in Kaqchikel or other closely related languages. This study also highlights how cross-linguistic patterns can be strikingly similar, such as with projection, but also interestingly different, such as with establishing temporal reference. The results bear on studies within the Mayan language family by illustrating how an Eastern Mayan language, Kaqchikel, establishes temporal reference in contrast to the more distantly related Yucatec as discussed in Bohnemeyer (1998) and Bohnemeyer (2002). As for projection and projective triggers, the data given here serves as a potential template for constructions across Mayan languages that might be considered to trigger projective implications, which would pave the way for consideration of the typology of projective meaning (or temporal reference for that matter) within a language family highlighting both the similarities in projective triggers but also the diversity within family.

<i>Language</i>	<i>Trigger/Implication</i>	<i>Projective?</i>	<i>SCF?</i>	<i>OLE?</i>
ENGLISH	Pronoun/existence of referent	✓	✓	✓
	<i>too</i> /existence of alternative	✓	✓	✓
GUARANÍ	<i>ha'e</i> (3rd)/existence of referent	✓	✓	✓
	<i>avei</i> /existence of alternative	✓	✓	✓
KAQCHIKEL	<i>riya'</i> (3s)/existence of referent	✓	✓	✓
	<i>chuq'a</i> /existence of alternative	✓	✓	✓
ENGLISH	Expressives/attitude toward referent	✓	-	-
	Appositives/truth of content	✓	-	-
	NRRC/truth of content	✓	-	-
	Possessive NP/possessive relation	✓	-	-
GUARANÍ	Expressives/attitude toward referent	✓	-	-
	Appositives/truth of content	✓	-	-
	NRRC/truth of content	✓	-	-
	Possessive NP/possessive relation	✓	-	-
	<i>ha'e</i> (3rd)/human referent	✓	-	-
KAQCHIKEL	Expressives/attitude toward referent	✓	-	-
	Appositives/truth of content	✓	-	-
	NRRC/truth of content	✓	-	-
	Possessive NP	✓	-	-
	<i>riya'</i> (3s)/human referent	✓	-	-
ENGLISH	<i>almost</i> /polar implication	✓	-	✓
	<i>know</i> /content of complement	✓	-	✓
	<i>only</i> /prejacent implication	✓	-	✓
GUARANÍ	<i>aimete</i> 'almost' /polar implication	✓	-	✓
	<i>(oi) kuaa</i> 'know' /content of complement	✓	-	✓
	<i>-nte</i> 'only' /prejacent implication	✓	-	✓
KAQCHIKEL	<i>jub'a' ma/yamer</i> 'almost' /polar implication	✓	-	✓
	<i>-etamaj</i> 'know' /content of complement	✓	-	✓
	<i>xa xe</i> 'only' /prejacent implication	✓	-	✓
ENGLISH	<i>that N</i> /indication of suitable referent	✓	✓	-
GUARANÍ	Dem NP /indication of suitable referent	✓	✓	-
KAQCHIKEL	Dem NP /indication of suitable referent	✓	✓	-

Table 7.1: A comparison of projective meaning in English, Guaraní and Kaqchikel based on (Tonhauser et al., 2013, p.103)

Bibliography

- Abrusán, M. (2011). Predicting the presuppositions of soft triggers. *Linguistics and Philosophy* 34(6), 491–535.
- Abrusan, M. (2016). Presupposition cancellation: explaining the ‘soft-hard’ trigger distinction. *Natural Language Semantics* 24, 165–202.
- Abusch, D. (1985). *On verbs and time*. Ph. D. thesis, University of Massachusetts, Amherst.
- Abusch, D. (1997). Sequence of tense and temporal de re. *Linguistics and Philosophy* 20(1), 1–50.
- Abusch, D. (2002). Lexical alternatives as a source of pragmatic presuppositions. In B. Jackson (Ed.), *Proceedings of SALT XII*, Ithaca, NY, pp. 1–20. CLC Publications.
- Aissen, J. (1992). Topic and focus in mayan. *Language* 68(1), 43–80.
- Aissen, J. (1999). Agent focus and inverse in tzotzil. *Language* 75, 451–485.
- Aissen, J. (2011). On the syntax of agent focus in k’ichee’. In K. Shklovsky, P. M. Pedro, and J. Coon (Eds.), *Proceedings of Formal Approaches to Mayan Linguistics I*, Volume 63, Cambridge, pp. 1–16. MIT Working Papers in Linguistics.
- Aissen, J. and R. Zavala (Eds.) (2010). *Predicacion secundaria en lenguas de Mesoamerica*. Mexico City: CIESAS.
- Amaral, P. and C. Cummins (2014). A cross-linguistic study on information backgrounding and presupposition projection. In F. Schwarz (Ed.), *Experimental Perspectives on Presuppositions*. Springer International Publishing.

