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Diachrony of the Perfect Paradigm in Mayan Languages

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Diachrony of the Perfect Paradigm in Mayan Languages

by

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Dedication

For Nora

who always believed in me

and

For Angela

who has stood by me every step of the way

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Abstract

Diachrony of the Perfect Paradigm in Mayan Languages

James Brenden Tandy, Ph.D.

The University of Texas at Austin, 2023

Supervisor: Danny Law

The purpose of this dissertation is to reconstruct the history of perfect aspect morphology in the Mayan language family of Guatemala, Belize, and Mexico. Using data from descriptive grammars, I reconstruct the form of the proto-Mayan perfect suffix for transitive and intransitive verbs, and I show how this paradigm changed in the descendant languages as suffixes were innovated, lost, or changed function. In doing this, I highlight how language contact has affected the picture of Mayan perfect marking. This dissertation contributes to the understanding of Mayan linguistic prehistory and, more broadly, provides a case study of reconstructing derivational morphology by comparing language-specific contexts of use.

A major claim of this dissertation is that the proto-Mayan perfect was not a canonical inflectional category and instead had derivational characteristics. I argue that the proto-Mayan active and passive transitive perfect constructions were both synchronically based on a patient nominalization, marked with the suffix **(-o)-'m*. The widespread perfect suffix *-b'il*, which Kaufman (2015: 319) reconstructed as the proto-

Mayan passive perfect participle, I take to be a Western Mayan innovation that spread to other Mayan languages by contact.

Among other specific claims, this dissertation accounts for the areal spread of the Eastern Mayan *-maj* perfect suffix, which I argue was innovated in Poqom and spread to other Eastern Mayan languages by way of a previously unrecognized contact zone, the Sacapulas Corridor. I also discuss the proto-Central Mayan **-ooj/-uuj* derivational suffix, which has infinitival reflexes in most Mayan languages but marks perfect aspect in Poqom, Tseltalan, and Tojol-ab'al; I reconstruct it as an infinitive and account for its development into a perfect suffix in these subgroups.

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Abbreviations

1,2,3	1st, 2nd, 3rd person
A	Set A/ergative
ABST	Abstract
ACT	Active
ADJ	Adjectivizer
ADV	Adverb
AF	Agent Focus
AGT	Agentive
AP	Antipassive
ART	Article
ASP	Aspect (unspecified)
ATTEN	Attenuative
ATTR	Attributive
B	Set B/absolutive
CAUS	Causative
CESS	Cessive aspect
CL	Clitic (unspecified)
CLS	Classifier
COM	Completive aspect
CVC	Consonant-vowel-consonant
DEF	Definite
DEM	Demonstrative
DEP	Dependent
DET	Determiner
DIM	Diminutive
DIR	Directional
DISTR	Distributive
DTV	Derived transitive verb
DUR	Durative
EP	Epenthetic
EXCL	Exclusive
EXST	Existential
FOC	Focus
FUT	Future
GEN	Genitive
HAB	Habitual
HUM	Human (classifier)
IMP	Imperative
INC	Incompletive
IND	Indefinite
INDIR	Indirective
INF	Infinitive
IRR	Irrealis
ITER	Iterative
IV	Intransitive
MASC	Masculine
MID	Middle voice
MP	Mediopassive
N	Noun
NEG	Negation
NF	Non-finite
NOM	Nominalization
P	Plural agreement
PART	Particle
PAS	Passive
PAT	Patientive
PTCP	Participle
PERF	Perfect
PFV	Perfective
PH.FIN	Phrase final
PL	Pluralizer
POS	Positional
POSS	Possessive
POT	Potential
PRCN	Processional
PRED	Predicate
PREP	Preposition
PRO	Pronoun
PROG	Progressive
PST	Past
REC	Recent past
REDUP	Reduplication
RN	Relational noun
RTV	Root transitive verb
S	Singular
STAT	Stative
SUB	Subordinator
SUF	Suffix
TH.V	Thematic vowel
TNS	Intensifier
TOP	Topic

TV	Transitive verb	VERS	Versive
V	Vowel	V_R	Root-harmonic vowel
V_1	Previous vowel lengthens		

Chapter 1: Introduction

1.1. OVERVIEW

The purpose of this dissertation is to reconstruct the history of perfect aspect morphology in the Mayan language family of Guatemala, Belize, and Mexico. Advances in linguistic description of Mayan languages in the last several decades have made it easier to compare cognate grammatical constructions across the family. Using the detailed data from recent descriptive grammars, I reconstruct the form of the proto-Mayan perfect suffix for transitive and intransitive verbs, and I show how this paradigm changed in the descendant languages as suffixes were innovated, lost, or changed function. In doing this, I highlight how language contact has affected the picture of Mayan perfect marking. This dissertation contributes to the understanding of Mayan linguistic prehistory and, more broadly, provides a case study of reconstructing derivational morphology by comparing contexts of use.

An overarching theme of this dissertation is concern for intermediate stages. Beyond reconstructing the state of affairs in proto-Mayan, I discuss how each construction changed as the family diversified, and what the paradigm would have looked like in each intermediate proto-language. This is helpful as a reality check, as there must be a plausible pathway of change between the proto-language and descendant languages (Thomason and Kaufman 1988: 202, Watkins 1991: 170, Hale 2014). It will also set the

stage for more detailed research within each subgroup: as a specific example, understanding the broad strokes of proto-K'iche'an morphology is important as a backdrop for exploring variation and change in K'iche'an languages at a shallower time depth.

The remainder of this chapter describes the theoretical background of this dissertation: the process of morphosyntactic reconstruction, typology of morphological borrowing, the semantics of perfect marking, and a paradigmatic approach to derivational morphology. Chapter 2 provides background on Mayan languages and their structure. Chapters 3 and 4 cover the diachrony of perfect marking with intransitive and transitive verbs respectively. In particular, chapter 4 discusses one widely attested Mayan perfect suffix (*-b'il*) and weighs the evidence for borrowing or shared retention: I ultimately argue that *-b'il* is widespread due to areal diffusion. Chapter 5 discusses another perfect suffix, *-maj*, that spread areally through a previously unrecognized contact area. Chapter 6 reconstructs the morphosyntax of the infinitival suffix **-ooj/-uuj* in detail and explores its relationship to the perfect. Chapter 7 concludes by assembling a model of the history of the Mayan perfect and by suggesting future research directions. (I expand on this outline in section 2.5 after giving more background on Mayan languages.)

1.2. PRINCIPLES OF MORPHOSYNTACTIC RECONSTRUCTION

This dissertation focuses on morphological and, to some extent, syntactic reconstruction in Mayan languages. Morphological reconstruction is generally considered more challenging than phonological reconstruction, because morphological change is not

as regular as sound change (Koch 2014: 286). Where morpheme boundaries in a language are clear, the forms of individual morphemes can be reconstructed, just like the forms of lexical words, but phonological changes can obscure the boundaries between morphemes. Even when the form of a morpheme has stayed relatively intact across time, its function may have changed (Koch 2014: 297-300). Moreover, the distribution of a morpheme or morphological pattern may change due to analogy (Koch 2014: 301-303).

Syntactic reconstruction is even more complex. As Willis (2011: 413) and Walkden (2014: 51) note, sentences are generated, not learned. That is, children do not simply memorize a finite set of sentences; instead, they acquire abstract syntactic structures that allow them to generate an infinite number of new sentences. Historical linguists have the challenge of accounting for how these abstract structures are passed on and, if possible, reconstructing an earlier state of the language. Lightfoot (1979, 2002) rejected the idea that syntactic reconstruction was possible at all, because the transmission of grammar is not continuous. Children do not directly "learn" syntactic structures and minimally modify them over time, as with lexical words that undergo sound changes. Rather, a child will hear the output of an adult grammar and will form hypotheses to explain that output grammar, which may or may not match the grammar in the adult's mind. For Lightfoot, this discontinuity makes syntactic change so unconstrained that it is impossible to recover an unattested original state, except in cases where the descendant languages are identical (2002: 134).

Other authors are more optimistic. Harris and Campbell (1995: 371) state that historical linguists are not interested in the mental grammar of a proto-language speaker, but in the actual (surface) patterns of language use in the past. An overt syntactic pattern may show more continuous transmission, and its surface structure can be compared across descendant languages, even if new generations of speakers reanalyze the

underlying structure that generates that pattern. Harris and Campbell's focus on overt patterns of language use anticipates Barðdal's (2013) Construction Grammar approach to historical reconstruction: within Construction Grammar, lexical words, idioms, and open-ended syntactic patterns are all considered the same type of element, "constructions." Syntactic patterns differ from lexical words only in that they contain unspecified elements (for example, a verb phrase may have an empty slot for an object), but the pattern itself is an item that may be compared. Barðdal uses the example of the DAT-*is*-*woe* construction in Indo-European languages (English *woe is me*): even though the forms of the word for 'woe', the copula, and the dative pronoun have changed, an analogous construction is found in Latin, Avestan, and most Germanic languages, and so the expression can be reconstructed to proto-Indo-European (Barðdal 2013: 450-454).

Walkden (2014) takes a Minimalist approach to syntactic reconstruction. Unlike Harris and Campbell (1995) and Barðdal (2013), Walkden takes a "mentalist" approach: the object of reconstruction is the speaker's grammatical system, not just the overt syntactic patterns that that system produces (2014: 18). In a Minimalist framework, sentences are derived by combining lexical words with unpronounced "functional heads" that express grammatical meanings. Subtle differences in those functional heads drive variation in word order. Walkden compares his approach to Barðdal's (2013) CG approach in that both are "item-based," offering the historical linguist items to compare across languages: in CG, the items under comparison are schemas with empty slots, while in Minimalism, the compared items are functional heads. He contrasts both approaches with phrase structure grammars or constraint-based grammars, which do not have easily comparable "items" in the same way (Walkden 2014: 56).

In this work, while I do not use a particular formalism, my approach to morphosyntactic reconstruction is very similar to that of Harris and Campbell (1995) and

Barðdal (2013). I focus on reconstructing patterns of language usage rather than the speaker's mental grammar. This process is most relevant in chapter 6, where I reconstruct aspects of the syntactic distribution and argument structure of the proto-Central Mayan *-*ooj/-uuj* infinitive by identifying cognate patterns of usage in the descendant languages. While doing so, I recognize Lightfoot's (2002) point that when two cognate constructions are not identical, there are fewer constraints on what the original state might have looked like. In chapter 6, I highlight those aspects of the *-*ooj/-uuj* infinitive where there is near-identity among the descendant languages (example: in all branches, the infinitive may be followed by a bare noun representing a generic object of the verb), and I acknowledge uncertainty in the reconstruction (and the need for more data) when the descendant constructions show more variation.

Focusing on overt patterns of usage makes it simpler to highlight language-specific structures that are under comparison, rather than filtering them through a particular universal theory of grammar. Pye (2017), introducing his comparative study of child language acquisition in Mayan languages, points out that a main advantage of the comparative method is its ability to hold contexts of use steady across the languages that are being compared. Related languages have more in common, and it is easier to identify points of variation against that backdrop. By contrast, supposedly universal categories may not be comparable between language families. For example, the notion of a "subject marker" is very different between Indo-European and Mayan languages: English and Spanish have a nominative-accusative agreement pattern, where subjects of transitive and intransitive verbs take the same agreement marker, while most Mayan languages have an ergative-absolutive pattern, where transitive and intransitive verbs take an ergative or absolutive subject marker respectively. Many Mayan languages also have split ergativity (or "extended ergative marking"), where intransitive verbs take an ergative subject

agreement marker in certain contexts (normally incompletive or progressive aspect, or the use of temporal adverbs). The inherited similarity between Mayan languages allows the researcher to compare the contexts where extended ergative marking occurs in each Mayan language (Pye 2017: 25-26).[1]

The principle of comparing language-specific contexts of use is relevant throughout this dissertation. As I will outline in section 2.2.2, the most relevant contexts of use for Mayan perfect suffixes are the category of the base (intransitive verbs and two classes of transitive verbs) and voice (active and passive). In focusing on language-specific contexts, I do not wish to downplay the validity of crosslinguistic pathways of change. Rather, I merely emphasize that a historical analysis must be grounded in the unique structures of the languages under consideration. Even if a construction evolves along a crosslinguistically robust pathway, idiosyncrasies of the construction and its place in the larger structure of the language will influence how that change plays out.

[1] Gorrie (2014) makes a similar point about family-specific variables in the realm of linguistic typology. He rejects an approach to typology that tries to generalize facts about the Human Language Faculty from tendencies in extant human languages; research on the language faculty as such is an experimental science, while typology is a historical science, and features attested in extant human languages are a sample limited by historical accident (Gorrie 2014: 55). However, by analyzing typological variation at a smaller scale, considering variables that are relevant within a defined context (Gorrie's "ideal-types," which may be genealogical or areal as well as purely linguistic factors), it is possible to construct analyses that have explanatory power within that context (2014: 157). For example, in a case study of Chinese tone systems, Gorrie quantifies the variation among Chinese languages using family-specific variables: the outcomes of the four ancestral tones inherited from Middle Chinese (2014: 199). As in Pye (2017), the key point is that the most relevant variables for comparison often arise from the local context and inherited structure of the languages being studied, rather than universal categories induced by crosslinguistic comparison.

1.3. LANGUAGE CONTACT

1.3.1. Language contact in language change

Another recurring theme of this dissertation is the effect of language contact on linguistic reconstruction. In the standard tree model of historical linguistics, a single language may split into two or more "branches," representing a speech community that has divided into two, after which both communities' speech evolves independently from one another, often to the point of ceasing to be mutually intelligible. As many scholars have pointed out, tree diagrams oversimplify language change by assuming that each "branch" remains separate after it diverges; language contact, if it occurs, is a secondary process. In reality, a clean break between speech communities is probably the exception rather than the rule, and language contact can radically reshape a language variety (François 2014).

In this work, I assume the standard tree model of Mayan subgrouping (Kaufman 1976; see Figure 1 in section 2.1.1). However, Mayan languages have been in prolonged intense contact with one another for the last two millennia, borrowing numerous words and grammatical features. Mayan languages also show influence from non-Mayan languages such as Zoque, Nahuatl, and (since the 1500s) Spanish (Law 2017b). Prior literature has identified two large-scale zones of contact among Mayan languages: the Lowland Mayan linguistic area (Justeson et al. 1985) and the Huehuetenango Sphere (Barrett 2002).

Contact has influenced the Mayan perfect paradigm to such a scale that it is impossible to discuss the diachrony of the perfect without accounting for contact. The two most notable examples are the widespread passive perfect participle *-b'il* (discussed in sections 4.2.2 and 4.4), which I argue spread areally in the Lowland Mayan linguistic

area, and the transitive perfect suffix *-maj* (chapter 5) which spread through a previously unrecognized contact zone that I term the Sacapulas Corridor. Less widespread suffixes also show the effects of contact: for example, the *-y(aj)* intransitive perfect of Ixil is best understood as a borrowing of the *-iiy* past time suffix found in Ch'olan languages (section 3.1.6).

1.3.2. Morphological borrowing

Because language contact is so relevant to understanding the Mayan perfect, this dissertation also necessarily discusses processes of morphological borrowing. Literature on language contact distinguishes between "matter replication" (also called "transfer of fabric"), the borrowing of overt phonological material such as words or morphemes, and "pattern replication" (or "transfer of pattern") which involves the transfer of abstract structures from the donor language, such as word order or a specific semantic contrast (Heath 1984; Nau 1995; Grant 2002; Heine and Kuteva 2003, 2005; Matras and Sakel 2007; Gardani 2020; Law 2020). These are not mutually exclusive; when a morpheme is borrowed (matter replication), it often brings with it some aspect of its distribution (pattern replication). This dissertation focuses on several instances of matter replication, where the form of a perfect aspect suffix was borrowed through language contact. Section 5.3.2, in particular, highlights an example of matter replication without pattern replication: the *-maj* perfect suffix was borrowed from Poqom, where it was limited to passive voice, into Sakapultek and Sipakapense, which now use *-maj* in active and passive contexts.

Within matter replication of morphology, it is possible to further distinguish between direct and indirect affix borrowing (Weinreich 1953, Winford 2005, Seifart 2015). In indirect borrowing, an affix first enters the recipient language by way of

morphologically complex loanwords that contain that affix. Speakers of the recipient language may later generalize that affix to inherited words in the same language. Direct borrowing occurs when speakers of the recipient language begin using a donor language affix, without loanwords as an intermediary. Direct borrowing requires recipient language speakers to have enough familiarity with the donor language to recognize the affix and its function. Whereas Paul (1891[1880]) considered direct affix borrowing impossible and Weinreich (1953) thought it to be rare, Seifart (2015) argues that it is much more common. Seifart (2015) treats direct and indirect borrowing as endpoints of a scale: for a given borrowed affix, either or both processes may have been active, depending on the level of bilingualism and the number of morphologically complex loanwords that entered the recipient language. I discuss the areal borrowing of the Mayan *-b'il* and *-maj* perfect suffixes at length in section 4.4 and chapter 5 respectively, and I suggest that direct affix borrowing was involved in both cases.

1.4. SEMANTICS OF PERFECT MARKING

While this dissertation focuses on morphosyntactic reconstruction, this section describes the semantics of perfect marking. The basic function of perfect aspect is to indicate that a previous action or state described by the verb has continuing relevance at the reference time (Comrie 1976: 52; Dahl and Hedin 2000). Whereas other aspects such as perfective and imperfective mark an event or state that is salient *at* the reference time—imperfective marks an ongoing event, perfective marks a completed event—perfect aspect differs from the rest in that it looks backwards in time: it "relates some state to a preceding situation"

(Comrie 1976: 52). Bybee et al. (1994) and Schwenter (1994b) use the term "anterior" to refer to the same construction.

Perfect constructions so defined tend to have one of three readings. The "perfect of result" (or "resultative perfect") focuses on a state that holds of an entity as a result of a prior action (1a). The "experiential perfect" ("existential perfect") describes an action that has happened at least once prior to the reference time, without any entailment about the result state; it is often used to describe past experiences of the agent (as in 1b). The "perfect of persistent situation" ("universal perfect") describes a prior state that has continued until the reference time (1c) (Comrie 1976: 56ff; Condoravdi and Deo 2014: 265). Comrie lists a fourth reading, the "perfect of recent past" (also called the "'hot news' perfect") which describes a completed event recent enough to still affect the present. This is distinct from a resultative reading in that the result state of the past event is not necessarily at issue, merely its recency (1d) (Comrie 1976: 60; see also Schwenter 1994a, Dahl and Hedin 2000: 391). Perfect aspect, which is mainly used to give background information on a situation, is distinct from perfective aspect, which describes the completion of an event during the reference time and can be used to advance a narrative (Condoravdi and Deo 2014: 265).