- Amaral, P., C. Cummins, and N. Katsos (2011). Experimental evidence on the distinction between foregrounded and backgrounded meaning. In *Proceedings of the ESSLLI 2011 Workshop on projective meaning*, Ljubljana.
- Bach, E. (1986). The algebra of events. *Linguistics and Philosophy* 9(1), 5–16.
- Beaver, D. (1997). Presupposition. In J. van Benthem and A. ter Meulen (Eds.), *The Handbook of Logic and Language*, pp. 939–1008. Amsterdam: Elsevier.
- Beaver, D. (2001). *Presupposition and Assertion in Dynamic Semantics*. Stanford, CA: CSLI Publications.
- Beaver, D. (2007). Accommodation. In G. Ramchand and C. Reiss (Eds.), *The Oxford Handbook of Linguistic Interfaces*, pp. 533–538. Oxford University Press.
- Beaver, D. and B. Clark (2003). Always and only: Why not all focus sensitive operators are alike. *Natural Language Semantics* 11, 323–362.
- Beaver, D. and B. Geurts (2014). Presupposition. In E. N. Zalta (Ed.), *The Stanford Encyclopedia of Philosophy* (Winter 2014 ed.). Metaphysics Research Lab, Stanford University.
- Beaver, D. and J. Tonhauser (2015, July 16-18). Projective meaning: Shadows on the wall. Talk presented at Experimental Pragmatics at the University of Chicago.
- Bittner, M. (2005). Future discourse in a tenseless language. *Journal of Semantics* 22, 339–387.
- Bittner, M. (2014). *Temporality: Universals and Variation*. Oxford: Oxford University Press.
- Blair, R., L. Campbell, A. Juracan, E. de Jesus Matzar, J. Robertson, B. Smith, J. Stone, and R. Thompson (1969). *Cakchiquel Basic Course*, Volume 2. Provo: BYU University Printing Service.
- Bochnak, R. and L. Matthewson (Eds.) (2015). *Methodologies in Semantic Fieldwork*. Oxford: Oxford University Press.

- Bohnenmeyer, J. (1998). *Time relations in discourse: Evidence from Yukatek Maya*. Ph. D. thesis, Tilburg University.
- Bohnenmeyer, J. (2002). *The grammar of time reference in Yukatek Maya*. Munich, Germany: Lincom.
- Bohnenmeyer, J. (2009). Temporal anaphora in a tenseless language. In W. Klein and P. Li (Eds.), *The expression of time in Language*, pp. 83–128. Berlin: Mouton de Gruyter.
- Bott, L. and I. A. Noveck (2004). Some utterances are underinformative: The onset and time course of scalar inferences. *Journal of Memory and Language* 51(3), 437–457.
- Brown, R., J. Maxwell, and W. Little (2006). *La utz awach?: Introduction to Kaqchikel Maya Language and Culture*. Austin: University of Texas Press.
- Bybee, J., R. Perkins, and W. Pagliuca (1994). *The evolution of grammar: Tense, aspect and modality in languages of the world*. Chicago: The University of Chicago Press.
- Cable, S. (2013). Beyond the past, present, and future: Towards the semantics of 'graded tense' in gikuyu. *Natural Language Semantics* 21, 219–276.
- Chemla, E. (2009). Universal implicatures and free choice effects: Experimental data. *Semantics and Pragmatics* 2(2), 1–33.
- Chemla, E. and L. Bott (2013). Processing presuppositions: Dynamic semantics vs pragmatic enrichment. *Language and Cognitive Processes* 38(3), 241–260.
- Chemla, E. and P. Schlenker (2012). Incremental vs. symmetric accounts of presupposition projection: An experimental approach. *Natural Language Semantics* 20(2), 177–226.
- Chierchia, G. and S. McConnell-Ginet (1990). *Meaning and grammar: An introduction to semantics*. Cambridge: MIT Press.

- Chomsky, N. (1977). *Essays on Form and Interpretation*. New York: North-Holland.
- Clifton, C. J. and L. Frazier (2012). Discourse integration guided by the 'question under discussion'. *Cognitive psychology* 65(2), 352–379.
- Comrie, B. (1976). *Aspect*. Cambridge: Cambridge University Press.
- Comrie, B. (1985). *Tense*. Cambridge: Cambridge University Press.
- Condoravdi, C. (2002). Temporal interpretation of modals: Modals for the present and for the past. In D. Beaver, C. Martinez, B. Clark, and S. Kaufmann (Eds.), *The construction of meaning*, pp. 59–87. Stanford, CA: CSLI Publications.
- Cummins, C., P. Amaral, and N. Katsos (2012). Experimental investigations of the typology of presupposition triggers. *Humana Mente* 23, 1–15.
- Deo, A. (2009). Unifying the imperfective and the progressive: Partitions as quantificational domains. *Linguistics and Philosophy* 32(5), 475–521.
- Deo, A. (2016). Imperfectivity. m.s. for Wiley Companion to Semantics.
- Destruel, E. (2013). *An empirical investigation of the meaning and use of the French c'est-cleft*. Ph. D. thesis, University of Texas at Austin.
- Destruel, E., E. Onea, D. Velleman, D. Bumford, and D. Beaver (2015). A cross-linguistic study of the not-at-issueness of exhaustive inferences. In F. Schwarz (Ed.), *Experimental Perspectives on Presuppositions*, Volume 45 of *Studies in Theoretical Psycholinguistics*, pp. 135–156. Springer.
- Dowty, D. (1979). *Word meaning and Montague grammar*. D. Reidel Publishing, Dordrecht.
- England, N. (2003). Maya linguists, linguistics, and the politics of identity. In I. Mey, G. Pizer, H.-Y. Su, and S. Szmania (Eds.), *Proceedings of the Tenth Annual Symposium about Language and Society - Austin*, Volume 45, pp. 33–45.

- Erlewine, M. Y. (2016). Anti-locality and optimality in kaqchikel agent focus. *Natural Language and Linguistic Theory* 34(2), 429–479.
- Frege, G. (1892). Uber sinn und bedeutung. In B. McGuinness (Ed.), *Frege: Collected works*, pp. 157–177. Oxford: Basil Blackwell.
- Gazdar, G. (1979a). *Pragmatics: Implicature, Presupposition and Logical Form*. New York: Academic Press.
- Gazdar, G. (1979b). A solution to the projection problem. In C.-K. Oh and D. Dinneen (Eds.), *Syntax and Semantics 11: Presupposition*, pp. 57–89. New York: Academic Press.
- Geurts, B. (1996). Local satisfaction guaranteed. *Linguistics and Philosophy* 19, 259–294.
- Geurts, B. (1998). Presuppositions and anaphors in attitude contexts. *Linguistics and Philosophy* 21, 545–601.
- Geurts, B. and D. Beaver (2012). Presupposition. In K. von Stechow, C. Maienborn, and P. Portner (Eds.), *Semantics: An international handbook of natural language meaning*, Volume 3, pp. 2432–2460. Berlin: Mouton de Gruyter.
- Gil, D. (2001). Escaping eurocentrism: fieldwork as a process of unlearning. In P. Newman and M. Ratliff (Eds.), *Linguistic Fieldwork*, pp. 102–132. Cambridge: Cambridge University Press.
- Greenberg, Y. (2009). Presupposition accomodation and informative considerations with aspectual still. *Journal of Semantics* 26(1), 49–86.
- Grice, H. P. (1970). *Logic and conversation*. na.
- Guarcax González, J. C. (2016). Las cláusulas relativas en el kaqchikel de sololá. Master's thesis, CIESAS.
- Heaton, R. (2017). *A typology of antipassives, with special reference to Mayan*. Ph. D. thesis, University of Hawai'i at Manoa.