ENGLISH (Condoravdi and Deo 2014: 265; Comrie 1976: 60)

(1) a. Resultative perfect: *John **has put** the cake in the oven.*
b. Existential perfect: *John **has visited** Korea many times.*
c. Universal perfect: *John **has lived** in Korea for the last three years.*
d. Recent past: *Bill **has** just (this minute) **arrived**.*

There is a cross-linguistically robust grammaticalization pathway whereby markers of resultative aspect become generalized as markers of perfect aspect, which in turn evolve to mark perfective aspect (Bybee et al. 1994, Schwenter 1994b, Dahl and Hedin 2000, Schwenter and Cacoullos 2008, Condoravdi and Deo 2014). Condoravdi and Deo (2014) present a case study of the Old and Middle Indo-Aryan suffix *-ta*, which goes through three stages: in Stage 1, the oldest texts, *-ta* has only the resultative reading; in Stage 2, *-ta* gains the existential and universal perfect as possible readings; and in Stage 3, *-ta* can be used as a past tense marker, expressing events in a way that advances the narrative, i.e. perfective aspect (Condoravdi and Deo 2014: 266).

In this dissertation, I focus on morphosyntax rather than semantics, because perfect aspect semantics in Mayan languages is not well understood. In section 2.2.1, I survey meanings that have been recorded for Mayan perfect constructions. The "resultative perfect" appears to be the most common reading of the Mayan perfect, but very few descriptions explore these readings rigorously, and more fieldwork or corpus work is necessary to even begin discussing semantic change.

1.5. DERIVATIONAL MORPHOLOGY

1.5.1. Derivation and inflection

Brown and Hippisley (2012: 37) summarize several characteristics that are normally used to distinguish inflectional and derivational morphology. Among these,

inflectional morphology normally creates distinct forms of a lexeme that are conditioned by syntactic context (e.g., case and person agreement) while derivational morphology creates a new lexeme entirely. Inflectional morphology, because it is so tightly linked to the syntactic context, is usually obligatory, highly productive, and has a transparent meaning. Because derivational morphology creates a different word with a new meaning, it may apply in a more irregular and idiosyncratic way. Spencer (2016: 36), reviewing approaches to inflection and derivation, notes that some models treat inflection and derivation like endpoints on a scale; many morphological constructions have behavior that is canonically inflectional in one way but canonically derivational in other ways. In section 2.2.2, I show that the perfect in most Mayan languages has a mixture of derivational and inflectional characteristics. Mayan perfect participles normally behave syntactically like deverbal nouns or adjectives, making them derivational, but they are highly productive and normally have a very transparent meaning like an inflectional morpheme.[2] The deverbal syntactic behavior of the Mayan perfect strongly figures into my analysis in section 4.4.3 and 6.4, where I claim one common source of Mayan perfect markers is a nominalization that has gained an aspectual meaning over time. The Mayan perfect also forms a paradigm with other deverbal derivational categories, such as agent and action nominalizations. The next section discusses theoretical literature about

[2] See also Haspelmath's (1996) paper on "word-class-changing inflection," where he explains the partially inflectional and partially derivational behavior of participles by stating that they are verbal with respect to their "internal syntax" (i.e. argument structure) and adjectival with respect to their "external syntax" (i.e. the way they relate to larger constituents of the sentence). I leverage the "internal/external syntax" distinction in chapter 6 when discussing the behavior of the *-*ooj*/-*uuj* infinitive.

derivational paradigms, while section 2.3 in the next chapter overviews the derivational paradigm of Mayan languages.

1.5.2. Derivational paradigms

Word-and-Paradigm models of morphology, often called inferential-realizational models, emphasize the primacy of paradigms and the relationships between word-forms in a paradigm (e.g., Zwicky 1985; Anderson 1992; Stump 2001, 2015; Brown and Hippisley 2012; Spencer 2013). These models assume an opposition between distinct members of a paradigm: unique combinations of features such as "1st person singular indicative future" or "2nd person plural indicative future" form distinct cells in the paradigm, and the role of morphology is to express how these combinations of features are realized phonologically. While most work in the Word-and-Paradigm family of theories has focused on inflectional morphology, some have made the case that derivational morphology (normally considered more idiosyncratic and less paradigmatic than inflectional morphology) can be analyzed paradigmatically as well (for a review of the relevant literature see Štekauer 2014).

Bybee et al. (1994) reject the idea that grammar is based on opposition. Instead, they state that language is built on "substance" (that is, the positive meaning associated with single constructions), and that paradigmatic relationships between forms are epiphenomenal (Bybee et al. 1994: 1). A language may have more than one construction filling a given "slot" in the paradigm: the English expressions *will*, *shall*, and *be going to*

all convey future tense, while *must, have to,* and *got to/gotta* all express obligation. Even though these expressions have subtly different usage, they are interchangeable in many situations, evidence that language does not maintain maximal contrast between expressions as a strict paradigm-based model would predict (Bybee et al. 1994: 21-22).

In this dissertation, I use derivational paradigms primarily as a way to organize data visually. I do not invoke any particular Word-and-Paradigm theoretical framework here, nor am I committed to the idea that morphemes with similar meanings in a language must somehow be in opposition. Indeed, in the data presentation in Table 8 and throughout this dissertation, a given cell often lists multiple distinct morphemes. However, the reality of paradigms deserves further investigation through the lens of Mayan languages, perhaps within a particular Word-and-Paradigm formalism. As I will discuss in section 2.3.1, many changes to Mayan perfect suffixes are best understood in relationship to the perfect paradigm as a whole: Chuj extended the perfect marker **-naq* from intransitive to transitive verbs, while Poqom innovated a morphological contrast between the active and passive perfect that had previously only been marked syntactically. Because the paradigmatic behavior of Mayan derivational morphology is so relevant to understanding morphological change, future work on Mayan languages is in a good position to address the broader question of the role of paradigms in human language.

Chapter 2: Mayan languages

2.1. OVERVIEW OF MAYAN LANGUAGES

2.1.1. Family tree of Mayan languages

Mayan languages are primarily spoken in modern-day Guatemala, Belize, and southern Mexico. More recently, diasporic communities have arisen in major cities in the United States. There are approximately 30 extant Mayan languages, depending on what varieties are considered languages or dialects. A family tree of Mayan languages is given in Figure 1 and a map of their present-day locations in Figure 2.

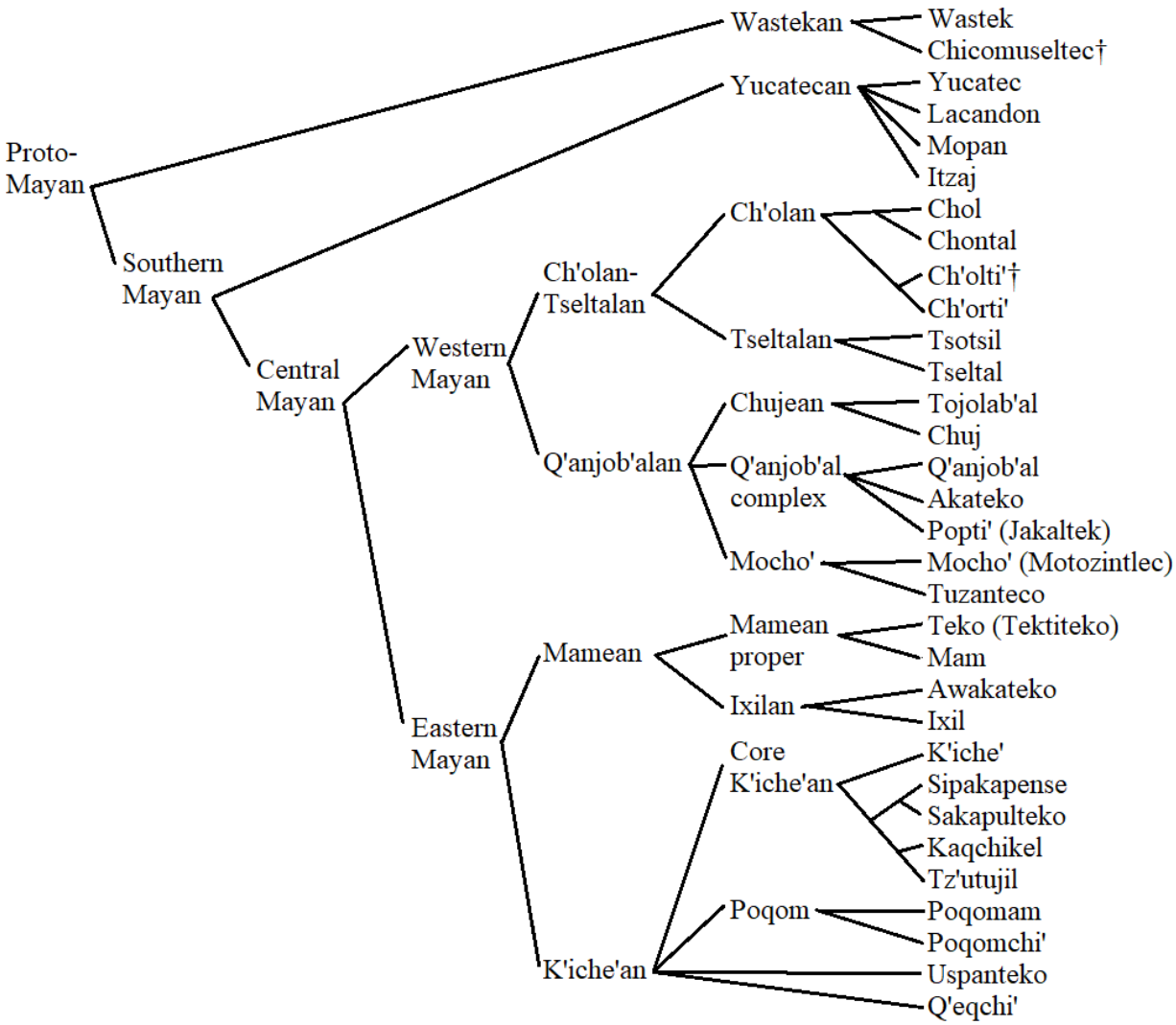

Figure 1: Family tree of Mayan languages, after Kaufman (2017), with minor changes to subgroup names. Internal organization of Core K'iche'an modified after DuBois (1981: 34). Daggers (†) indicate extinct languages.

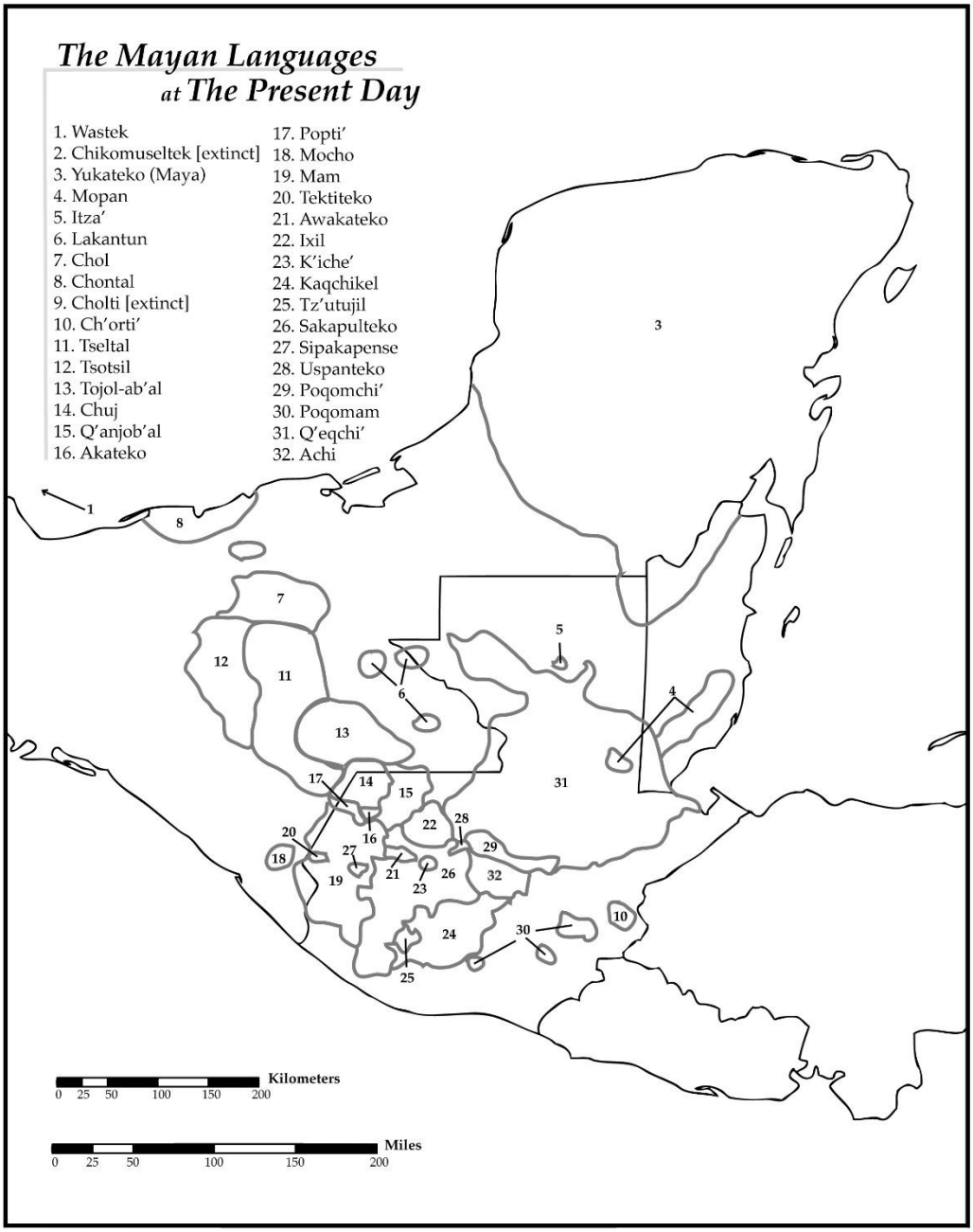

Figure 2: Map of present-day locations of Mayan languages. From Law (2014: 25).

Until recently, there has been debate about the genealogical classification of Tojol-ab'al, as it shares many features of both Tseltal and Chuj (summarized in Law 2017b: 120-121). Historically, scholars have placed Tojol-ab'al either in a subgroup with Tseltal and Tsotsil (McQuown 1955, 1956; Robertson 1977; Campbell 1988) or as a close relative of Chuj (Kaufman 1974, 1976a, 2017; Schumann 1981, 1983; Campbell and Kaufman 1985; Dakin 1988). Law (2017a) and Gómez Cruz (2017) argue that Tojol-ab'al is a Chuj-Tseltal mixed language, which is the analysis that I assume here. For simplicity in organizing data, I list Tojol-ab'al with Q'anjob'alan languages, while recognizing that many of its features come from Tseltalan.

"K'iche'" in Figure 1 actually includes two varieties, K'iche' and Achi. These are spoken by two culturally distinct groups and are officially considered separate languages, but they are mutually intelligible, and Achi varieties are often considered part of the eastern dialect area of K'iche' (Par Sapón and Can Pixabaj 2000: 17). Similarly, "Awakateko" includes Awakateko and Chalchiteko, which are officially separate but linguistically nearly identical (England 2003: 740; Campbell 2017: 45). Many of the descriptive resources I cite here cover K'iche'/Achi or Awakateko/Chalchiteko together, but I also reference sources specifically about Achi and Chalchiteko for completeness (see section 2.4 and the Appendix on sources).

Various scholars have estimated the time depth of the Mayan family. Swadesh (1961) used glottochronology to estimate that the Mayan languages diverged between 3,600 and 5,400 years before present (1600-3400 BC). Kaufman (1976a), also using glottochronology, estimated a time depth of 4,200 years before present (2200 BC); his is

still the most-cited estimate in Mayan linguistics and archaeology. Atkinson (2006: 6.18), using Bayesian phylogenetic methods, estimated an older divergence date of 6,000-6,500 years before present (4000-4500 BC), albeit with large error bars (95% confidence interval from 4,000-9,000 years before present). Since all of these are statistical estimates, none are definitive.

At least one Mayan language is directly attested in hieroglyphic inscriptions from before the Spanish conquest, largely from the Classic Period. The language of the hieroglyphs is referred to as Classic Mayan and is most often identified as a member of the Ch'olan subgroup. Some scholars (such as Houston et al. 2000) identify Classic Mayan as a common ancestor of the Eastern Ch'olan languages (Ch'olti' and Ch'orti'), while others (such as Mora-Marín 2009) identify Classic Mayan as proto-Ch'olan.

In addition, a few manuscript sources in Latin script were produced in the colonial period after the Spanish conquest. These mostly include grammars, dictionaries, and doctrinal works written by Spanish priests, but also a few works produced by native speakers, most famously the Popol Vuh creation narrative written in K'iche' (Christenson 2007) and the Yucatec Maya Chilam Balam (Barrera Vásquez and Rendón 1948).

2.1.2. Setting and history

The Mayas are part of a larger cultural and linguistic area, Mesoamerica, which spans most of Mexico and Central America and includes other language families such as Oto-Manguean, Mixe-Zoquean, and Uto-Aztecan, as well as smaller families such as

Totonacan, Xincan, and Lencan, and numerous language isolates. The history of Mesoamerica before the Spanish conquest is normally divided into three major periods (Law 2014: 11):

- Preclassic (2000 BC-200 AD)
- Classic (200-900 AD)
- Postclassic (900-1500 AD)

The exact date ranges vary by the author; Coe and Houston (2015: 26) place the Preclassic/Classic and Classic/Postclassic cutoffs at 250 AD and 800 AD respectively.

The following discussion largely follows Coe and Houston (2015), except where otherwise noted. After the domestication of maize in central Mexico, the Preclassic saw the expansion of agriculture and, consequently, of highly populated villages. The Olmecs, a non-Maya civilization of southern Mexico who likely spoke a Mixe-Zoquean language, were among the first to build stone temples and monuments. They were also among the first to use hieroglyphic writing and calendric inscriptions, precursors to the inscriptions that became ubiquitous across the Maya area a few centuries later. According to glottochronological estimates (Kaufman 1976a), this period saw the diversification of the Mayan language family into many descendant branches (Figure 1 below) and the growth of Maya cities.

By the early Classic period, the Mayas had major cities which exerted strong political sway over the region. The vast majority of the extant stone architecture and

hieroglyphic inscriptions date to the Classic Period. The hieroglyphs are written in a Ch'olan language (see section 2.1.1 above). From about 800-900 AD, leading into the Postclassic, the Classic Maya civilization began to collapse, due to a combination of warfare and environmental factors. Power shifted to the Yucatán Peninsula in the north, at sites such as Chichen Itzá and Mayapan (an area inhabited by Yucatec Maya speakers), and southward to what is now highland Guatemala, the kingdoms of the K'iche', Kaqchikel, Poqom, Mam, and other groups speaking Eastern Mayan languages.

The Postclassic ended in the early 1500s when Spanish conquistadors invaded Mesoamerica, systematically dismantling Maya social structures and imposing Spanish political authority. The conquistadors were quickly followed by Catholic priests (largely from the Dominican, Franciscan, and Jesuit monastic orders) who forcibly converted much of the Indigenous population to Christianity. Through the 1700s and 1800s, several Mayan communities across Guatemala and southern Mexico revolted against Spanish control (Bricker 1981, Patch 2002). In 1978, during the Guatemalan Civil War, the Guatemalan national army began a systematic genocide of Maya communities whom they accused of being allied with Communist guerrillas, killing over 200,000 people and displacing hundreds of thousands more by the end of the 1980s (United Nations Commission for Historical Clarification 1997; Coe and Houston 2015: 299). Beyond the tragic loss of life, the lasting repercussions of colonialism and genocide on Maya communities, culture, and languages cannot be overstated.

Since the early 1980s, language activism in Maya communities has led to widespread efforts for language revitalization and documentation. Mayan languages are

now being promoted in Guatemalan schools, albeit not with the same resources allocated to Spanish (England 2003, 2018). Despite this, in the modern day, Maya communities are still undergoing widespread language loss as a result of increasing globalization and the encroachment of Spanish (and, more recently, English). In some Maya communities, language transmission is robust, with most children acquiring the language. However, this is becoming something of an outlier. In Maya communities where I have personally stayed, most people under 30 speak predominantly Spanish, and the youngest children may or may not learn a Mayan language at all. While some of the larger languages such as K'iche', Q'eqchi', and Yucatec have hundreds of thousands of speakers each, some languages, such as Itzaj and Mocho', have only a few dozen elderly speakers left.

2.1.3. Typological characteristics

Mayan languages share several general characteristics. This section describes a few features that are relevant for the dissertation as a whole, drawing heavily from the overview in Aissen, England, and Zavala (2017: 5-8) except where otherwise noted.

2.1.3.1. Phonology

The Proto-Mayan phoneme inventory is given below in the International Phonetic Alphabet. Table 1 shows consonants while Table 2 shows vowels. All Mayan languages have a contrast between plain and glottalized stops (and affricates). Glottalized consonants are generally ejective except for bilabial /ɓ/. Most Mayan languages contrast

five vowel qualities, and many have a vowel length distinction. I will discuss individual sound changes between proto-Mayan and modern Mayan languages as needed, when it affects a morphological change.

	Bilabial	Alveolar	Palatalized alveolar	Post-alveolar	Palatal	Velar	Uvular	Glottal
Stop	p ɓ	t t’	tʲ tʲ’			k k’	q q’	ʔ
Affricate		ts ts’		tʃ tʃ’				
Fricative		s		ʃ			χ	h
Nasal	m	n				ŋ		
Trill		r						
Approximant	w	l			j			

Table 1: Consonant phonemes of Proto-Mayan, after Campbell (2017: 46).

	Front	Central	Back
High	i iː		u uː
Mid	e eː		o oː
Low		a aː	

Table 2: Vowel phonemes of proto-Mayan, after Campbell (2017: 46).

The following orthographic conventions are in common use by Mayan speakers and Mayanist literature (largely following the guidelines of Instituto Indigenista Nacional 1988). Unless otherwise specified, all other symbols have the same values as in IPA.

Nearly all languages:

- *b'* = /ɓ/
- *ch(')* = /tʃ(')/
- *j* = /χ/, /x/, or /h/ depending on the language
- *tz(')* = /ts(')/
- *x* = /ʃ/ (some languages have /ʂ/)
- *y* = /j/
- *'* (apostrophe) = /ʔ/
- *VV* (double vowel) = /Vː/

More limited use:

- *ä* = /ə/ (sometimes realized as [ɨ])
- *ë, ï, ö, ü* = /ɛ, ɪ, ɔ, ʊ/ (Kaqchikel)
- *nh* = /ŋ/
- *ñ* = /ɲ/ (Chol)
- *tch* = /tsʃ/ ("alveo-postalveolar affricate" in Chajul Ixil; see Adell 2019: 62)
- *th* = /θ/ (Teenek)
- *tx* = /tʂ/ (*tx* = /tʃ/ in some Mocho' sources; see Pérez González 2021: 41)
- *ty* = /tʲ/
- *xh* = /ʃ/ (in languages where *x* = /ʂ/)

In this dissertation, when phonology is not at issue, I default to the practical orthography for each language, but I include IPA as necessary for clarity. When citing colonial sources, if the correspondence to the modern orthography is not transparent, I include the original orthography in angle brackets < >.

2.1.3.2. Syntactic categories

Mayan languages distinguish several classes of roots: nouns, verbs, adjectives, adverbs, prepositions, and grammatical particles, as well as positionals and affect roots which are Mayan-specific categories. Positional roots indicate the shape or position of a referent (sometimes with remarkable specificity), while affect roots tend to be sound-symbolic.

These are distinguished from each other and from verbs by their morphological behavior. Positional and affect roots always take special derivational morphology to turn them into verbal (eventive) or non-verbal (stative) predicates. I will not be covering positional and affect roots in depth in this dissertation, but there are a few cases where a stative participle suffix normally used with positional roots was extended to verbs: *-a'an* in Yucatecan languages (section 3.1.3) and *-Vl* in Ch'olan-Tseltalan languages, Ixil, and Uspanteko (section 4.2.4).

Transitive and intransitive verbs have distinct morphological and syntactic behavior, to the point that they should probably be considered separate syntactic categories. In addition, for both transitive and intransitive verbs, most Mayan languages have a morphological class distinction between roots (generally CVC) and verbs derived from other sources. "Root transitive verbs" (RTV) and "derived transitive verbs" (DTV) in particular often have distinct allomorphs of derivational morphemes: in the following examples from K'iche', the root transitive verb *b'an* lengthens its root vowel in passive voice, while the derived transitive verb *q'oyob'a'* (from a positional root *q'oy* 'lying down') takes the passive suffix *-x*. Further, in most Mayan languages, verbs take a "category suffix" (sometimes called a "status suffix") that indicates what category the verb belongs to. The root *b'an* 'do' in (1a) takes the root transitive category suffix *-o*, while the intransitive stems in (1b) and (2b) take the suffix *-ik*. The derived transitive stem in (2a) does not take a separate category suffix, though some DTV stems in K'iche' do.

K'ICHE' (Larsen 1988: 251-253)

(1) a. *x-Ø-uu-b'an-o*
COM-B3S-A3S-do-RTV.SUF
's/he did it'

b. *x-Ø-**b'aan**-ik*
COM-B3S-do.PAS-IV.SUF
'it was done'

(2) a. *x-Ø-uu-q'oy-ob'a'*
COM-B3S-A3S-lying-CAUS
's/he left him/her/it in a lying position'

b. *x-Ø-q'oy-ob'a-**x**-ik*
COM-B3S-lying-CAUS-PAS-IV.SUF
'he/she/it was left in a lying position'

2.1.3.3. Predicate types

Mayan languages have two types of predicates: verbal and non-verbal. Verbal predicates may be headed by transitive or intransitive verbs (as in 1-2 above), while non-verbal predicates can include nouns, adjectives, and other content words. Non-verbal predicates are sometimes called "stative predicates" and indicate equivalence or a quality of the subject, as in (3-4). They are not typically marked for aspect, but they may take person agreement. In (3), *kunaneel* 'doctor' is the predicate, and the absolutive person marker *in* references the subject. In (4), the positional predicate *ketekik* 'disc-shaped' acts as a non-verbal predicate, while its subject is *ri xoot* 'the comal'.

K'ICHE' (Larsen 1988: 106, 297)

(3) *in* *kun-an-eel*
B1S heal-AP-AGT
'I am a doctor.'

(4) *Ø* *ket-ek-ik* *ri* *xoot*
B3S discoid-ADJ-SUF the comal
'The *comal* is disc-shaped.'

2.1.3.4. Morphological typology

Mayan languages are highly synthetic and head-marking. Verbs show agreement with their subject (and object, if transitive). Most Mayan languages are ergative-absolutive: subjects of intransitive verbs and objects of transitive verbs are marked using absolutive person agreement markers ("Set B" in Mayanist literature) while subjects of transitive verbs are marked with ergative agreement markers ("Set A"). Some Mayan languages have an ergative split, where the intransitive verb will receive a Set A marker in a given grammatical context (incompletive or potential aspect, non-third person, or certain subordinate clauses). Derivational morphology is typically marked by suffixes. Inflectional morphology is sometimes marked by suffixes, but most often by prefixes or clitics.

2.2. THE PERFECT

The perfect is a ubiquitous category within Mayan languages and plays an important role in the verb paradigm. In Mayan languages, the perfect generally describes the state that results from a prior action. Morphosyntactically, perfect constructions often appear as non-verbal predicates, but some Mayan languages can additionally use them as adjectives attributively modifying a noun, or as patient nouns (nouns referring to an entity affected by the action). In other Mayan languages, the perfect acts much more like a verbal predicate and cannot appear as an adjective or noun.

Section 2.2.1 briefly discusses the semantics of perfect aspect in Mayan languages, while in section 2.2.2, I overview the morphosyntactic behavior of the Mayan perfect. Section 2.3 below discusses how the perfect fits into the larger derivational paradigm of Mayan languages.

2.2.1. Perfect semantics in Mayan languages

The diachrony of perfect semantics in Mayan languages is beyond the scope of this dissertation. With the exception of a few relatively well-studied Mayan languages such as K'iche' and Yucatec, there is not much semantic description of Mayan languages, nor is there the same time depth of continuous historical attestation as for the Indo-Aryan languages in Condoravdi and Deo's (2014) study (see section 1.4). Any family-wide comparison of aspectual semantics would require extensive fieldwork and/or corpus work in each Mayan language; in fact, discussing the aspectual system of one Mayan language

synchronically would require enough original research to fill a whole dissertation by itself. However, for sake of discussion, it is worth briefly surveying meanings that have been described across the family. I illustrate here with examples from Teenek, Ixil, and K'iche'.

Kondić states that the Teenek perfect suffixes *-eenek* and *-aam* can express the resultative perfect, existential ("experiential") perfect, and recent past, but not the universal perfect ("persistent situation") (Kondić 2012: 116). She does not provide examples to distinguish these readings; all the examples of the *-aam* perfect that she provides, such as (5), are consistent with a resultative meaning.

TEENEK (SOUTH EASTERN) (Kondić 2012: 205)

(5)	*an*	*kwita'*	*ch'a'-y-**aamej***	*(k'aal*	*na*	*Josee)*
	DEF	chicken	buy-TV-PERF.PAS	with	HUM	José
	'The chicken has been bought (by José)'					

Kondić gives one example of the intransitive perfect *-eenek* that is translated with a universal perfect (persistent situation) reading (6), seemingly contradicting her statement that *-eenek* lacks this reading. It is worth noting that the *-(V)n* middle voice suffix, used with the emotion predicate in (6), can elsewhere indicate a change of state or position (Kondić 2012: 220-221), and so it is possible that (6) literally means something more like "He is saddened," a resultative reading.

TEENEK (SOUTH EASTERN) (Kondić 2012: 232)

(6)	*t'e'p-in-**eenek***	*an*	*ti*	*k'waj-at.*
	be.sad-MID-PERF	DEF	SUB	be-INC

'He has been very sad.'

Adell, writing about the Ixil perfect markers *-l(a')* and *-y(aj)*, states that they "indicate that the time for which an assertion is made is in the post-state of the event indicated by the verb with which they combine" (2019: 268). In the model of aspectual semantics that Adell uses, borrowed from Bohnemeyer (2014), "post-state" refers to the state resulting from the action of the verb, but for verbs that do not denote a change of state, this boils down to linear precedence on a timeline.[3] In other words, in the broadest sense, the perfect describes an event that occurred prior to the reference time (Bohnemeyer 2014: 920; Adell 2019: 460). In Ixil, Adell does not distinguish the resultative, existential, or universal perfect readings as defined by Condoravdi and Deo (2014). As an extra layer of complexity, *-l(a')* and *-y(aj)* can co-occur with the TAM proclitic *qat=* 'cessive aspect', which marks an event that ends during the reference time (Adell 2019: 460).

Bolles and Bolles describe the Yucatec *-maj* and *-a'an* perfect suffixes as indicating "past action—continuing purpose" and state "the actual action is completed, but the purpose for which the action was performed continues" (2014: 79). This fits with the general "continuing relevance" definition of the perfect, and their examples specifically show the "resultative perfect" reading, in that the state resulting from the action still holds at the reference time (the finished garden in 7, the person's absence in 8).

[3] "[A]ll events are assumed to be…followed by result states, although verbs and other lexical event descriptors *may not refer to those states* unless the description in question is in fact a state change description" (Bohnemeyer 2014: 920, my emphasis). Bohnemeyer treats the existential/experiential reading of the perfect ("the agent has Verbed at least once") as a special case of the resultative perfect, where the result state is the agent's life after the new experience (2014: 929, footnote 9).

YUCATEC (Bolles and Bolles 2014: 79, 88)

(7) *U* *b'et-maj* *u* *kol*
A3S make-PERF A3S field
'He made his garden and is using it'

(8) *Hok-aan-Ø.*
leave-PERF-B3S
'He came out and has stayed out.'

Larsen notes that K'iche' perfect participles can roughly be translated using the English perfect aspect. The K'iche' perfect does not have any entailment about tense, and so the context determines whether it is best translated as a present, past, or future perfect (Larsen 1988: 185). He does not elaborate on more fine-grained aspectual readings within the perfect, but he does note that sentences such as (9) can be translated either with the perfect reading "they have died" or the stative "they are dead."

K'ICHE' (Larsen 1988: 186)

(9) *e'* *kam-**inaq***
B3P die-PERF
'they have died; they are dead'

Because death is a resultant state of dying, these two translations may not actually represent distinct readings; both are consistent with "resultative perfect" in the terminology discussed above. From Larsen's discussion, it is not clear whether (9) could be used in a context that forces an existential perfect reading, such as "I have died three times (but have been revived every time and am now alive)" which only entails the prior dying event and negates the result state.

My general impression, based on the examples I have encountered in the course of this project, is that the resultative perfect is the most common reading of "perfect" markers across the family. That is, their primary purpose is to describe a state resulting from a prior event, rather than focusing on the event itself or a persisting situation as is the case with the existential or universal perfect. However, I have not quantified this intuition. Perfect semantics warrants fuller investigation in all Mayan languages.

2.2.2. The morphosyntax of perfect marking in Mayan

As discussed in section 1.5.1, many linguists distinguish derivational morphology, which creates a new word from a base, from inflectional morphology, which merely adds grammatical information to an existing word. Other linguists treat inflectional and derivational morphology as a spectrum, where a given morphological category may exhibit more inflectional or derivational characteristics; I assume this view here. Perfect constructions in Mayan languages generally behave like derivational morphology, though they have some inflectional characteristics, and the extent to which the perfect behaves as an inflectional or derivational category varies across Mayan languages. Broadly speaking, Mayan perfect morphemes are usually fairly productive and have a consistent, transparent meaning, both of which are canonically inflectional characteristics. Perfect constructions are derivational to the extent that they behave syntactically as deverbal forms such as nouns or adjectives. In some languages, the perfect is an adjective (a "perfect participle") that can modify a noun, which expresses the state of that noun as a result of the verbal

action. The same form can often be used either as a predicate or attributively modifying a noun within a noun phrase (as with *-naq* in examples 11 and 15 below from K'iche'; cf. English *The soldiers have **fallen***, predicative, vs. *the **fallen** soldiers*, attributive). Many Mayan languages also allow perfect forms to behave as nouns (20 below).

A complicating factor is that adjectives and nouns in Mayan languages can behave as non-verbal predicates, with no copula, as in (3) above and (10) below. Even if a perfect form is used as a predicate, as in (11) (which is syntactically parallel to 10), this is still consistent with the idea that the perfect is syntactically a deverbal form, even if the meaning it contributes is an aspectual modification of a verbal base.

K'ICHE' (Larsen 1988: 138, 186)

(10) *nim* *ri* *keej*
big the horse
'The horse is big'

(11) *war-inaq* *ri* *ak'aal*
sleep-PERF the child
'The child is sleeping' (lit. 'The child has fallen asleep')

In fact, in most Mayan languages, it is probably better to consider the perfect a non-verbal predicate than a verbal predicate, as it lacks the TAM proclitics seen on other verbal predicates (12).

K'ICHE' (Larsen 1988: 426)

(12) ***k**=in=war-ik* *are taq* ***x**=at=ul-ik*
INC=B1S=sleep-IV.SUF when COM=B2S=arrive.here-IV.SUF
'I was sleeping when you arrived.'

Adjectival roots in Mayan languages can also be used attributively within a noun phrase, modifying the head noun. In K'iche', attributive adjectives precede the head noun and take an attributive suffix (normally *-a* as in (13), but sometimes *-i* or a different vowel; Larsen 1988: 134). Adjectives can also follow the noun in K'iche', in which case they lack the attributive suffix (14); Larsen analyzes these as relative clauses (i.e. 'flower which is yellow'), an analysis which is possible because K'iche' has no "to be" verb (Larsen 1988: 135).

K'ICHE' (Larsen 1988: 134-135)
(13) *q'an-**a*** *kootz'i'j*
yellow-ATTR flower
'white blanket'

(14) *kootz'i'j* *q'an*
flower yellow
'yellow flower' or 'flower which is yellow'

K'iche' can use perfect forms attributively, as shown in (15) and (16) from K'iche', but these do not take the attributive suffix. Note that the perfect participle of a transitive verb in (16) has a passive reading when it attributively modifies a noun. Similarly, Yucatec can use the passive perfect participle *-b'il* attributively (17).

K'ICHE' (Larsen 1988: 187, 235)
(15) *jun* *kam-inaq* *tz'i'*
one die-PERF dog
'a dead dog'

(16) *tzak-om* *saqmo'l*
cook-PERF egg
'boiled egg'

YUCATEC (Bolles and Bolles 2014: 53)
(17) *tz'a* *t-en* *tzaj-b'il* *je*
give PREP-B1S fry-PERF egg
'Give me fried eggs.'

Poqomchi' perfect participles in *-naq* may be followed by the *-laj* intensifier that occurs with attributive adjectives:

POQOMCHI' (Mó Isém 2006: 99, 214)
(18) *Naj* *kam-naq-**laj*** *tz'i'* *Ø-Ø-ki-req* *pan* *b'eeh.*
one die-PERF-TNS dog COM-B3S-A3P-find PREP road
'They found a dead dog on the road.'

(19) *Mama'-**laj*** *winaq* *i* *r-ajaaw.*
big-TNS man ART A3S-father
'His/her father is a big man.'