- Heim, I. (1982). *On the Semantics of Definite and Indefinite Noun Phrases*. Ph. D. thesis, University of Massachusetts at Amherst.
- Heim, I. (1983). On the projection problem for presuppositions. In M. Barlow, D. Flickinger, and M. Westcoat (Eds.), *Second Annual West Coast Conference in Formal Linguistics*, Stanford University, pp. 114–126.
- Heim, I. (1990). Presupposition projection. In R. van der Sandt (Ed.), *Reader for the Nijmegen workshop on presupposition, lexical meaning, and discourse processes*. University of Nijmegen.
- Heim, I. (1992). Presupposition projection and the semantics of attitude verbs. *Journal of Semantics* 9, 183–221.
- Heim, I. (1994). Comments on abusch's theory of tense. In H. Kamp (Ed.), *Ellipsis, tense and questions*. Amsterdam: University of Amsterdam.
- Heim, I. and A. Kratzer (1998). *Semantics in Generative Grammar*. Oxford: Blackwell.
- Henderson, R. (2012). *Ways of pluralizing events*. Ph. D. thesis, University of California Santa Cruz.
- Hendrick-Krueger, R. (1986). *The verbal category system of Cakchiquel Mayan*. Ph. D. thesis, University of Chicago.
- Himmelman, N. (1998). Documentary and descriptive linguistics. *Linguistics* 36, 161–195.
- Himmelman, N. (2006). Language documentation: What is it and what is it good for? In J. Gippert, N. P. Himmelman, and U. Mosel (Eds.), *Essentials of Language Documentation*, pp. 1–30. Berlin and New York: Mouton de Gruyter.
- Horn, L. (1969). A presuppositional analysis of only and even. In *Papers from the Fifth Regional Meeting of the Chicago Linguistics Society*, pp. 98–107. University of Chicago.

- Huang, Y. and J. Snedeker (2009). Online interpretation of scalar quantifiers: Insight into the semantics pragmatics interface. *Cognitive psychology* 58(3), 376–415.
- Huang, Y. and J. Snedeker (2011). Logic and conversation revisited: Evidence for a division between semantic and pragmatic content in real-time language comprehension. *Language and Cognitive Processes* 26(8), 1161–1172.
- Ippolito, M. (2007). On the meaning of some focus-sensitive particles. *Natural Language Semantics* 15, 1–34.
- Jasinskaja, E. (2009). *Pragmatics and prosody of implicit discourse relations: the case of restatement*. Ph. D. thesis, University of Tübingen.
- Jayez, J., V. Mongelli, A. Reboul, and J.-B. van der Henst (2014). Weak and strong triggers. In F. Schwarz (Ed.), *Experimental Perspectives on Presuppositions*, pp. 173–194. Springer International Publishing.
- Jóhannsdóttir, K. and L. Matthewson (2008). Zero-marked tense: The case of gitsxan. In *Proceedings of NELS 37*, University of Massachusetts, Amherst. GLSA.
- Kamp, H. (1971). Formal properties of ‘now’. *Theoria* 37, 227–273.
- Kamp, H. (1981). A theory of truth and semantic representation. In J. Groenendijk, T. Janssen, and M. Stokhof (Eds.), *Formal methods in the study of language: Proceedings of the third Amsterdam colloquium*, Volume I, Amsterdam, pp. 227–321. Mathematical Center.
- Kamp, H. (2001). The importance of presupposition. In C. Rohrer, A. Rosdeutscher, and H. Kamp (Eds.), *Linguistic Form and its Computation*, pp. 207–254. CSLI.
- Kamp, H. and U. Reyle (1993). *From discourse to logic*. Kluwer, Dordrecht.