Example (20) shows the K'iche' *-oom* perfect participle acting as a patient noun, referring to the entity affected by the action of the verb.

K'ICHE' (Larsen 1988: 236)
(20) *nu-mok-**oom***
A1S-ask.for.the.services.of-PERF
'my servant' (lit. 'my one-whose-services-have-been-asked-for')

For languages where the perfect behaves as a prenominal attributive modifier or as a referential noun, it is strong evidence that speakers of those languages treat the perfect as a derivational category. The deverbal nature of the perfect is a major component of my

analysis in section 4.4.3, where I claim that the proto-Mayan **(-o)-'m* perfect is underlyingly based on a patient noun. In some languages, however, the perfect appears exclusively as a predicate. For example, I have not observed the *-aam* perfect of Teenek (a reflex of **(-o)-'m*) acting as an attributive adjective or referential noun. In this case, it may be more appropriate to say that the Teenek *-aam* perfect came *from* a derivational morpheme historically, since there is no evidence to consider it synchronically derivational.

2.3. DERIVATIONAL PARADIGMS IN MAYAN

2.3.1. Use of derivational paradigms

In section 1.5.2, I discussed the concept of paradigms. In a paradigm-based model, the identity of a morphological category is defined largely by its opposition to other categories. For example, English contrasts singular and plural number, while (many) Semitic languages contrast singular, dual, and plural number; the contrast between dual and plural is a relevant contrast for Semitic languages but not English. Linguists disagree on whether paradigms are fundamental to how human languages work or if they are merely a byproduct of comparing two or more elements with a similar function: someone who rejects paradigms would say that English simply has two (separate) morphological categories expressing number, and the seeming contrast between them is a natural effect of their difference in meaning.

In this dissertation, while I sidestep the theoretical question of whether paradigms are fundamental or epiphenomenal to human language, I find derivational paradigms useful as a way of organizing data. Further, many of the historical changes I discuss in this work are best explained by the relationships among suffixes in the context of a whole paradigm. For example, Chuj extended the perfect suffix *-*naq* from intransitive verbs to active transitive verbs. Active transitive verbs in the Q'anjob'alan subgroup previously lacked a perfect suffix, and so this can be seen as filling a cell of the paradigm that was previously empty (section 3.1.1.2). Similarly, in chapter 5 I show that while proto-K'iche'an used *-*oom/-uum/-m* for perfect aspect in both active and passive contexts, Poqom added the passive suffix *-*aj* to the passive perfect participle, creating -*(V$_R$)m-aj*. Viewing this change locally, one could say that it only directly affected the passive perfect participle; nevertheless, its global effect in the language was to reinforce the contrast between the -*(V$_R$)m* active perfect and -*(V$_R$)m-aj* passive perfect participle (which were previously only distinguished by person agreement). For this reason, as I discussed in section 1.5.2, it would be fruitful in future work to investigate Mayan derivational morphology through the lens of a particular paradigm-based formalism: doing so could shed light both on Mayan languages in particular and on the nature of morphology in general.

2.3.2. Prior work on Mayan derivational paradigms

I turn now to prior analyses of the verb paradigm in Mayan languages and where perfect constructions fit. Kaufman's (1990) overview of the structure of Mayan languages establishes what he terms "status suffixes," which attach to verbs to indicate mood and occasionally aspect (1990: 71). His paradigm of K'iche' "status suffixes," shown in Table 3, shows three categories: "plain," "dependent," and "perfect." "Plain status" generally correlates with indicative mood and can occur with completive, incompletive, and potential TAM proclitics; elsewhere in Mayanist literature, these are often called "category suffixes" because their main role is to distinguish verb classes from one another. "Dependent status" often marks a subordinate clause or conveys irrealis mood, and can occur with optative or imperative TAM proclitics. "Perfect status" exclusively represents perfect aspect and does not take an overt TAM proclitic.

	IV	RTV	DTV in *-V*	DTV in *-b'a'*	DTV in other *-a'*
plain	*(-ik)*	*(-oh)*	*-V_1j*	*Ø*	
dependent	*-a/(-oq)*	*-a'*			
perfect	*-inaq*	*-oom*	*-V_1m*	*aa]-m*	*o']-m*

Table 3: The paradigm of K'iche' "status suffixes" according to Kaufman (1990: 72). A right bracket] indicates that the preceding vowel replaces the stem vowel.

The "perfect status" label is replicated in many descriptions of Mayan languages, though more recent work is beginning to separate the perfect from the status suffix paradigm:

Vinogradov, for example, lists only "plain" and "dependent" status in Poqomchi' (Vinogradov with Juc Toc and Xol 2016: 173).

Kaufman contrasts "perfect status" with a deverbal derivational category that he calls the "perfect participle" (which is normally passive). In his (1990) overview, he aligns passive perfect participles with "stative" derivations of positional roots, as shown in Table 4.

	Causative	*Process*	*Stative*
Adjective, Noun	*-ar-isa* 'conversive'	*-ar* 'versive'	
IV	*-isa* 'causative'		*-inaq* 'intransitive perfect participle'
TV		*-h/-x* 'middle voice'	*-oom* 'passive perfect participle'
Positional	*-V_Rb'a'* 'depositive'	*-e'* 'assumptive'	*-V_Rl* 'stative'

Table 4: Derivational suffixes in K'iche', according to Kaufman (1990: 103).

In later work, Kaufman treats perfect participles as part of a paradigm with "gerund" suffixes. This pairing makes sense insofar as participles and gerunds are often diachronically related (as with the **-ooj/-uuj* nominalizing suffix in chapter 6). In Kaufman's proto-Mayan reconstruction, he combines the two categories into a single "participle/gerund" category, as shown in Table 5. The label "participle/gerund" is meant to convey that each suffix in the table could carry out the function of either a participle or

a gerund in proto-Mayan, and that both functions are represented across the modern reflexes of each suffix.

	RTV [Active]	DTV [Active]	IV	Passive
incompletive	**-o-al*	**-al*	**-e-al*	
perfect	**-o-ej*	**-ej*	**-e-'m*	**-b'il*

Table 5: Derivational paradigm of proto-Mayan "participle/gerunds" per Kaufman (2015: 319).

One major difference from the K'iche' derivational paradigm in Table 4 is that in Table 5, Kaufman claims proto-Mayan had an "active perfect participle" in addition to the "passive perfect participle." Both of these derivational categories contrast with the "perfect status" inflectional category, which is always in active voice and patterns with other status suffixes as shown in Table 6.

	RTV	DTV	IV
plain	**-o-h /_# ~ *-o-w*	**-h* or **-V*	**-i(-k) ~ *-i-h*
imperative	**-a-h /_# ~ *-a-w*	**-Vnh*	**-e-Vn* **-Ø* with AP
dependent	**-a-'*	**-Vnh*	**=oq*
perfect	**-o-'m*	**-'m*	**-i-naq*

Table 6: Status suffixes of proto-Mayan, according to Kaufman (2015: 278-279).

Table 5 and Table 6 are well-organized, but the analysis they represent has major problems. Most importantly, it claims that proto-Mayan transitive verbs had two different

types of active perfect construction: an active "perfect status" marker and an "active perfect participle/gerund." No Mayan language has such a contrast. Ixil contrasts a perfect aspect marker *-l(a')* with nonverbal "stative resultative participles" *-el* and *-mal*, but the latter occur in exclusively passive contexts (Adell 2019: 269, 444-447).

Kaufman labels **(-o)-ej* as an "active perfect participle-gerund" mainly based on its reflexes, which include perfect constructions in Tseltalan, Tojol-ab'al, and Poqom, and action nominalizations in many other languages. In chapter 6 I argue that this suffix originally created action nominalizations and was reanalyzed as a perfect marker in Poqom and Tseltalan (and by extension Tojol-ab'al, a Tseltal-Chuj mixed language per Law 2017a). My analysis removes the need to have a separate proto-Mayan "active perfect participle/gerund" competing with "perfect status."

Similarly, for intransitive verbs, almost none of the modern Mayan languages distinguish an inflectional "perfect status" from a derivational "perfect participle." Ixil, again, is a major exception, where a perfect aspect marker *-y(aj)* contrasts with a deverbal "stative resultative" participle *-na'q* (Adell 2019: 269, 444). *-y(aj)* is clearly innovative (section 3.1.6), so this does not provide evidence for such a distinction in proto-Mayan.

Contrary to Kaufman, I treat the Mayan perfect as fundamentally a derivational category, creating a deverbal form that can appear as the nucleus of a non-verbal predicate, but it has gained more inflectional characteristics in some languages. A given suffix may exhibit more canonically inflectional or derivational behaviors depending on the language, as discussed above in section 2.2.2. Because of this, I do not find "perfect status" and "perfect participle" useful as basic categories for a cross-Mayan comparison.

Instead, I focus on contexts of use that are more straightforward to compare: base attachment (the type of stem the suffix attaches to) and voice (active or passive). The next section describes these contexts of use and shows how the paradigm varies across Mayan languages.

2.3.3. A model of Mayan derivational morphology

Cross-linguistically, derivational morphology tends to be much less productive and more idiosyncratic than inflectional morphology (Brown and Hippisley 2012: 37). This is also true of Mayan languages. However, several deverbal categories such as nominalizations and perfect participles are consistently marked across the family, often in a highly regular way that belies their derivational nature. Table 7 shows a model that I propose for the Mayan derivational paradigm, with representative suffixes from Poqomchi', a language of the K'iche'an branch (forms taken from Mó Isém 2006, 2007b and Dobbels 2003). Rows indicate the transitivity and voice of the construction, while columns indicate its general function. I explain these categories in more detail below in 2.3.3.1 and 2.3.3.2.

	Action	Argument	Instrument	Location	Perfect
Intransitive	*-iik* ~ *-ih*	*-eel*	*-b'al*	*-b'al*	*-naq*
Transitive agent-oriented	*-(V$_R$)m*, *-V$_R$j*, AP-*iik*	*-ool/-uul*, *-een*, *-oom*, AP-*eel*	*-b'al*	*-b'al*	*-(V$_R$)m*
Transitive patient-oriented	PAS-*iik*	*-ooj/-uuj*, *-maj* (=perfect participle), PAS-*eel*			*-ooj/-uuj*, *-maj*

Table 7: Derivational paradigm of Mayan languages, with examples from Poqomchi'.

2.3.3.1. Base attachment

The rows of Table 7 represent the type of base the derivational process applies to: transitive or intransitive verbs. Within transitive verbs, I make a distinction between derivations that are agent-oriented (their meaning is more closely associated with the agent) or patient-oriented (their meaning is more closely associated with the patient). This distinction plays out differently depending on the derivational category, as I will describe in the next section.

As mentioned above in section 2.1.3.2, Mayan languages further distinguish root and derived transitive verbs, where the former are roots with a CVC phonological structure, and the latter are (typically) derived from some other source (e.g. causative derivations of an intransitive verb or positional root) and often have a structure larger than CVC. Root and derived transitive verbs often have different morphological exponents for a given derivational category; for example, in Poqomchi', the default perfect participle suffix is *-ooj/-uuj* for root transitive verbs and *-$V_R$maj* for derived transitive verbs (Mó Isém 2006: 219-220). Less frequently, intransitive roots and derived intransitive bases (such as passive or antipassive stems) take different derivational morphemes. I have glossed over the root/derived distinction in Table 7 for simplicity of presentation, but the verb class distinction becomes relevant when discussing specific morphemes, and so I list root and derived transitive verbs separately in the data tables below.

2.3.3.2. Derivational categories

The columns of Table 7 represent the following derivational categories: action, argument, instrument, and location nominalizations, along with perfect participles.

"Action" comprises gerunds, or nouns referring to the action of the verb. Depending on the source, these are sometimes called "infinitives," "verbal nouns," or "action nominalizations." An action nominalization of a transitive verb may be active or passive (classified here under "agentive" or "patientive"): in Poqomchi', the root *cham-* 'to delay (someone)' may be derived as the active verbal noun *cham-aj* 'delaying (someone)' or as the passive verbal noun *cham-ar-ik* 'being delayed' (Dobbels 2003: 87). In most cases, the passive gerund is simply formed by passivizing the verb (in this case, using the *-ar* passive suffix) and then deriving it as an intransitive gerund (using *-ik*). The extent to which these deverbal forms behave like canonical nouns or retain some verbal behavior varies according to the language; I discuss this in relation to the **-ooj/-uuj* infinitive in chapter 6.

"Argument" comprises nouns that refer to a primary argument of the base verb (i.e. a subject, agent, or patient nominalization). An argument nominalization of an intransitive verb is a subject nominalization: *kim-* 'die' yields *kimeel* 'mortal', literally 'one who dies' (Dobbels 2003: 287). Transitive verbs may have agentive or patientive argumentnominalizations, referring to a habitual agent or patient of the verb: in Poqomchi', the agent nominalization of *k'am-* 'to carry, bring' is *k'amool* 'carrier, one who brings' (Dobbels 2003: 320).

Patient nominalizations in Mayan languages are nearly always indistinguishable from perfect participles; in K'iche', for example, *mok-oom* (from *mok-* 'to ask for the services of') may be translated either as the perfect participle 'asked for the services of' or as a patient noun meaning 'one whose services have been asked for', i.e. 'servant' (Larsen 1988: 236). Even in languages where perfect participles are not clearly used as nouns, they often carry the same function that a patient nominalization would: highlighting the state of an entity who has undergone the action of the verb. As will be seen in chapter 4, this fact is critical to understanding the history of the perfect. A few languages can productively create patient nominalizations that are distinct from the perfect participle. For example, the Mam suffix *-eenj* productively creates patient nouns: *txik-* 'cook' becomes *txikeenj* 'something cooked' (England 1983: 118). The regular perfect participle suffix in Mam is *-'n*: *jaqo-* 'open sth.' becomes *jaqo'n* 'opened' (England 1983: 125). Poqomchi' does not have a productive patient noun suffix distinct from the perfect participle, but there are a few examples of patient nouns formed as subject nominalizations of passive verbs: *taqareel* 'messenger' (literally 'sent one') is derived from the root *taq-* 'send' via the passive *-ar* and intransitive subject nominalization *-eel* (Dobbels 2003: 650).

The "Instrument" and "Location" columns include nominalizations of an instrument or location associated with the verb. In many Mayan languages, these are identical: Poqomchi' *tikb'al* (from *tik-* 'to sow') can mean either 'instrument for sowing' or 'place of sowing' (Mó Isém 2006: 219). Some languages use distinct morphology for the two categories: in Q'eqchi', the suffix *-leb'* typically creates instrument nouns (e.g.

awleb' 'tool for sowing' from *aw-* 'to sow'), while *-b'aal* creates location nouns (e.g. *warib'aal* 'bedroom', from *war-* 'to sleep') (Tzul and Cacao 1997: 74). Because these nouns refer to the instrument or location, a separate entity from the agent or patient, Table 7 does not distinguish between an agent- or patient-oriented version of either category. In English, one could coerce a voice distinction in locative expressions through a paraphrase, for example as "the place of eating" and "the place of being eaten," but the practical difference between these is almost nonexistent and the latter is very marginal in English. I have not come across any examples of a Mayan language expressing this distinction morphologically.

Finally, the "Perfect" column indicates markers of perfect aspect. In a semantic description, one would expect these to be included in the paradigm of aspect markers, rather than with derivational morphology. However, on the morphosyntactic level, perfect markers behave more like derivational morphemes in many Mayan languages (as discussed in section 2.2.2 above). Diachronically, the history of perfect marking interacts with the rest of the derivational paradigm shown here, notably with patient nominalizations, but also (surprisingly) with gerunds. As will be seen in chapter 6, the suffix **-ooj/-uuj* can be reconstructed as an infinitival suffix in proto-Central Mayan, but now marks perfect aspect in Poqomchi' and in Tseltalan languages. For these reasons, this dissertation treats perfect marking as part of the derivational paradigm of verbs, rather than part of the inflectional paradigm. Of course, the perfect does still play a role in the aspectual system, so future work on aspectual semantics may clarify this relationship. In Table 7, perfect marking on intransitive verbs is self-explanatory. For transitive verbs,

the “agentive” row includes perfect markers that appear in active voice, while the “patientive” row indicates perfect marking in passive voice (i.e. the passive perfect participle).

More specialized types of nominalizations exist that do not fit neatly into the above paradigm: for example, Mam has a productive nominalizing suffix *-b’een* ‘resultant locative.’ This has elements of a patient noun and a location noun in that it indicates “the place where an action has occurred,” as in *jusb’een* ‘burned place’ from the transitive verb *juus-* ‘burn’ (England 1983: 119). Future work may revise the derivational paradigm in Table 7 to distinguish more specific categories.

2.3.4. Variation in the Mayan perfect paradigm

Following the general model I introduced in the previous section, perfect participles in Mayan languages appear in three broad contexts: intransitive, active transitive, and passive transitive. This is crosscut by a distinction between verb roots and derived verb stems. In the data tables throughout this dissertation, I show the root/derived distinction only for perfect participles of transitive verbs; there is less variation between root and derived intransitive verbs, and I discuss any differences in the main text where relevant.

Table 8 shows the paradigm of perfect aspect markers in Mayan languages. A gray box indicates that the language (apparently) lacks a form, while ND indicates that the sources have no data about that construction. It is worth noting here that this table sidesteps the theoretical question of whether a given perfect morpheme behaves more like

canonical inflection or derivation (as discussed in section 2.2.2 above); the focus of this table is to identify forms that have a perfect meaning as preparation for understanding their cognacy and distribution across the family. Subsequent chapters will discuss the productivity or syntactic behavior of a given morpheme when relevant.

Branch	Language	IV	Active		Passive	
			RTV	DTV	RTV	DTV
K'iche'an	K'iche'	*-inaq*	*-oom/-uum*	*-V_1m*	*-oom/-uum*	*-V_1m*
	Achi	*-inaq*	*-oom/-uum*	*-m*	*-oom/-uum*	*-m*
	Kaqchikel	*-(i)näq*	*-om/-um ~ -on/-un*	*-m ~ -n*	*-om/-um ~ -on/-un*	*-m ~ -n*
	Tz'utujil	*-naq*	*-oon/-uun*	*-V_1n*	*-oon/-uun*	*-V_1n*
	Sakapultek	*-naq*	*-V_Rm(aj)*	*-m(aj)*	*-V_Rm(aj)*	*-m(aj)*
	Sipakapense	*-naq~-noq*	*-maj*	*-maj*	*-maj*	*-maj*
	Poqomam	*-inaq, -anaq, -lam*	*-om/-um*	*-m*	*-ooj/-uuj*	*-(a)maj*
	Poqomchi'	*-(V_R)naq, -inaq, -lam*	*-om ~ -V_Rm*	*-m*	*-ooj/-uuj, -(V_R)maj*	*-maj*
	Uspanteko	*-V_R´l, -íl, -él -(i)naq*	*-oom*[4]	*-V_1m*[4]	*-V_Rl, -oom*[4]	*-l*
	Q'eqchi'	*-enaq*	*-om*[4]	*-m*[4]	*-b'il*	*-mb'il*[4]
Mamean	Mam	*-na(q), -ni, -naj**, oo-taq, maa-taq*	*oo-taq, maa-taq*	*oo-taq, maa-taq*	*-'n(-maj), -na(j), -aj*	*-'n(-maj), -na(j), -aj*
	Tektiteko	*-naq, matx, (o)je=tq*	*matx, (o)je=tq*	*(o)je=tq*	*-' ~ -m; -o-'n, -maj, -naq**	*-' ~ -m; -o-'n, -maj*
	Awakateko	*-naq*	*-naq*	*-naq*	*-ij; -ijt*	*-Vnt*
	Chalchiteko	*-naq*	ND	ND	*-ij*	ND
	Ixil	*-y(aj), -na(')q ~ -naj*	*-l(a')*	*-l(a')*	*-l(a'), -el*	*-l(a'), -mal*

[4] The *-(V)m* forms in Uspanteko and Q'eqchi' are based on preliminary language survey data (Kaufman 1976b: 77); these forms are not mentioned in more recent descriptive grammars of either language.

Q'anjob'alan	Q'anjob'al	*-naq*			*-b'il*	*-b'il*
	Akateko	*-naj*	*-b'il*	*-b'il*	*-b'il*	*-b'il*
	Popti'	*-naj*			*-b'il*	*-b'il*
	Mocho'	*-naq*	ND	ND	*-ob'aal*	*-ob'aal*
	Chuj	*-nak*	*-nak*	*-nak*	*-b'il, -nak*	*-b'il*
	Tojol-ab'al	*-el*	*-unej ~ -uj*	*-unej ~ -uj*	*-ub'al*	*-ub'al*
Tseltalan	Tseltal	*-em~-en*	*-oj*	*-ej*	*-bil*	*-bil*
	Tsotsil	*-em*	*-oj*	*-oj*	*-bil*	*-bil*
Ch'olan	Chol	*-em~-eñ*			*-V_Rl*	*-bil*
	Chontal	*-en, san/jan*	*san/jan*	*san/jan*	*-el, -V(l) ~ -V'*[5]	*-bi(l), -äl*[6]
	Cholti'	*-em~-en*			*-b'il*	ND
	Ch'orti'	*-em~-en*			*-b'ir*	*-b'ir*
Yucatecan	Yucatec	*-a'an, -V_Rl, -en*	*-m-aj*	*-m-aj*	*-b'il, -a'an*	*-b'il, -a'an*
	Itzaj	*-a'an, -al*	*-m-aj*	*-m-aj*	*-b'il, -a'an*	*-b'il, -a'an*
	Mopan	*-a'an, -en, -V_Rl*			*-b'il, -a'an*	*-b'il, -a'an*
	Lacandon	*-a'(a)n*	*-m-an ~ -m-än*	*-m-an ~ -m-än*	*-b'il~-b'äl, -a'an*	*-b'il~-b'äl, -a'an*
Wastekan	Teenek	*-(V)nek, -(V)xineenek, -neenek, -aamath*	*-aam-al*	*-aam-al*	*-aam-ej*[7]	*-aam-ej*
	Chicomuseltec	*-(e)nek*[8]	ND	ND	ND	ND

Table 8: Perfect suffixes in all Mayan languages. "ND" indicates no data available for a form; a gray box indicates the absence of a form. A double asterisk marks an unproductive morpheme.

[5] While not expressly called "perfect participles," these are adjectives derived from verbs. *-V(l)~-V'* appears in both stative predicates and attributive adjectives, *-el* only as an attributive adjective.

[6] *-äl* is used as an attributive adjective and *-bi(l)* as a predicate.

[7] Kaufman (2015: 313) lists a Teenek patient noun form *-bil* 'thing V-en' in his cognate table. He gives no citation for this form, nor have I found it corroborated in published descriptions. The closest match is the form *-bi-laab* 'abstractive patientive noun' in forms such as *mat-bi-laab* 'loan' from *mat-iy-* 'lend it' (Edmonson 1988: 285-286, citing Larsen's 1955 dictionary). I have found no examples of *-bil* in isolation.

[8] Zimmerman (1955: 83)

The remaining chapters in this dissertation will unpack Table 8 and discuss the morphemes individually. Here, as a broad overview, I point out the major areas of variation between Mayan languages. Every Mayan language has a way to mark intransitive and passive transitive perfect participles, but not every Mayan language has an active transitive perfect construction: Q'anjob'al, Popti', Mopan, and most Ch'olan languages lack an active perfect construction altogether. Fundamentally, this makes sense if the perfect participle is considered a deverbal form (like a patient noun) that has a passive reading by default; the active perfect usage is secondary. In sections 4.4.3 and 6.4.2, I discuss how active perfect constructions can arise from patient nouns.

Another major point of variation, in those languages that have both an active and passive transitive perfect construction, is whether the two constructions use the same or different suffixes. Teenek and most K'iche'an languages use etymologically related suffixes for the active and passive perfect, while Yucatecan and Tseltalan languages use distinct suffixes. In cases where the active and passive forms overlap, this can once again be readily explained if the passive perfect participle is the basic form, upon which the active perfect form is built. This will turn out to be the biggest analytical claim of this dissertation: I reconstruct the proto-Mayan active and passive perfect suffixes both as **(-o)-'m*. **(-o)-'m* was underlyingly a patient nominalization, which both the active and passive perfect constructions were based on (section 4.4.3). I differ here from Kaufman (2015: 279, 319) who reconstructs two active perfect suffixes, a verbal **(-o)-'m* "perfect

status" and deverbal **(-o)-ej* "active perfect participle/gerund," both contrasting with the passive perfect participle **-b'il.*

2.4. DATA SOURCES

2.4.1. Types of sources

Because this study has such a broad focus, covering every Mayan language, I have relied here on published grammars and dictionaries of Mayan languages rather than primary language data. I assessed the available descriptions of Mayan languages and focused on several secondary sources that I found to be the most thorough and reliable. This section discusses the types of sources I consulted and my strategies for citing them in this dissertation. The Appendix lists the individual sources I used for each language.

The vast majority of data used in this dissertation will come from descriptive grammars of Mayan languages, including formally published books, theses, and unpublished monographs by those who have done fieldwork in the area. There has been a dramatic increase in quality linguistic descriptions published over the last 40 years. Since the early 1990s, especially in Guatemala, speakers of Mayan languages have published many resources about their own languages, under the auspices of organizations such as the Academia de Lenguas Mayas de Guatemala (ALMG), the Proyecto Lingüístico Francisco Marroquín (PLFM), and Oxlajuuj Keej Maya' Ajtz'iib' (OKMA). In addition,

numerous dissertations, monographs and scholarly articles on Mayan languages have been published by non-Mayan linguists and scholars.

I prioritized sources that offered the most detail possible about perfect aspect and participial constructions. Some grammars list only the general form of a given suffix with a few single-word examples and no other commentary. Others exhaustively document the allomorphs of that suffix, including irregular forms. Where possible, I preferred sources that gave full-sentence examples of each construction, making it possible to examine the usage in context instead of relying solely on the author's analysis.

2.4.1.1. Grammatical descriptions

Grammars of Mayan languages fall under three major headings: descriptive, normative, and pedagogical. Both Mayan and non-Mayan linguists have published descriptive grammars and articles, ranging from broad grammatical overviews to detailed analyses of a particular linguistic construction.

I have chosen to consult normative and pedagogical grammars in some cases, though I approach these with caution and prefer descriptively oriented resources whenever possible, all else being equal. I include normative and pedagogical grammars for two reasons. First, they are generally written by linguistically-informed native speakers of the language (as with Mateo Toledo's 1998 pedagogical grammar of Q'anjob'al), so that the examples and intuitions tend to be reliable. Second, for some of

the less well-described languages, normative and pedagogical grammars often represent one of the few sources of data, and sometimes fill in gaps left by the other sources.

2.4.1.2. Dictionaries

Besides grammars, another major source of data for the dissertation is dictionaries. Because nominalizations are derivational categories, they often appear as lexical entries in a dictionary, associated with their root verb. To the extent that the dictionary reflects actual usage, it can be a wealth of data about derivational morphology.

An advantage of dictionaries is that they often reveal unproductive or semiproductive affixes that are not robustly described in grammars. As an example, dictionaries of K'iche' list words with a semiproductive patient noun suffix *-V'n*: *eq**a'n*** 'a load' (from *eqaj* 'to carry (on back)'; *jun k'al**e'n*** 'a bundle of firewood' (from *k'al(o)* 'to gather (firewood)'); *por**o'n*** 'a bonfire, conflagration' (from *poroj* 'to burn something') (Christenson n.d., my emphasis). López Ixcoy and Sis Iboy (2007: 24) briefly mention an unproductive *-o'n* nominalizing suffix, but Christenson's dictionary examples show a wider range of stems that the suffix can occur with. The ALMG Q'eqchi' dictionary (CLQq 2004) shows many clear examples of *-om* patient nouns, even while grammatical descriptions disagree on whether to call this suffix an imperative (Stewart 1980, 2016; Tzoc 2003) or a patient noun (DeChicchis 2009) (see section 4.2.1.1 for discussion).

Because dictionaries are highly edited works that do not (generally) cite primary sources for each word, there is some risk that they contain spurious examples. Sometimes the entry indicates that the author is aware of a morphological pattern: for example, Dobbels (2003) systematically labels the root, infinitive, perfect participle, agentive, and other derived forms of a given Poqomchi' verb. This systematicity raises the question of whether Dobbels (a non-native speaker) found direct attestation of every form or generated some of the derived forms himself using his conscious knowledge of the language. However, if dictionary examples consistently show a morphological pattern, especially if the author does not call attention to the pattern (like the *-V'n* examples above from Christenson's dictionary), this strongly suggests that the pattern is valid.

2.4.1.3. Hieroglyphic texts

In a few places in this dissertation, I reference scholarly interpretations of Classic Mayan, the Ch'olan language represented in most hieroglyphic inscriptions. These inscriptions are monolingual texts without translations or glosses, so the structure of Classic Mayan grammar is the subject of ongoing analysis.

Historical linguistics (especially of the Ch'olan-Tseltalan branch) is often used as evidence for deciphering Classic Mayan grammar, but this can lead to circular reporting if the Classic Mayan analysis is then fed back into the reconstruction. Of course, not all instances where the historical reconstruction and decipherment inform each other are circular reasoning; if the glyphic and comparative data are both consistent with the same

model of Mayan language history, then this is valuable evidence for the plausibility of that model. Nevertheless, such a crossover should be made consciously and with caution, considering alternative models that explain the data equally well or better.

For example, Kaufman in a 1989 manuscript (an earlier draft of his 2015 working paper) reconstructed *-*o*-*ej* to proto-Mayan as an "active perfect participle/gerund." MacLeod (2004: 314-316) cites Kaufman's reconstruction as support for identifying a -*VVj* perfect suffix in Classic Mayan (whereas Robertson et al. 2004 analyzed the same suffix as a "nominalized antipassive," i.e. an action nominalization). Kaufman, in a later draft of the same working paper (Kaufman 2015: 319), cites MacLeod's identification of a -*VVj* perfect suffix as evidence for reconstructing the "perfect" function of *-*o*-*ej* to proto-Ch'olan-Tseltalan, without acknowledging the role of his 1989 reconstruction in her argument. I am not dismissing Kaufman's reconstruction or MacLeod's Classic Mayan identification as wholly circular, as they both offered independent reasons for their analyses, but this example illustrates the need to examine Classic Mayan affix identifications critically.

It is not my intent in this dissertation to weigh in directly on questions of Classic Mayan affix identification, though the analysis I present here may be relevant to scholars working on the hieroglyphs. I will reference scholarly work on Classic Mayan glyphs only to show how given analyses are or are not consistent with the historical analysis I have assembled from comparative data.

2.4.1.4. On corpora and fieldwork

I have relied on secondary sources rather than corpus data or original fieldwork for two reasons. First, for many Mayan languages, a transcribed and glossed corpus is not readily available. Those that do exist are usually not large enough to make robust generalizations about perfect marking, and their formats often vary widely, which impedes comparability.

Second, and more importantly, descriptive grammars are generally sufficient for the level of detail I am considering in this dissertation. For a given affix, I am primarily considering its phonological form, base attachment (what stems it occurs with), basic function, and the resulting form's syntactic category (noun, verb, adjective, etc.)—information that is usually addressed by a grammar. Future work can and should analyze each construction in more detail—syntactic behavior, semantics, discursive use—using original fieldwork and detailed examination of available corpora; however, achieving this level of detail for the whole Mayan language family would quickly exceed the time and space constraints of a single dissertation.

2.4.2. Citation strategies

Due to the large number of sources consulted, it would be redundant and space-intensive to cite them individually in cases where all sources agree. To streamline the data presentation while adequately documenting the variation that does exist, the following strategy will be used: if no reference is given for a cited form, this indicates either that

there is consensus among the sources consulted, or that the form comes from my most reliable source for that language (as identified in the Appendix) even if the other sources do not mention it. My observation has been that where descriptions of the same language differ, this more often reflects a difference in the depth of analysis or choice of terminology than actual variation within the language. When there is enough variation among sources to significantly affect the analysis, I will document this in the text of the chapter.

Examples of variation among sources that does not affect the analysis include:

- Orthographic differences, so long as they reflect the same phonology: writing the agentive proclitic *'aj=* as [ʔaχ] in IPA; writing prevocalic [ʔ] with a hyphen (*aj-ux*) or apostrophe (*aj'ux*). In this I include variation in vowel length, if one source represents vowel length and the other does not.
- Typographic differences: using a hyphen (*'aj-*), plus sign (*'aj+*), or equals sign (*'aj=*) to mark a morpheme boundary, so long as this does not reflect a descriptive difference in the morpheme's behavior. Sources frequently represent the agentive proclitic *'aj=* as a prefix, even when they show it attaching freely to a variety of bases (including phrasal elements), which is more characteristic of a clitic.
- Subtly different glosses, or translations of glosses, that clearly refer to the same category (English 'Agent noun', 'Agent nominalization', 'Agentive noun', and Spanish 'Sustantivo de agente', 'Agentivo').

When citing specific examples, in most cases I have updated (or added) glosses to be consistent throughout the dissertation, without comment. For example, "incompletive" and "imperfective" are often used interchangeably in Mayanist literature, and aspectual semantics is not the focus of this dissertation, so I gloss them throughout as INC regardless of what term or abbreviation the original source used. The only exceptions are if the original author is overtly commenting on the meaning of the morpheme, if I have a principled reason to disagree with their gloss in a way that affects the analysis, or if their original example was unglossed and I was unable to determine the correct gloss from the surrounding discussion; in these cases, I will address the discrepancy in the main text.

2.5. OUTLINE OF THE DISSERTATION

Having presented more context about Mayan languages and the paradigm of Mayan perfect marking, I here expand on the dissertation outline presented in section 1.1. The rest of this dissertation will proceed as follows. Chapter 3 discusses the diachrony of perfect markers that appear with intransitive verbs. In this chapter, I argue that **-i-naq* was the proto-Mayan intransitive perfect suffix. I give an account of how the proto-Central Mayan **-e'm* intransitive action nominalization suffix became a perfect participle in Ch'olan-Tseltalan languages and spread to Yucatecan languages by contact. Chapter 4 discusses perfect marking on transitive verbs in active and passive voice. The major claim of this chapter is that proto-Mayan used the suffix **(-o)-'m* to mark the active and

passive perfect participle, and that the other widespread participial suffix *-b'il* was an innovation that spread through language contact. The next two chapters discuss two specific transitive perfect suffixes that have a particularly complex history. Chapter 5 discusses the perfect participle suffix *-maj* that appears in highland Mayan languages. I argue that *-maj* was innovated in the Poqom subgroup and spread areally through a language contact zone that I term the "Sacapulas Corridor," following a known trade route. Chapter 6 discusses the proto-Central Mayan suffix **-ooj/-uuj*, which appears as a perfect marker in Tsotsil, Tseltal, Tojol-ab'al, Poqomam, and Poqomchi', but which I argue originally created action nominalizations of transitive roots. Chapter 7 assembles a complete picture of diachronic change in the perfect paradigm, suggests future research questions within Mayan, and offers takeaways for researchers looking at change in derivational morphology.

Chapter 3: Perfect marking of intransitive verbs

This chapter discusses perfect aspect morphology that appears with intransitive verbs in Mayan languages. In this chapter I will argue for the reconstruction of **-i-naq* to proto-Mayan as the perfect participle suffix of intransitive verbs, due to the ubiquity of its reflexes across the family. I will also offer an account of the innovation of other intransitive perfect forms. In particular, I show that the proto-Central Mayan action nominalization **-e-'m* became a perfect participle in Ch'olan-Tseltalan languages and spread to Yucatecan languages by contact. I also show that stative morphology associated with positional roots is a common source of perfect morphology used with verbs: the *-a'an* participial suffix of Yucatecan languages and the *-V_Rl* suffix found in many Lowland Mayan languages both originally created non-eventive "stative participles" from positional roots.

As seen below in Table 9, most Mayan languages use a suffix of the form *-(i)naq* (varying to *-naj*, *-nak*, or *-eenek*). Ch'olan-Tseltalan languages use the form *-em~-en* for intransitive verbs and Yucatecan languages have *-a'an*, both innovative. Less common suffixes for intransitive perfects include *-Vl*, present in Uspanteko, Tojol-ab'al, and Yucatecan languages, *-lam* which appears in Poqomam and Poqomchi', and *-y(aj)* which uniquely occurs in Ixil. I discuss the history of each of these forms and the relationships between them below. The preverbal particles seen in Mam (*oo-taq*, *maa-taq*), Tektiteko (*matx*, *oje=tq*), and Chontal (*san/jan*) will be discussed in sections 4.2.5.4 and 4.2.5.5.