- Kamp, H. and A. Rossdeutscher (1994). Drs-construction and lexically driven inference. *Theoretical Linguistics* 20, 165–235.
- Karttunen, L. (1971a). Implicative verbs. *Language* 47(2), 340–358.
- Karttunen, L. (1971b). Some observations on factivity. *Papers in Linguistics* 5, 55–69.
- Karttunen, L. (1973a). Presuppositions and linguistic context. *Theoretical Linguistics* 1, 181–194.
- Karttunen, L. (1973b). Presuppositions of compound sentences. *Linguistic Inquiry* 4, 167–193.
- Karttunen, L. and S. Peters (1977). Requiem for presupposition. In *BLS3, Proceedings of the Third Annual Meeting of the Berkeley Linguistic Society*, Berkeley, CA, pp. 266–278.
- Karttunen, L. and S. Peters (1979). Conventional implicatures in montague grammar. In C.-K. Oh and D. Dineen (Eds.), *Syntax and Semantics 11: Presupposition*, pp. 1–56. New York: Academic Press.
- Kehler, A. (2004). Discourse topics, sentence topics, and coherence. *Theoretical Linguistics* 30(2-3), 227–240.
- Klein, W. (1994). *Time in Language*. London: Routledge.
- Koenig, E. (1991). *The meaning of focus particles: A comparative perspective*. Routledge.
- Kratzer, A. (1998). More structural analogies between pronouns and tenses. In D. Strolovitch and A. Lawson (Eds.), *Proceedings of Semantics and Linguistic Theory* 8, pp. 92–110.
- Kratzer, A. (2012). *Modals and Conditionals*. Oxford: Oxford University Press.

- Krifka, M. (1998). Additive particles under stress. In D. Strolovitch and A. Lawson (Eds.), *Proceedings of Semantics and Linguistic Theory 8*, Ithaca, NY, pp. 111–128. CLC Publications.
- Krifka, M. (2000, February). Alternatives for aspectual particles: Semantics of still and already. Paper presented at the Berkeley Linguistics Society.
- Langendoen, T. D. and H. Savin (1971). The projection problem for presuppositions. In C. Fillmore and D. Langendoen (Eds.), *Studies in Linguistic Semantics*, pp. 373–388. Holt and Reinhart and Winston.
- Larsen, T. (1988). *Manifestations of Ergativity in Quiche Grammar*. Ph. D. thesis, University of California, Berkeley.
- Law, D. (2017). Language mixing and genetic similarity. *Diachronica* 34(1), 40–78.
- Lewis, C. (1943). The modes of meaning. *Philosophy and Phenomenological Research* 4, 236–240.
- Lin, J.-W. (2003). Temporal reference in mandarin chinese. *Journal of East Asian Linguistics* 12, 259–311.
- Lin, J.-W. (2006). Time in a language without tense: The case of chinese. *Journal of Semantics* 23, 1–53.
- Lin, J.-W. (41). A tenseless analysis of mandarin chinese revisited: a response to sybesma 2007. *Linguistic Inquiry*, 305–329.
- Loebner, S. (1989). German schon-erst-noch: An integrated analysis. *Linguistics and Philosophy* 12, 167–212.
- Loebner, S. (1999). Why german schon and noch are still duals. *Linguistics and Philosophy* 22, 45–107.

- Maddox, M. C. (2011). *Chwa'q chik iwonojel: Language affect, ideology, and intergenerational language use patterns in the Quinizilapa Valley of highland Guatemala*. Ph. D. thesis, Tulane University.
- Matthewson, L. (2004). On the methodology of semantic fieldwork. *International Journal of American Linguistics* 70, 369–415.
- Matthewson, L. (2006a). Presuppositions and cross-linguistic variation. In *Proceedings of NELS 26*.
- Matthewson, L. (2006b). Temporal semantics in a supposedly tenseless language. *Linguistics and Philosophy* 29, 673–713.
- Matthewson, L. (2008). Pronouns, presuppositions and semantic variation. In *Proceedings of SALT XVIII*, pp. 527–550.
- Matthewson, L. (2013). On how (not) to uncover cross-linguistic variation. In *Proceedings of North East Linguistic Society*, Volume 42, Amherst, MA, pp. 323–342. GLSA.
- Maxwell, J. (2011). Bilingual bicultural education: Best intentions across a cultural divide. In T. Smith and W. Little (Eds.), *Mayas in Postwar Guatemala: Harvest of Violence Revisited*. Tuscaloosa: University of Alabama Press.
- Maxwell, J. and R. Hill (2006). *Kaqchikel Chronicles*. Austin: University of Texas Press.
- Méndez, L. (Ed.) (2005). *Ri kitzijon kan ri qati't qamama'*. Serie Tzijonik. Guatemala City, Guatemala: Cholsamaj.
- Mucha, A. (2013). Temporal interpretation in Hausa. *Linguistics and Philosophy* 36, 371–415.
- Mucha, A. (2015). *Temporal Interpretation and Cross-linguistic Variation*. Ph. D. thesis, University of Potsdam.