Branch	Language	Suffix
K'iche'an	K'iche'	*-inaq*
	Achi	*-inaq*
	Kaqchikel	*-(i)näq*
	Tz'utujil	*-naq*
	Sakapultek	*-naq*
	Sipakapense	*-naq~-noq*
	Poqomam	*-inaq, -anaq, -lam*
	Poqomchi'	*-(V_R)naq, -inaq, -lam*
	Uspanteko	*-V_R´l, -íl, -él, -(i)naq*
	Q'eqchi'	*-enaq*
Mamean	Mam	*-na(q), -ni,, -naj**, oo-taq, maa-taq*
	Tektiteko	*-naq, matx, (o)je=tq*
	Awakateko	*-naq*
	Chalchiteko	*-naq*
	Ixil	*-y(aj), -na(')q ~ -naj*
Q'anjob'alan	Q'anjob'al	*-naq*
	Akateko	*-naj*
	Popti'	*-naj*
	Mocho'	*-naq*
	Chuj	*-nak*
	Tojol-ab'al	*-el*
Tseltalan	Tseltal	*-em~-en*
	Tsotsil	*-em*
Ch'olan	Chol	*-em~-eñ*
	Chontal	*-en, san/jan*
	Cholti'	*-em~-en*
	Ch'orti'	*-em~-en*
Yucatecan	Yucatec	*-a'an, -V_Rl*
	Itzaj	*-a'an, -al*
	Mopan	*-a'an, -en, -V_Rl*
	Lacandon	*-a'(a)n*
Wastekan	Teenek	*-(V)nek, -(V)xineenek, -neenek, -aamath*
	Chicomuseltec	*-(e)nek*

Table 9: Perfect suffixes occurring with intransitive verbs in Mayan languages.

3.1. EVALUATING AFFIX ORIGINS

As we will see in more detail in chapter 4, with transitive verbs, voice is relevant to understanding the distribution of perfect markers, and active and passive perfect forms are often synchronically connected. By contrast, intransitive verbs are single-argument predicates and do not undergo voice alternations, making it simpler to compare their forms across the family. Reflexes of *-*i*-*naq* are the most widespread intransitive perfect suffixes across the family, appearing in both Eastern Mayan and Teenek, so that I reconstruct *-*i*-*naq* with this function in proto-Mayan. However, tracing the perfect paradigm from proto-Mayan into the modern languages requires a detailed explanation of when and how it changed, and this is non-trivial in cases where the competing suffixes also span multiple subgroups. This section will evaluate the distribution of each set of cognate suffixes across the family in order to determine their most likely point of origin and how they developed in descendant languages. In section 3.1.1, I discuss the reconstruction of *-*i*-*naq* and changes that occurred to its phonological form and base attachment. In 3.1.2, I examine -*em*~-*en* participial suffixes in Ch'olan-Tseltalan and Yucatecan languages and trace their development from the proto-Central Mayan *-*e'm* intransitive action nominalization. 3.1.3 covers the -*a'an* participle of Yucatecan languages, which originally derives from a positional "stative participle" suffix. 3.1.4 summarizes my analysis of -*Vl* intransitive perfect suffixes that appear in several Mayan languages; a more detailed treatment of -*Vl* perfect suffixes with both transitive and intransitive bases appears in section 4.2.4 in the next chapter. 3.1.5 summarizes the

distribution of the semiproductive *-lam* intransitive perfect participle in Poqomam and Poqomchi', and 3.1.6 discusses the *-y(aj)* perfect of Ixil, a borrowing of the Classic Mayan *-iiy* past suffix.

3.1.1. *-i-naq*

3.1.1.1. *Reconstruction and function*

Outside of Ch'olan-Tseltalan and Yucatecan, reflexes of **-i-naq* are ubiquitous as the perfect participle suffix on intransitive stems, so that this suffix clearly reconstructs to proto-Mayan. Reflexes are found with intransitive verbs in all K'iche'an, Mamean, and Wastekan languages, and in most Q'anjob'alan languages. The Q'anjob'alan language Tojol-ab'al uses a reflex *-unej* with transitive verbs, and some Yucatecan languages use *-nak* with affective roots, though I suggest that the latter is not cognate (see below in 3.1.1.2). Mocho' grammatical descriptions do not mention the suffix, but it appears in dictionary examples such as *'ak'-(i)naq* 'having come (from afar)' (Kaufman 1967: 4).

Kaufman (2015) asserts that proto-Mayan distinguished "perfect status" **-i-naq* from the "perfect participle" **-e-'m.* Eastern Mayan, Q'anjob'alan, and Teenek later extended the perfect status marker **-i-naq* to become the perfect participle; Western Mayan languages lost "perfect status" as a category, so that Q'anjob'alan keeps **-i-naq* reflexes solely as participles, while Ch'olan-Tseltalan lost the suffix altogether (Kaufman 2015: 296). I have found no evidence to support this distinction historically; no modern language has a distinction between "perfect status" *-inaq* and "perfect participle" *-em,*

and Kaufman himself (2015: 296) states that every modern language with a reflex of *-*i*-*naq* can use it with a participial function. Because Ch'olan-Tseltalan languages are the only languages to use -*em* as an intransitive perfect marker, I instead consider perfect -*em* a Ch'olan-Tseltalan innovation and treat *-*i*-*naq* as the sole proto-Mayan intransitive perfect marker.

3.1.1.2. Base attachment

In most Mayan languages that retain a reflex of *-*i*-*naq*, it appears exclusively with intransitive verbs (Table 10), so that it can confidently be reconstructed to proto-Mayan in this context. This section notes other contexts where the suffix appears in descendant languages.

Branch	Language	Form	Occurs with
K'iche'an	K'iche'	*-inaq*	IV
	Achi	*-inaq*	IV
	Kaqchikel	*-(i)näq*	IV
	Tz'utujil	*-naq*	IV
	Sakapultek	*-naq*	IV
	Sipakapense	*-naq~-noq*	IV
	Poqomam	*-inaq, -anaq*	IV
	Poqomchi'	*-(V_R)naq, -inaq*	IV
	Uspanteko	*-(i)naq*	IV
	Q'eqchi'	*-enaq*	IV
Mamean	Mam	*-na(q), -ni, -naj***	IV, TV
	Teko	*-naq*	IV, Mediopassive TV
	Awakateko	*-naq*	IV, Active/Passive TV
	Chalchiteko	*-naq*	IV
	Ixil	*-na(')q ~ -naj*	IV
Q'anjob'alan	Q'anjob'al	*-naq*	IV
	Akateko	*-naj*	IV
	Popti'	*-naj*	IV
	Mocho'	*-naq*	IV
	Chuj	*-nak*	IV, Active/Passive TV
	Tojolab'al	*-uj ~ -unej*	Active TV
Wastekan	Teenek	*-(V)nek, -(V)xineenek, -neenek*	IV, Antipassive
	Chicomuseltec	*-(e)nek*	IV

Table 10: Form and base attachment of **-i-naq* reflexes in Mayan languages.

Chuj extended *-nak* from intransitive verbs (1) to active transitive verbs (2). There are examples of *-nak* being used as a passive perfect marker (3) (see also section 4.2.5.1).

CHUJ (Maxwell 1982: 128, Domingo Pascual 2007: 180)

(1) *b'ey-**nak**-hach*
walk-PERF-B2
'you have walked'

(2) *y-'il-**nak**-hach*
A3-see-PERF-B2
'he has seen you'

(3) a. *tz'ob'-**nak***
kiss-PERF
'kissed'

b. *tzol-**nak***
order-PERF
'ordered, set in order'

Law, in the context of his argument that Tojol-ab'al is a Chuj-Tseltal mixed language, treats Chuj *-nak* as the source of Tojol-ab'al's active transitive perfect *-uj~-unej* (Law 2017a: 55-56). This is plausible insofar as Chuj *-nak* is also used with active transitive verbs, unlike in most Mayan languages. *-nak* is not the only possible source of *-unej*; in section 6.2.2.3, I argue that Tojol-ab'al *-uj~-unej* was actually influenced both by Chuj *-nak* and by the Tseltal *-oj/-ej* perfect. With intransitive verbs, Tojol-ab'al instead uses *-el,* unlike either of its source languages (see sections 3.1.4 and 4.2.4.5 below). I suggest what happened is that Chuj first extended *-nak* from intransitive to active transitive verbs. Tojol-ab'al inherited this pattern from Chuj but later recruited *-el* as the perfect participle of intransitive verbs, leaving only the active transitive context for *-nak* (whose phonological form changed to *-unej*, possibly under the influence of *-oj/-ej* as discussed in section 6.2.2.3).

Awakateko uses *-naq* in a similar distribution to Chuj: it occurs with intransitive verbs (4) and, per McArthur and McArthur (1966: 227), active transitive verbs (5).

AWAKATEKO (CLA 2013: 206; McArthur and McArthur 1966: 227)

(4) a. *kyim-naq*
die-PERF
'dead'

b. *ul-naq*
come-PERF
'has come'

(5) *w-il-naq*
A1S-see-PERF
'I saw'

The Awakateko normative grammar states that *-naq* forms resultative participles of transitive verbs (6) (CLA 2013: 223). (6d) is an interesting case: CLA (2013) give the root as *txol* (translated as the noun 'row, line' by CLA n.d., 48), but they do not gloss the intervening morphemes. I have tentatively glossed *-i'nt* here as the *-V-nt* perfect suffix of derived transitive verbs (section 4.2.5.2), which would mean that this word has two perfect suffixes stacked on one another. CLA (2013) does not specify how salient the underlying agent is in these participles, so it is unclear whether these are best considered passive (which entails an agent, even if it is not in focus) or mediopassive (where the agent may be impersonal).

AWAKATEKO (CLA 2013: 223)

(6) a. *ky'ixp-naq*
injure-PERF
'injured'

b. *poq'-naq*
burst.open-PERF
'disemboweled'

c. *qatz-naq*
break-PERF
'broken'

d. *txol-i-'nt-naq*
row-DTV-PERF-PERF
'ploughed through'

Tektiteko uses *-naq* productively to create participles of intransitive roots (7) and unproductively with some transitive roots and positionals (8). Pérez Vail notes that the use of *-naq* with a transitive verb in Tektiteko entails a prior action, but not one that was directed by an agent (2007: 158-159), thus making these mediopassive perfect participles. This distribution parallels Ch'olan-Tseltalan's use of intransitive perfect *-em* in mediopassive contexts (see section 3.1.2.3 below).

TEKTITEKO (Pérez Vail 2007: 140, 159)

(7)	a.	*kam-**naq***	'dead'	< IV *kam-* 'die'
	b.	*ky'ib'-**naq***	'grown'	< IV *ky'ib'-* 'grow'
(8)	a.	*toq-**naq***	'broken'	< RTV *toq-* 'break'
	b.	*maq-**naq***	'covered'	< RTV *maq-* 'cover'
	c.	*wit'-**naq***	'seated'	< POS *wit'-* 'sit down'

The use of *-naq* or *-nak* with active transitive verbs in Chuj, Tojol-ab'al, and Awakateko is innovative. The suffix **-o-'m* reconstructs to proto-Mayan as the active transitive perfect suffix (see section 4.3). Likewise, Chuj, Awakateko, and Tektiteko's use of *-naq* to create (medio)passive participles of transitive verbs should probably be considered innovative based on its limited distribution.[9] If these uses of *-naq* with transitive verbs are innovative, Chuj and Tojol-ab'al (Q'anjob'alan) could have innovated separately from Awakateko and Tektiteko (Mamean), or the similarities could be due to Q'anjob'alan-Mamean contact, several other examples of which were noted by Barrett (2002).

Some Yucatecan languages have a suffix *-(V)nak* that creates participles from reduplicated affective roots. Hofling refers to these as adjectival forms but notes that they "have a more active, verbal sense" and are normally used as predicates. (9) shows this construction in Itzaj.

ITZAJ (Hofling with Tesucún 2000: 243)

(9) a. *A' che'-ej jach b'u-b'uj-**nak**.*
DET wood-TOP very REDUP-split-PTCP
'The wood splits a lot.'

b. *Aj-Jwan-ej san-sam-al ki-kil-**nak**.*
MASC-Juan-TOP REDUP-while-NOM REDUP-tremble-PTCP
'Juan trembles every day.'

[9] It is also plausible, however, that proto-Mayan used **-i-naq* to mark mediopassive perfect participles and that Chuj, Awakateko, and Tektiteko preserve this as a relic feature. The Ch'olan-Tseltalan use of intransitive participle *-em~-en* as a mediopassive participle (3.1.2.3) illustrates that this extension is fairly common, which could point to proto-Mayan having a similar pattern in the usage of **-i-naq*. Mediopassive perfect participles in proto-Mayan deserve further study. Whether or not **-i-naq* reconstructs with mediopassive perfect participles, the active transitive use of *-naq* is clearly innovative, for the reasons stated in the main text.

This *-(V)nak* affective participle suffix is common in Itzaj and Mopan and is also attested in Yucatec (Hofling 2017: 704), and so it reconstructs to proto-Yucatecan. On the surface, this is a plausible reflex of *-*i*-*naq*, as Yucatec underwent the **q*>*k* sound change common in Lowland Mayan languages. However, it is worth noting that Chol and Chontal have a similar construction, where a reduplicated affective root takes a *-na* suffix to create "iterative-frequentative intransitive verbs" (Kaufman and Justeson 2009: 222). Kaufman and Justeson treat *-na* as a borrowing from a nearly identical Mixe-Zoquean (non-Mayan) construction, where a reduplicated affective root takes the suffix /-naːyʔ/ (Ibid.). Justeson et al. identify the Yucatecan form as the same construction (1985: 9), and by extension, the Yucatecan form can be attributed to the same Mixe-Zoquean source (borrowed either directly or by way of Ch'olan). Note that the examples of *-(V)nak* in (9) express a frequentative meaning as in Chol and Chontal and do not have an obvious connection to perfect aspect as would be expected from a reflex of *-*i*-*naq*. The final *-k* in Yucatecan *-(V)nak* could be a reflex of the proto-Mayan intransitive category suffix *-*ik* or of the intransitive dependent/irrealis suffix *-*oq* after **q*>*k*.

3.1.1.3. Phonological reconstruction

Kaufman (2015: 279) reconstructs the form of the intransitive "perfect status" suffix as *-*i*-*naq*. This general form is uncontroversial, but the details deserve unpacking.

The final consonant is *q* in all Eastern Mayan languages and in Q'anjob'al. Yucatecan, Wastekan, and Chuj have final *k*, while others have *j* (/x/ in Akateko and

Tojol-ab'al; /χ/ in Popti' and some unproductive reflexes in Mam; /h/ in Nebaj Ixil). All uvular consonants became velar in Lowland Mayan languages, accounting for the *k* reflexes. Similarly, the *j* reflexes can simply be attributed to lenition of the final stop consonant into a fricative, which may have been irregular (see Law 2017a: 56 on Chuj *-nak* becoming *-unej* in Tojol-ab'al). This lenition would have progressed **q>k>j* [x] in all languages with the uvular/velar merger and **q>j* [χ] in all languages without it.

The middle vowel is *a* in most languages (*-(i)n**a**q, -n**a**k, -n**a**j*). Teenek and Tojol-ab'al have *e* (*-een**e**k, -un**e**j*) which can be considered an innovation. I am uncertain whether this sound change is phonologically conditioned or simply irregular.

Chajul Ixil's "stative resultative" *-na'q* uniquely has a glottal stop after the vowel. This glottal stop only appears in phrase-final position; phrase-medially, the suffix is *-naq*. The Nebaj variety has the form *-naj* everywhere (Ayres 1991: 45, 154). There are two possibilities for analyzing Chajul Ixil *-na'q*: either the glottal stop is a proto-Mayan retention that survives only in Chajul Ixil, or it is a Chajul Ixil innovation. As a parallel, the reflexes of the **(-o)-'m* transitive perfect participle suffix have a glottal stop in Mam, Teko, and (as the transitive infinitive *-o'n* or *-o'm*) Awakateko and Ixil, while it has a long vowel in K'iche'an (*-oom/-uum*) and Teenek (*-aam*). In Kaufman (2015) and the present analysis, the form **(-o)'m* reconstructs to proto-Mayan, and the glottal stop is deleted with compensatory vowel lengthening in non-Mamean subgroups (see section 4.2.1.2). Unlike the transitive perfect suffix, however, the intransitive counterpart has a glottal stop only in Chajul Ixil (not in other Mamean languages), and the vowel is short in all other Mayan languages, including those that distinguish vowel length such as K'iche'

and Teenek. For this reason, I suggest that the glottal stop in Chajul Ixil *-na'q* was innovated, possibly by analogy with the transitive perfect *-o'm.*

The final detail to discuss is the initial vowel. The suffix begins with a vowel in many languages, often optionally. Where it occurs, the initial vowel is usually *i,* but can be *a* (Poqomam *-**a**naq*), *e* (Teenek *-**e**nek*, Q'eqchi' *-**e**naq*), or vowel-harmonic (Poqomchi' *-$\boldsymbol{V_R}$naq*). Kaufman segments this vowel as a separate proto-Mayan affix, the **-i* thematic vowel (2015: 278). I concur with this analysis, but future work may further clarify the distribution of thematic vowels, and why this vowel does or does not appear in the various reflexes of **-i-naq*.

3.1.2. *-em~-en*

3.1.2.1. Cognacy and reconstructed function

The suffix *-em~-en* marks the perfect participle of intransitive verbs in Ch'olan-Tseltalan languages. The phonologically similar suffixes *-eem* or *-e'n* are found as intransitive gerunds in Eastern Mayan languages, as shown below in (10) from K'iche' (K'iche'an) and (11) from Awakateko (Mamean). I agree with Kaufman (2015: 312) in considering the Ch'olan-Tseltalan and Eastern Mayan suffixes cognate, as they are phonologically similar and both create deverbal forms from intransitive verbs. The Eastern Mayan gerund and Ch'olan-Tseltalan participle reconstruct at least to proto-Central Mayan as the form **-e-'m*. The preconsonantal glottal stop is preserved only in Mamean languages, while it became a long vowel through compensatory lengthening in K'iche'an languages

(compensatory lengthening also affected the phonologically similar *-*o*-*'m* transitive perfect, as discussed in section 4.2.1.2).

K'ICHE' (Larsen 1988: 192)

(10)	a.	*b'iin-**eem***	'walking, a walk, a trip'	< *b'iin*- 'walk'
	b.	*atin-**eem***	'bathing, bath'	< *atin*- 'bathe'

AWAKATEKO (CLA 2013: 181)

(11)	a.	*i'tz-**e'n***	'to be born'
	b.	*kyim-**e'n***	'to die'

CLM (2001) gives three examples of an intransitive *-en* participle in Mopan, a Yucatecan language (12). Bricker (2019) notes the same *-en* form in colonial Yucatec (13), though it is unproductive in modern Yucatec. The regular intransitive participle suffix in Yucatecan languages is *-a'an* (section 3.1.3 below). There are at least three ways to explain this. One option, which I do not pursue here, is that Mopan *-en* is unrelated to Ch'olan-Tseltalan *-em~-en*. Another is that the participial function of *-em~-en* is a retention from proto-Mayan, preserved in both Mopan and Ch'olan-Tseltalan. A third possibility is that Mopan gained this suffix from contact with Ch'olan languages. Prior to the Spanish conquest, Mopan was spoken in an area geographically adjacent to Ch'olti' and Ch'orti' (Law 2014: 23). Yucatecan and Ch'olan-Tseltalan languages were in intense contact from the Classic Period onward: they shared many loanwords, sound changes, and grammatical developments, forming the Lowland Mayan linguistic area (Justeson et al. 1985, Law 2014; see section 4.4 for more discussion of Lowland areal diffusion). In

this context, for Mopan and other Yucatecan languages to borrow a participial suffix from Ch'olan languages is perfectly plausible.