- Onea, E. and D. Beaver (2011). Hungarian focus is not exhausted. In *Semantics and Linguistics Theory* 19, pp. 342–359.
- Partee, B. (1973). Some structural analogies between tenses and pronouns in english. *The Journal of Philosophy* 70, 601–609.
- Partee, B. (1984). Nominal and temporal anaphora. *Linguistics and Philosophy* 7, 243–286.
- Patal Majzul, F. (2007). *Rusoltzij ri Kaqchikel*. Cholsamaj.
- Patal Majzul, F., G. A. Gallina, and R. C. Catú (2005). *Kitzijonik qati't qamama'*. Serie Tzijonik. Antigua, Guatemala: OKMA.
- Peters, S. (1979). On the truth-conditional formulation of karttunen's account of presupposition. *Synthese* 40(2), 301–316.
- Portner, P. (2009). *Modality*. Oxford: Oxford University Press.
- Potts, C. (2005). *The Logic of Conventional Implicatures*. Oxford University Press.
- Prior, A. (1967). *Past, present and future*. Oxford: Oxford University Press.
- Reichenbach, H. (1947). *Elements of Symbolic Logic*. London: Macmillan.
- Roberts, C. (1996). Information structure in discourse: Towards an integrated formal theory of pragmatics. In J.-H. Yoon and A. Kathol (Eds.), *Papers in Semantics (Working papers in Linguistics 49)*. The Ohio State University.
- Roberts, C. (2011). Only: a case study in projective meaning. In B. Partee, M. Glanzberg, and J. Skilters (Eds.), *Formal Semantics and Pragmatics: Discourse, Contexts and Models, The Baltic International Yearbook of Cognition, Logic and Communication*, Volume 6, pp. 1–59. New Prairie Press.
- Roberts, C. (2012). Information structure in discourse: Towards an integrated formal theory of pragmatics. *Semantics and Pragmatics* 5(6), 1–69.

- Roberts, C. (2013). Information structure: Afterword, with bibliography of related work. *Semantics and Pragmatics* 5(7), 1–19.
- Robertson, J. S. (1992). *The History of Tense/Aspect/Mood/Voice in the Mayan Verbal Complex*. University of Texas Press.
- Rodríguez Guaján, J. O. and P. García Matzar (1997). *Rukemik ri Kaqchikel Chi': Gramática Kaqchikel*. Guatemala City, Guatemala: CIRMA.
- Rothschild, D. (2008). Presupposition projection and logical equivalence. *Philosophical Perspectives* 22(1), 473–497.
- Russell, B. (1905). On denoting. *Mind* 14, 479–493.
- Schlenker, P. (2007). Anti-dynamics: Presupposition projection without dynamic semantics. *Journal of Logic, Language and Information* 16(3), 256–325.
- Schlenker, P. (2008). Be articulate: A pragmatic theory of presupposition. *Theoretical Linguistics* 34, 157–212.
- Schlenker, P. (2009). Local contexts. *Semantics and Pragmatics* 2(3), 1–78.
- Schwarz, F. (2007). Processing presupposed content. *Journal of Semantics* 24, 373–416.
- Schwarz, F. (2014). Presuppositions are fast, whether hard or soft - evidence from the visual world. In *Proceedings of SALT 24*, pp. 1–22.
- Schwarz, F. (Ed.) (2015a). *Experimental Perspectives on Presuppositions*. Studies in Theoretical Psycholinguistics. Springer International Publishing.
- Schwarz, F. (2015b). Experimental work in presupposition and presupposition projection. *Annual Review of Linguistics* 2.
- Schwarz, F. (2015c). Introduction: Presuppositions in context - theoretical issues and experimental perspectives. In *Experimental Perspectives on Presuppositions*, pp. 1–38. Springer International Publishing.