MOPAN (CLM 2001: 148)

(12) a. *Kim-**en**-Ø* *a* *winik-i*
die-PERF-B3S ART man-SUF
'The man is dead.'

b. *Ti-man-s-aj-Ø* *a* *chuw-**en*** *kol-o*
A1P-pass-CAUS-COM-B3S ART burn-PERF field-SUF
'We passed by the burned field.'

c. *Säkim-**en**-Ø* *a* *nooch'up-u*
faint-PERF-B3S ART woman-SUF
'The woman has fainted.'

YUCATEC (COLONIAL) (Bricker 2019: 261)

(13) a. *kim-en*
die-PTCP
'dead'

b. *tzil-en*
unravel-PTCP
'unravelled, torn, shredded'

Given the strong evidence for reconstructing **-i-naq* as the intransitive perfect participle in proto-Mayan, based on its reflexes in Wastekan, Q'anjob'alan, and Eastern Mayan, I here assume that the participial function of *-em~-en* in Ch'olan-Tseltalan is innovative. The presence of innovative participial *-en* in Mopan is best explained by contact with Ch'olan-Tseltalan, as Ch'olan-Tseltalan is more closely related to Q'anjob'alan and Eastern Mayan languages (which all preserve **-i-naq*) than to Yucatecan (that is, Yucatecan separated from the other groups before Ch'olan-Tseltalan, Q'anjob'alan, and

Eastern Mayan diverged from each other; Ch'olan-Tseltalan and Yucatecan do not form a subgroup). If *-*em*~-*en* as a participle were considered a retention from proto-Mayan, then Wastekan, Q'anjob'alan, and Eastern Mayan would all have to have innovated *-*i*-*naq* separately.

As mentioned above in section 3.1.1.1, my analysis here differs from Kaufman's (2015: 312) reconstruction of *-*e*-*'m* to proto-Mayan as an "[intransitive] perfect participle/gerund," contrasting with the inflectional *-*i*-*naq* "perfect status" suffix (2015: 279). and *-*e*-*'m*, which marks the derivational "perfect participle/gerund." He speculates that Ch'olan-Tseltalan languages extended *-*e*-*'m* to perfect status, while other groups extended *-*i*-*naq* as the (deverbal) perfect participle (Kaufman 2015: 319). I reject this analysis for a few reasons. First, Ch'olan-Tseltalan languages (and Mopan which has been in contact with Ch'olan-Tseltalan) are the only Mayan languages where *-em*~*-en* marks perfect aspect. This means that, as I argued above, we cannot confidently reconstruct a perfect meaning to proto-Mayan. Kaufman mainly does so to fill a slot in the paradigm, having previously reconstructed the "transitive perfect participle/gerund" *-*o*-*ej* (Kaufman 2015: 319). (I discuss the latter suffix in chapter 6 and argue that it too was an action nominalization in proto-Central Mayan, without a perfect meaning.) Second, and most importantly, no modern Mayan language distinguishes an inflectional perfect *-*i*-*naq* from a deverbal perfect participle *-*e*-*'m*, the situation that Kaufman reconstructs for proto-Mayan.[10] His analysis requires him to state that *-*i*-*naq* took over

[10] Ixil innovated a similar distinction: the derivational "stative resultative" participle *-na'q* (<*-*i*-*naq*) contrasts with the inflectional perfect *-y(aj)* on intransitive verbs (Adell 2019: 268, 447). However, in this case, the reflex of *-*i*-*naq* is the deverbal one (not inflectional as in Kaufman's proto-Mayan

the function of *-*e'm*-, or vice versa, in every descendant language. It is much simpler to state that *-*i*-*naq* was the sole perfect marker of intransitive verbs in proto-Mayan and that the perfect meaning of -*em*~-*en* in Ch'olan-Tseltalan languages is innovative.

Wald (2007) discusses an -*om* suffix that appears with transitive and intransitive verbs in colonial Tsotsil documents, which appears similar in distribution to *-*e'm*. These act either as nominalizations or as adjectival participles (Wald 2007: 444).

COLONIAL TSOTSIL (Laughlin 1988, cited in Wald 2007: 444)

(14) a. *tz'et-**om***
cut.down-NOM
'felling of upright objects'

b. *tz'et-**om***[11]
be.cut.down-NOM
'that (upright) object which is cut in that way'

c. *'ech'-**om***
pass-PTCP
'old, stale'

d. *ch'i-**om*** *kelem*
grow-PTCP young.man
'young boy or rooster'

Wald claims that Colonial Tsotsil -*om* and -*em* are simply two forms of the same gerund suffix, and that the vowel was in process of changing to /e/ in the colonial period (2007: 447). Elsewhere he clarifies that Colonial Tsotsil actually had two -*om*/-*em* suffixes: one creating deverbal adjectives and gerunds, and another the "resultative suffix"

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reconstruction), and -*y(aj)* is clearly innovative (section 3.1.6), so this is not a retention of a proto-Mayan contrast.

[11] Wald states that the root *tz'et*- has become a passive stem here through zero-derivation (2007: 448).

(corresponding to the "perfect participle" in other descriptions) that he considers inflectional. The form of both suffixes changed from *-om* to *-em* over time; *-om* was preserved in some deverbal forms in modern Tsotsil, while the resultative became *-em* across the board due to its productivity as an inflectional morpheme (2007: 452-453). I note here that if modern Tsotsil *-em* comes from an earlier *-om,* it requires additional work to harmonize this with other modern Ch'olan-Tseltalan languages, which consistently have *-em* or *-en* with an /e/ vowel as in modern Tsotsil. If Wald's analysis is correct, then the suffix vowel must have changed from *o>e* not only in colonial Tsotsil, but in all Ch'olan-Tseltalan languages, long after these had all become separate languages.

The Colonial Ch'olti' manuscript has similar examples of an unproductive nominalization *-om* (15a-c) in addition to the expected *-em* participial forms (15d-f). Law (2014: 120) connects the colonial Tsotsil and Ch'olti' *-om* forms to the *-em* perfect participle. In turn, he suggests that the *-oom* future suffix in Classic Mayan is an extension of the *-Vm* perfect (Law 2014: 122).

COLONIAL CH'OLTI' (Morán 1695, cited in Law 2014: 121, my glosses[12])

(15) a. <colom>
*kol-**om***
hunt-NOM
'that which is seized in war'

[12] To identify roots, I have consulted Hull's (2016) dictionary of modern Ch'orti', closely related to Ch'olti'.

b. <v-colom tzi>
*u-kol-**om*** *tz'i'*
A3S-hunt-NOM dog
'what the dog hunts'

c. <ahcolom>
*aj-kol-**om***
AGT-hunt-NOM
'hunter'

d. <calem>
*kal-**em***
get.drunk-PERF
'drunk'

e. <polem>
*pol-**em***
destroy-PERF
'destroyed thing, desert'

f. <paquem buc>
*pak-**em*** *b'ujk*
bend-PERF clothing
'old clothing'

A complicating factor here is that two other deverbal *-Vm* suffixes are widespread across Mayan languages, both of which have an /o/ vowel: the *-o(o)m* agent nominalization (Kaufman 2015: 315) and the **-o-'m* transitive perfect (discussed in section 4.2.1). The variation in vowel quality could be due not to a sound change affecting the *-em~-en* participle, but to interaction with one of the other two *-Vm* suffixes. The Ch'olti' forms in particular may be more closely related to the proto-Mayan **-o-'m* perfect participle of transitive verbs. Note that <colom> in (15a-b) is based on a transitive root and acts much more like a patient noun ('that which is hunted'), whereas participial *-em~-en* in Ch'olan-Tseltalan creates deverbal adjectives from intransitive verbs. In section 4.4.3.2, I discuss

the colonial Tsotsil and Ch'olti' examples again in context of my argument that the proto-Mayan *-*o*-*'m* perfect is underlyingly a patient noun.

One possible way to reconcile Wald's analysis with the historical picture I present in this dissertation is to say that Colonial Tsotsil (or a Ch'olan-Tseltalan variety ancestral to it) extended a reflex of the transitive perfect participle *-*o*-*'m* to intransitive verbs. *-*e'm,* inherited from the proto-Central Mayan intransitive action nominalization, was also used with intransitive verbs, leading to the competition between -*om* and -*em* seen in Colonial Tsotsil. I present this as only one possibility; the relationship between the deverbal -*om* and -*em* suffixes seen in Ch'olan-Tseltalan languages is very complex and deserves further study using a close reading of their appearances in primary texts.

Finally, Bricker (2019) also mentions -*om* and -*em* participles derived from transitive and intransitive verbs in Colonial Yucatec (16). Colonial Yucatec had a separate -*en* participle, noted above in (13).

YUCATEC (COLONIAL) (Bricker 2019: 261)

(16) a. *kim-om*
die-PTCP
'mortal'

b. *ok-om*
enter-PTCP
'entering'

c. *k'ol-em*
transgress-PTCP
'mischievous, incorrigible, disobedient'

d. *xot-em*
determine-PTCP
'fixed, determined, resolute'

-om in Colonial Yucatec is a reflex of the proto-Mayan agent nominalization **-oom*. In (16a), *kimom* is translated as 'mortal', i.e. 'one who dies'; compare the adjectival form *kimen* 'dead' in (13a) above. *okom* 'entering' and *k'olem* 'disobedient' in (16b-c) similarly refer more to a propensity of the agent, rather than the result state of an event. The translation of *xotem* in (16d) is ambiguous; 'fixed' suggests a result state while 'determined, resolute' again focuses more on the agent's mentality. On this basis, I tentatively suggest that Colonial Yucatec *-em* is also related to the agentive **-oom*, but I leave its cognacy unresolved here. The Yucatecan examples deserve further study.

3.1.2.2. Phonological reconstruction

I reconstruct the proto-Ch'olan-Tseltalan intransitive perfect suffix as **-eem*, dissimilating to **-een* when the stem ends in a bilabial consonant. The suffix vowel is short *e* in all reflexes, but a comparison with other Mayan languages, informed by known sound changes within Ch'olan-Tseltalan, suggest that it was long in the proto-language. I discuss the evidence for the final consonant allomorphy and vowel length here.

The final consonant varies between *m* and *n* in Ch'olan-Tseltalan languages. In Tseltal, the *-en* allomorph appears after any bilabial consonant (Polian 2013: 167).

TSELTAL (Polian 2013: 165-168)

(17) a. *cham-**en***
die-PERF
'dead'

b. *lub-**en***
get.tired-PERF
'tired'

c. *xiw-**en***
be.scared-PERF
'scared'

d. *Ch'i-**em**=ix* *te* *ixim=e.*
grow-PERF=already DET corn=DET
'The corn is already grown.'

e. *Banti ba-**em**?*
where go-PERF
'Where did you go?'

Chol follows the same distribution as Tseltal: the *-eñ* allomorph (**n>ñ* in Chol[13]) occurs after any bilabial consonant (Martínez Cruz 2007: 84).

CHOL (Martínez Cruz 2007: 84)

(18) a. *k=tyojp'-**eñ*** *uk'um*
A1=break-PERF jug
'my broken jug'

b. *a=chäm-**eñ*** *ts'i'*
A2=die-PERF dog
'your dead dog'

c. *k=pul-**em*** *ajkum*
A1=burn-PERF sweet.potato
'my burned sweet potato'

[13] Chol has a palatal series *ty, ty', ñ* (Vázquez Álvarez 2011: 35), corresponding to alveolar *t, t', n* in other Ch'olan languages.

d. *k=sa<j>ty-**em*** *muty*
A1=lose<PAS>-PERF chicken
'my lost chicken'

Ch'orti' uses *-en* only after roots ending in *m* (19a-b); *-em* appears elsewhere (19c-e). Unlike Tseltal, *-em* can occur after non-nasal bilabial consonants as in (19c).[14] Colonial Ch'olti' seems to follow the same conditioning environment as Ch'orti', as shown in (20), though there are no examples where the stem ends in a bilabial consonant other than *m*.

CH'ORTI' (Wichmann 1999: 79-80)

(19) a. *cham-**en***
die-PERF
'dead'

b. *tz'am-**en***
get.wet-PERF
'wet, damp'

c. *kux-p-**em***
give.birth-MP-PERF
'born, germinated'

d. *pas-k'-**em***
open-MP-PERF
'open, clear'

e. *sat-r-**em***
lose-ITER-PERF
'lost'

[14] Note, however, that in (19c), *-p* is a suffix and not part of the root; it is possible (though unlikely) that a root ending in *p* would trigger dissimilation. Dissimilatory rules in Mayan languages sometimes care more about root phonology than about the immediate phonetic context; see for example the positional predicate suffix *-l ~ -n* in Sakapulteko, where the *-n* allomorph appears when the root contains an /l/, regardless of whether /l/ begins or ends the root (Mó Isém 2007a: 221).

CH'OLTI' (Sattler 2004: 397)

(20) a. *cham-**en***
die-PERF
'dead'

b. *kal-**em***
drink-PERF
'drunk'

c. *pak'-**em***
?-PERF
'old, decomposed'

Contrasting with the above, Chontal uses only *-en* and Tsotsil uses only *-em*, with no variation. All three of the Mopan examples that I have been able to identify (12) have *-en*, but in every case the root ends in a bilabial consonant, so it is unclear whether this is due to dissimilation.

CHONTAL (Knowles 1984: 257)

(21) a. *chäm-**en*** 'lukewarm' < IV *chäm-* 'die'
b. *pok-**en*** 'washed' < RTV *pok-* 'scrub'
c. *chol-**en*** 'pruned' < DTV *chol-* 'prune'
d. *kab-**en*** 'dirty' < N *kap'* 'dirt, ground'

TSOTSIL (Haviland 1981: 101-102)

(22) *Lub-**em**-on* *ta* *j-mek.*
get.tired-PERF-B1 PREP A1-time
'I am very tired.'

(23) *Cham-**em*** *xa* *li* *j-tot* *e.*
die-PERF already DET A1-father PH.FIN
'My father has already died.'

In summary, dissimilation of *-em* to *-en* is found in Tseltal, Chol, Colonial Ch'olti', and Ch'orti'. Tsotsil uses only *-em,* while Chontal uses only *-en.* Eastern Ch'olan languages (Ch'olti' and Ch'orti') use the *-en* allomorph only after /m/, while Tseltal *-en* and Chol *-eñ* appear after any bilabial consonant. The Mopan examples, whatever their origin, are not numerous enough to show a clear pattern. I reconstruct the Tseltal and Chol pattern to proto-Ch'olan-Tseltalan (*-*eem* dissimilates to *-*een* after any bilabial consonant) because it is found in both the Tseltalan and Cholan subgroups; the Tsotsil, Chontal, and Eastern Ch'olan patterns are each limited to a single branch and so they should be considered innovative. Each of the innovative patterns can be derived through analogical leveling: Tsotsil and Chontal leveled all instances of the suffix to *-em* or *-en* respectively, while Eastern Ch'olan leveled the suffix to the basic form *-em* except in one dissimilatory context (after /m/).[15]

Proto-Ch'olan-Tseltalan had a vowel length distinction which was lost in all modern descendant languages.[16] Thus, even though the participle in all modern Ch'olan-Tseltalan languages has a short vowel (*-em* or *-en*), it is nontrivial to figure out whether

[15] Another possibility that I do not pursue here, but which could be maintained, is that proto-Ch'olan-Tseltalan had the Eastern Ch'olan pattern where dissimilation only occurs after /m/. One advantage of this view is that it implies a more gradual progression: proto-Central Mayan *-*e'm* did not undergo dissimilation, proto-Ch'olan-Tseltalan *-*eem* dissimilated to *-*een* in one context (after /m/), and Tseltal and Chol later expanded the dissimilatory contexts to include all bilabial consonants. I have argued against this view here because the Tseltal and Chol pattern occurs in two subgroups, while the Eastern Ch'olan pattern only occurs in one, but Tseltal and Chol could have undergone contact or parallel development.

[16] More precisely: The loss of vowel length is an areal feature that diffused through Lowland Mayan languages in the Classic Period (Law 2014: 37-38). Kaufman and Norman (1984: 85-86) state that the length merger happened in proto-Ch'olan (and, presumably, independently in Tseltalan). However, Classic Mayan hieroglyphs (representing an Eastern Ch'olan precursor of Ch'olti' and Ch'orti', per Houston et al. 2000) still consistently mark a vowel length distinction until around AD 700 (Law and Stuart 2017: 133), indicating that the merger did not take place until after Eastern Ch'olan (Ch'olti' and Ch'orti') and Western Ch'olan (Chol and Chontal) had separated.

the vowel in the proto-suffix was long or short. Classic Mayan preserved vowel length, but I am not aware of any examples of *-em~-en* in hieroglyphic texts.[17] I here argue that the proto-Ch'olan suffix likely had a long vowel (**-eem~-een*) based on comparison with the Eastern Mayan reflexes.

If the suffix had a long **ee,* there may be no definitive way to tell from the modern reflexes. Kaufman and Norman indicate that proto-Ch'olan-Tseltalan **ee* normally merged with **e* in Ch'olan, but that in some roots, **ee* raised to **i* (1984: 87). Besides roots, this vowel raising occurred in 2nd person plural Set A prefixes (pM **ee-* > pC **i-*, **eer-* > **iw-*). The vowel quality remained the same in the intransitive imperative suffix (pCT **-een* > pC **-en*) and the intransitive "incompletive" suffix (pCT **-eel* > pC **-el*) (Kaufman and Norman 1984: 91-93). If **ee* raised to **i* unconditionally, then we could predict that a proto-Ch'olan-Tseltalan **-eem~-een* perfect suffix with a long vowel should have become *-im~-in,* contradicting the actual modern form *-em~-en*; but because **ee>i* raising does not apply unconditionally, and in fact did not affect phonologically similar suffixes like the **-eel* incompletive and **-een* imperative, we cannot rule out pCT **-eem~-een* on this basis.

Forward reconstruction from proto-Central Mayan favors a long vowel. The cognate action nominalization suffix in proto-Central Mayan can be reconstructed as **-e-'m,* as discussed above in section 3.1.2.1, due to the Mamean reflexes having a preconsonantal glottal stop (see also the discussion of **-o-'m* in section 4.2.1.2). Houston

[17] Though Law (2014: 122-123) suggests that the *-oom* future suffix found in Classic Mayan and Colonial Yucatec is derived from the Ch'olan-Tseltalan perfect, partially on the basis of its restriction to intransitive verbs. If cognate with the perfect, the *-oom* future would provide evidence of a long vowel, but the difference in function and vowel quality raise enough questions that I do not include it here.

et al. (1998: 289-290) provide evidence that preconsonantal glottal stops in proto-Mayan became long vowels in proto-Ch'olan via compensatory lengthening. Proto-Mayan **oo* raised to **uu* in many environments in Ch'olan languages. This includes words that had a preconsonantal glottal stop, such as proto-Mayan **so'tz'* 'bat' which is attested as *suutz'* in Classic Mayan, indicating that **o'>oo* took place before proto-Ch'olan **oo>uu* raising.