- Schwarz, F., J. Romoli, and C. Bill (2015). Processing scalar implicatures: Slowly accepting the truth (literally). In *Proceedings of Sinn und Bedeutung 19*.
- Schwarz, F. and S. Tiemann (2012). Presupposition processing - the case of german 'wieder'. In *Post-Proceedings of the Amsterdam Colloquium 2011*.
- Schwarz, F. and S. Tiemann (2013). The path of presupposition projection in processing - the case of conditionals. In G. W. E. Chemla, V. Homer (Ed.), *Proceedings of Sinn und Bedeutung 17*, pp. 509–526.
- Schwarz, F. and S. Tiemann (2016). Presupposition projection in online processing. *Journal of Semantics*.
- Shannon, B. (1976). On the two kinds of presuppositions in natural language. *Foundations of Language 14*, 247–249.
- Simons, M. (2001). On the conversational basis of some presuppositions. In R. Hastings, B. Jackson, and Z. Zvolensky (Eds.), *Proceedings of Semantics and Linguistic Theory 11*, Ithaca, NY, pp. 431–448. CLC Publications.
- Simons, M. (2003). Presupposition accommodation: Understanding the stalnakerian picture. *Philosophical Studies 112*(3), 251–278.
- Simons, M. (2004). Presupposition and relevance. In Z. Szabó (Ed.), *Semantics vs. Pragmatics*, pp. 329–355. Oxford University Press.
- Simons, M. (2006). Foundational issues in presupposition. *Philosophy Compass 1*(4), 357–372.
- Simons, M. (2007). Observations on embedding verbs, evidentiality, and presupposition. *Lingua 117*(6), 1034–1056.
- Simons, M. (2011). Dynamic pragmatics, or, why we shouldn't be afraid of embedded implicatures. In N. Ashton, A. Chereches, and D. Lutz (Eds.), *Semantics and Linguistics Theory 21*, pp. 609–633. CLC Publications.

- Simons, M., J. Tonhauser, D. Beaver, and C. Roberts (2010). What projects and why. In *Proceedings of Semantics and Linguistic Theory 20*, Ithaca, NY, pp. 309–327. CLC Publications.
- Smith, C. (1991). *The Parameter of Aspect*. Dordrecht: Kluwer.
- Smith, C. and M. Erbaugh (2005). Temporal interpretation in mandarin chinese. *Linguistics* 43, 713–756.
- Smith, C., E. Perkins, and T. B. Fernald (2003). Temporal interpretation in navajo. In *Proceedings of SULA 2*, pp. 175–192.
- Smith, C., E. Perkins, and T. B. Fernald (2007). Time in navajo: Direct and indirect interpretation. *International Journal of American Linguistics* 73, 40–71.
- Soames, S. (1979). A projection problem for speaker presupposition. *Linguistic Inquiry* 10, 623–666.
- Soames, S. (1982). How presuppositions are inherited: a solution to the projection problem. *Linguistic Inquiry* 13, 483–545.
- Soames, S. (1989). Presupposition. In D. Gabbay and F. Guenther (Eds.), *Handbook of Philosophical Logic*, Number IV, pp. 553–616. Dordrecht: Reidel.
- Stalnaker, R. (1972). Pragmatics. In D. Davidson and G. Harman (Eds.), *Semantics of Natural Language*, pp. 389–408. Reidel.
- Stalnaker, R. (1973). Presuppositions. *The Journal of Philosophical Logic* 2, 447–457.
- Stalnaker, R. (1974). Pragmatic presuppositions. In M. Munitz and P. Unger (Eds.), *Semantics and Philosophy*, pp. 197–214. New York University Press.
- Stalnaker, R. (1998). On the representation of context. *Journal of Logic, Language and Information* 7, 3–19.

- Stiebels, B. (2006). Agent focus in mayan languages. *Natural Language and Linguistic Theory* 24, 501–570.
- Stoll, O. (1958). *Etnografía de Guatemala*. Editorial del Ministerio de Educacion Publica.
- Stout, T. (2016). A investigation of projective meaning in kaqchikel. In T. Bui and R. Ivan (Eds.), *The Proceedings of the Ninth Conference on the Semantics of Under-Represented Languages of the Americas*, Amherst, MA. GLSA University of Massachussetts, Amherst.
- Strawson, P. F. (1950). On referring. *Mind* 59, 320–344.
- Syrett, K. and T. Koev (2015). Experimental evidence for the truth conditional contribution and shifting of information status of appositives. *Journal of Semantics* 32(3), 525–577.
- Tallman, A. and T. Stout (2016). The perfect in chacobo (pano) from a cross-linguistic perspective. In T. Bui and R.-R. Ivan (Eds.), *Preceedings of SULA 9*, pp. 197–212.
- Tiemann, S., M. Kirsten, S. Beck, I. Hertrich, and B. Rolke (2014). Presupposition processing and accommodation: An experiment on wieder (‘again’) and consequences for other triggers. In F. Schwarz (Ed.), *Experimental Perspectives on Presuppositions*, pp. 39–66. Springer International Publishing.
- Tonhauser, J. (2006). *The temporal semantics of noun phrases: evidence from Guarani*. Ph. D. thesis, Stanford University.
- Tonhauser, J. (2011). Temporal reference in guarani, a tenseless language. *Linguistics and Philosophy* 34(3), 257–303.
- Tonhauser, J. (2012). Diagnosing(not)-at-issue content. In *Proceedings of Semantics of Under-represented Languages of the Americas 6*, Amherst, pp. 239–254. GLSA.

- Tonhauser, J. (2015a). Are 'informative presuppositions' presuppositions? *Language and Linguistic Compass* 9(2), 77–101.
- Tonhauser, J. (2015b). Cross-linguistic temporal reference. *Annual Review of Linguistics* 1, 129–154.
- Tonhauser, J., D. Beaver, J. Degen, M.-C. de Marneffe, C. Roberts, and M. Simons (2015, July 16-18). Negated evaluative sentences: What projects, and why? Talk presented at Experimental Pragmatics, University of Chicago.
- Tonhauser, J., D. Beaver, C. Roberts, and M. Simons (2013). Toward a taxonomy of projective content. *Language* 89(1), 66–109.
- Tonhauser, J. and L. Matthewson (2016). Empirical evidence in research on meaning. Paper on Lingbuzz.
- Townsend, W. (1961). *Cakchiquel Grammar*, Volume 1 of *Mayan Studies*. SIL University of Oklahoma.
- Tummons, E. (2010). Positionals in kaqchikel. Master's thesis, University of Kansas.
- van der Sandt, R. (1988). *Context and Presupposition*. London: Croom Helm.
- van der Sandt, R. (1989). Presupposition and discourse structure. In R. Bartsch, J. van Benthem, and P. van Emde Boas (Eds.), *Semantics and Contextual Expression*, pp. 287–294. Dordrecht: Foris.
- van der Sandt, R. (1992). Presupposition projection as anaphora resolution. *Journal of Semantics* 27(3), 343–397.
- van Eijck, J. (1994). Presupposition failure: a comedy of errors. *Formal Aspects of Computing* 6(6), 766–787.
- van Rooij, R. (2003). Conversational implicatures and communication theory. In J. van Kuppevelt and R. Smith (Eds.), *Current and new directions in discourse and dialogue*, pp. 283–303. Kluwer, Dordrecht.

- van Rooij, R. (2007). Strengthening conditional presuppositions. *Journal of Semantics* 24, 289–304.
- Velleman, L. (2014). *Focus and movement in a variety of K'ichee'*. Ph. D. thesis, University of Texas at Austin.
- Velleman, L. and D. Beaver (2016). Question-based models of information structure. In C. Féry and S. Ishihara (Eds.), *The Oxford Handbook of Information Structure*. Oxford University Press.
- von Stechow, K. and L. Matthewson (2008). Universals in semantics. *The Linguistic Review* 25(1-2), 139–201.
- Xue, J. and E. Onea (2011). Correlation between presupposition projection and at-issueness: An empirical study. In *Proceedings from the Workshop on Projective Meaning at ESSLLI 2011*, Ljubljana.
- Zeevat, H. (1992). Presupposition and accommodation in update semantics. *Journal of Semantics* 9, 379–412.
- Zeevat, H. (1999). Explaining presupposition triggers. In *Proceedings of the Twelfth Amsterdam Colloquium*, Amsterdam, pp. 19–24. ILLC.
- Zondervan, A. (2007). Experiments on qud and focus as a contextual constraint on scalar implicature calculation. In U. Sauerland and K. Yatsushiro (Eds.), *From experiment to theory, Proceedings of experimental pragmatics*. Palgrave Macmillan.
- Zondervan, A., L. Meroni, and A. Gualmini (2008). Experiments on the role of the question under discussion for ambiguity resolution and implicature computation in adults. In *Proceedings of Semantics and Linguistic Theory 18*, Cornell, pp. 765–777. CLC Publications.