Tseltalan languages lost preconsonantal glottal stops, but did not undergo the same raising of long mid vowels as in Ch'olan (Houston et al. 1998: 289); proto-Mayan **so'tz'* 'bat' became *sots'* in Modern Tsotsil (Delgaty and Ruíz Sánchez 1978: 124). Parsimony suggests that the glottal stop was lost in proto-Ch'olan-Tseltalan (i.e. **V'>VV* had already taken place), since the stop is not preserved in any Ch'olan-Tseltalan descendant language.

Based on Houston et al.'s (1998) sound change rule, proto-(Central) Mayan **-e-'m* would have become proto-Ch'olan-Tseltalan **-eem~-een*. All Ch'olan-Tseltalan languages later lost vowel length. A close parallel that shows the progression of sound changes can be found in proto-Mayan **'ixi'm* 'corn, maize' (Kaufman and Justeson 2003: 1034), which became *ixiim* with a long vowel in Classic Mayan (Kettunen and Helmke 2020: 105)[18] and is now *ixim* in modern Ch'olan languages such as Ch'orti' (Hull 2016: 156).

[18] Evidence for a long vowel in Classic Mayan *ixiim* comes from spelling. Classic Mayan hieroglyphs could represent words phonetically using a syllabary. Kettunen and Helmke (2020: 105) cite the syllabic spelling of *ixiim* 'maize' as **'i-xi-ma**; according to both Houston et al. (1998: 286) and Lacadena and Wichmann (2004: 109), by convention, an unpronounced final <a> indicates that a preceding <i> is a long vowel.

3.1.2.3. Base attachment

Reflexes of **-e-'m* occur primarily with intransitive verbs in most Ch'olan-Tseltalan languages. In Ch'orti', Tsotsil, and especially Chontal, *-em~-en* can occur with transitive verbs in some circumstances. In such cases, the participle has a passive or mediopassive reading.

In (24) and (25) from Ch'orti', the *-em* participle is the main predicate of the sentence, while in (26), it acts as a secondary predicate to the verb *uyakta* 'he left it', modifying the noun phrase *uwich' ub'itor* 'the rim of the hat'.

CH'ORTI' (Hull 2016: 79, 321, 508)

(24) *B'ur-**em*** *nu-b'itor*
make.wet-PERF A1-hat
'My hat is wet.'

(25) *Xuy-**em*** *u-murur* *e* *ixik*
perforate-PERF A3-gourd DET woman
'The gourd of the woman has holes in it.'

(26) *E* *winik* *pak-**em*** *pak-**em*** *uy-akta* *u-wich'* *u-b'itor…*
DET man fold-PERF fold-PERF A3-leave A3-rim A3-hat
'The man left the rim of his hat fully folded down…'

As shown in the above representative examples, when *-em* is used with a transitive root, it normally describes a resultant state of an object without reference to an agent that caused that state, more like a mediopassive than a true passive. For example, (24) describes the wetness of the hat without saying who made it wet, and (25) focuses on the perforatedness of the gourd without any reference to what caused this state. (26) references the agent, the man who left the brim of his hat folded, but grammatically,

pakem ‘folded’ is acting as an adjective that describes the brim of the hat; the man is not the demoted agent of *pakem* (compare a true passive sentence: ‘The rim of the hat was folded down by the man’). If these participles are acting as mediopassive constructions, this could explain why the normally intransitive *-em* suffix is appearing here with transitive verbs instead of the passive participle (*-b’ir* in Ch’orti’).

An exception to the above generalization is shown in (27), where *umen e maxtak* ‘by the children’ indicates the agent of the throwing. Note that *jur* ‘throw’ here means something more like ‘throw (at)’; the tree (and not the rocks) is the grammatical object.

CH’ORTI’ (Hull 2016: 182)

(27)

*Jur-**em***	*jur-**em***	*u’t*	*e*	*te’*	*taka*	*e*	*tun*
throw-PERF	throw-PERF	bark	DET	tree	with	DET	rock
umen	***e***	***maxtak***					
by	DET	children					

‘The surface of the tree was really thrown at with rocks **by the children**.’

Tsotsil allows *-em* with transitive verbs. Like most of the Ch’orti’ examples above, *-em* has a mediopassive reading in such cases: it describes the result of a prior event that had no agent (28a). This contrasts with passive participle *-b’il* which implies an agent, albeit unspecified (28b), and the adjectivizing suffix *-Vl* which indicates a state without reference to the precipitating event (28c). (*-b’il* and *-Vl* will be discussed in sections 4.2.2 and 4.2.4 respectively.)

TSOTSIL (Haviland 1981: 258)

(28) a. *Mak-**em*** *li* *na* *e*.
close-PERF DET house PH.FIN
'The house is closed' (and closed by itself or as a result of an impersonal process)

b. *Mak-**b'il*** *li* *na* *e*.
close-PERF DET house PH.FIN
'The house is closed' (and a nonspecific agent did it)

c. *Mak-**al*** *li* *na* *e*.
close-PERF DET house PH.FIN
'The house is closed' (the condition of being closed)

In Chontal, *-en* is actually more productive with transitive verbs than with intransitive verbs; it occurs with only a small set of intransitive verbs and nouns (Knowles 1984: 256-257). Examples are shown in (21) above. As in Ch'orti', when attached to a transitive verb, *-en* yields a passive reading, focusing on the object of the action (e.g. *pok-en* 'washed' from *pok-* 'to scrub').

The question of how *-em~-en* participles are interpreted with transitive verbs deserves more substantial synchronic work. From a diachronic view, what is clear is that *-em~-en* fundamentally attaches to intransitive bases, even though under some circumstances it can be extended to transitive verbs with a passive or mediopassive meaning. Because this extension to transitive verbs happens in Ch'orti', Chontal, and Tsotsil, it probably reconstructs to proto-Ch'olan-Tseltalan. In the majority of clearly passive contexts, Ch'olan-Tseltalan languages use a reflex of **-b'il* (section 4.2.2.3).

3.1.3. *-a'an* in Yucatecan languages

The *-a'an* participial suffix is ubiquitous in Yucatecan languages, where it attaches to transitive and intransitive verbs and to positional roots. No other Mayan subgroup uses *-a'an* with verbal bases, though other subgroups create positional stative participles using an *-an* suffix, which Kaufman (2015) treats as cognate with *-a'an*. The use of *-a'an* with verbs is clearly a Yucatecan innovation, and in this section I show that a proto-Yucatecan positional stative participle **-a'an* is the most likely source. I leave it as an open question whether proto-Yucatecan **-a'an* is cognate with *-Vn* positional suffixes in other Mayan languages, as the phonology does not perfectly correspond.

Writing about Itzaj, Hofling calls *-a'an* a "general participle" which can attach to many types of bases, and notes that it "may have passive and/or perfect senses" (Hofling with Tesucún 2000: 165). The perfect meaning is most prominent with intransitive roots (29a) or derived intransitive stems such as passives or inchoatives (29b-c). *-a'an* participles have a passive reading with transitive stems (29d-e).

ITZAJ (Hofling with Tesucún 2000: 165-168)

(29) a. *tal-**a'an***
come-PTCP
'has come'

b. *xup-p-aj-**a'an*** '(has been) spent'
spend-PAS-TV-PTCP
'(has been) spent'

c. *chich-aj-**a'an***
hard-COM-PTCP
'(has) hardened'

d. *chuy-**a'an***
sew-PTCP
'sewn'

e. *b'i-s-äj-**a'an***
go-CAUS-TV-PTCP
'(has been) carried'

Hofling notes that with positional roots as in (30a), *-a'an* lacks a perfect or passive reading; these seem to have more of a simple stative meaning. However, the suffix does have a perfect reading on intransitive stems derived from positional roots (30b).

ITZAJ (Hofling with Tesucún 2000: 167-168)

(30) a. *jäw-**a'an***
face.up-PTCP
'lying face up'

b. *jäj-l-aj-**a'an***
face.up-IV-COM-PTCP
'has been set face up', 'has been sitting face up'

The alternation between (30a) and (30b) makes sense if the suffix's basic function is to describe states. As discussed in sections 1.4 and 2.2.1, one major use of "perfect aspect" is to describe the resulting state of an entity after an event. Positional roots are not inherently eventive, and so the *-a'an* participle simply targets the position of the subject, without any entailment of a prior event that led to that position. By contrast, intransitive stems derived from positional roots as in (30b) do entail an event wherein the entity assumed or was placed in a given position, and so *-a'an* targets the result state of that event.

-a'an can attach to antipassive stems derived from the older transitive perfect suffix *-maj*, as shown in example (31), or even directly to *-maj* as in (32) (for more discussion about Yucatecan *-maj*, see section 5.4). In such cases, the participle does not have a passive reading.

ITZAJ (Hofling with Tesucún 2000: 169-170)
(31) *b'o'ol-**maj**-n-aj-**a'an***
pay-PERF-AP-COM-PTCP
'has paid, has been a paymaster'

(32) *litz-**maj-a'an***
fish-PERF-PTCP
'has been a fisher, has fished'

The use of *-a'an* as a perfect participle is innovative, as it is only found within Yucatecan. The order of morphemes also suggests that *-a'an* is a younger suffix, as it may be very far from the root, contrasting with the etymologically older suffix *-maj* which attaches directly to the root, as in (31-32).

Kaufman treats *-a'an* as a reflex of the **-V_Rl* ~ **-a'n* (or **-aan*) 'stative' derivation of positional roots, extended to verbal bases (2015: 399). Many Mayan languages create stative predicates of positional roots using a suffix *-Vl,* dissimilating to *-an* when the root ends in /l/ (see 33 from Uspanteko). This suffix is regularized to *-an* across the board in Q'anjob'alan languages (Kaufman 2015: 405; cf. example 34 from Q'anjob'al), and the same could have happened in Yucatecan. However, if *-a'an* is cognate with the positional suffixes in other Mayan languages, it is the only reflex to have a glottal stop, where the vowel has only a short vowel in all other subgroups.

Depending on which of Kaufman's two reconstructions one assumes, either the proto-Mayan suffix was *-*aan* and gained a glottal stop in Yucatecan languages, or it was originally *-*a'n* which lost the glottal stop and became a short vowel in all other groups. This is not a regular correspondence in either direction, which casts the hypothesis of a cognate relationship into doubt.

USPANTEKO (Can Pixabaj 2007: 112)

(33)	a.	*ch'uk-**úl**-ik*	'squatting, sitting on one's heels'
	b.	*lek-**él**-ik*	'lifted up'
	c.	*wa'-**l**-ik*	'standing'
	d.	*tzal-**án**-ik*	'to one side'

Q'ANJOB'AL (CLQ 2005: 121; Mateo Toledo 2008: 175, 350)

(34)	a.	*tz'ey-**an***	'inclined'
	b.	*wah-**an***	'standing'
	c.	*tel-**an***	'lying down'
	d.	*k'ol-**an***	'round'

Whether or not *-a'an* is cognate with *-Vn* positional stative suffixes in other branches as in Kaufman's analysis, the fact remains that *-a'an* may appear with both positional and verbal bases (as shown in the above examples from Itzaj). Minimally, we can say that *-*a'an* reconstructs to proto-Yucatecan as a participle of positional roots and verbal bases. The lack of non-Yucatecan cognates occurring with verbal bases suggests that the positional stative may have been the original use of the suffix and that it was later extended to verbs; such an extension is semantically plausible given the close connection between the "stative" and "resultative perfect" meanings, as discussed above. However, because of the phonological discrepancies between *-a'an* and non-Yucatecan positional

stative suffixes, this analysis requires more work to explain what the *-a'an* participle is cognate with.

Blair's (1964) grammar takes a different approach, treating Yucatec *-a'an* as a combination of two suffixes, *-a'a* and *-n* (35). He notes that *-n* never appears by itself with intransitive verbs, but he connects *-a'a* to participles that appear with an infixed glottal stop and before a *-Vl* suffix (Blair 1964: 85). (36) shows an example with Blair's proposed morpheme breakdown. He does not give the actual phonology of the word or a gloss (he refers to morphemes by number), so I have provided a suggested gloss based on his analysis in text. He also identifies the participle with an *-a'a* suffix that appears with transitive stems (37-38), though this seems to be primarily based on the overlap in form. The more recent Yucatecan sources I consulted do not pursue Blair's breakdown of *-a'an*, so I do not discuss it further here.

YUCATEC (Blair 1964: 84-85, 98, 102)

(35) *lub'-**a'a**-**n**-en*
fall-PTCP-PTCP-B1S
'I have fallen, I am fallen'

(36) *tz'o<**V'V**>n-Ø-Vl*
shoot<PTCP>-B3S-PTCP
'it is shot'

(37) *jàn-t-**a'a**-b'-i*
eat-TV-?-PAS-IV.SUF
'it was eaten'

(38) *b'ey kím-s-**a'a**-b'-il-ak-en*
how die-CAUS-?-PAS-NOM-PST-B1S
'thus I was killed'

3.1.4. *-Vl*

Several Mayan languages use a suffix of the general form *-Vl* to create participles of intransitive and transitive verbs. Uspanteko and Tojol-ab'al use *-V_Rl* and *-el* respectively to create perfect participles, while Yucatecan languages use *-V_Rl* (*-al* in Itzaj) to create deverbal adjectives that are not specifically labeled as perfects. Chol, Chontal, Tsotsil, Tseltal, Ixil, and Uspanteko additionally use a *-Vl* suffix to create participles of transitive roots. In section 4.2.4, I cover *-Vl* participial suffixes in depth; I summarize my analysis here.

Because the suffix is so widespread, it is tempting to reconstruct it to proto-Mayan. However, there is clear evidence for reconstructing **-i-naq* to proto-Mayan as the intransitive perfect suffix, and all of the languages that have *-Vl* either belong to the Ch'olan-Tseltalan branch or are known to have been in contact with the Ch'olan-Tseltalan branch, so that it makes the most sense to treat the *-Vl* perfect as an innovation that spread through contact.

Proto-Mayan had a **-V_Rl* suffix that created non-eventive "stative participles" from positional roots. These participles indicated the position or shape of the noun they modified, without entailing a precipitating event. Proto-Ch'olan-Tseltalan extended this suffix to transitive roots; in proto-Ch'olan-Tseltalan, the **-V_Rl* non-eventive "stative participle" contrasted with the **-b'il* "perfect participle" which does entail a prior event, a situation preserved in modern Tsotsil and Tseltal. In Chol and Chontal, *-V_Rl* wholly replaced **-b'il* as the perfect participle of transitive verbs. The use of a *-Vl* participial

suffix spread to Ixil, Uspanteko, and Yucatecan languages. By contrast, Tojol-ab'al's intransitive perfect participle *-el* does not have a strong connection to the Ch'olan-Tseltalan *-V_Rl* stative participle; instead, it seems to be an extension of the *-el* intransitive infinitive suffix. The relationships among deverbal *-Vl* suffixes in Mayan languages deserve further study.

3.1.5. *-lam* in Poqom

Poqomchi' and Poqomam have a semiproductive participial suffix *-lam* that appears with a restricted set of intransitive verbs, the majority of which are passive stems containing a historical *-h-* intransitivizing infix. The suffix is unique to the Poqom subgroup. This section describes the distribution of *-lam* and offers hypotheses about its origin, though at present there is not enough historical attestation to move beyond speculation to a conclusive answer about its origin.

In Poqomchi', the *-lam* suffix appears only with intransitive verbs that have been derived from transitive verbs by the intransitivizing infix *-h-*. The three examples in (39) are the only examples I am aware of.

POQOMCHI' (Mó Isém 2006: 214; Mó Isém 2007b: 89)

(39) a. *k'a<h>t-**lam***
burn<IV>-PERF
'burned up'

b. *k'u<h>t-**lam***
show<IV>-PERF
'indubitable, undeniable'

c. *uht-**lam***
worsen.sickness-PERF
‘worsened (of health)’

Poqomam uses *-lam* more productively. Benito Pérez (2007: 36) still calls it semiproductive, but it can occur with intransitive roots (40a-b) as well as intransitive verbs derived from transitive roots (40c-e), and in one case directly attaches to a transitive root (40f).

POQOMAM (Benito Pérez 2007: 36-37)

(40) a. *qaj-lam*
go.down-PERF
‘(has) descended’

b. *b’ej-lam*
walk-PERF
‘(has) walked’

c. *joot-lam*
raise.up.PAS-PERF
‘(has) gone up’

d. *saach-lam*
lose.PAS-PERF
‘lost’

e. *k’aat-lam*
burn.PAS-PERF
‘burned up, toasted’

f. *q’eb’-lam*
throw.away-PERF
‘thrown away, fallen’

While the *-h-* intransitivizing infix does not appear in these examples, the long vowel of the passivized stems *joot* 'be raised up', *saach* 'be lost', and *k'aat* 'be burned' in examples (40c-e) corresponds to a short vowel plus infixed *-h-* in Poqomchi' (*joht, sahch, k'aht*) (Dobbels 2003: 234, 316, 597). Note especially that example (40e) corresponds to (39a) from Poqomchi'. Nearly all of the examples that come from transitive roots have long vowels, indicating that they originally had the *-h-* infix which was lost with compensatory lengthening.[19] The exception to this is (40f) where the transitive verb *q'eb'* 'throw away' occurs with a short vowel, the active transitive form, rather than with a long vowel or *-h-* infix which would indicate passivization (cf. Poqomchi' *q'ehb-* 'to fall, be lost', Dobbels 2003: 545).

I am uncertain of the origin of the *-lam* suffix, as it is not fully productive in Poqom and is absent from other Mayan languages. Ending in /m/ suggests a relationship to the transitive perfect participle suffix *-m*, which is productive in Poqom; *-la* may form some kind of transitive verbal base to which *-m* attaches. In both Poqomchi' and Poqomam, the *-h-* infix commonly derives intransitive verbs from positional roots (Mó Isém 2007b: 75, Benito Pérez 2007: 59). As illustrated in (41) below, these infixed stems may take various transitivizing suffixes, each of which derives a particular kind of transitive base (in this case *-ee* 'durative').

[19] The loss of preconsonantal *h* with compensatory lengthening is a feature of the Palín variety of Poqomam; other Poqomam and Poqomchi' varieties retain preconsonantal *h* (Malchic Nicolás et al. 2000: 42).

POQOMCHI' (Mó Isém 2006: 264)
(41) *x-Ø-i-pe<**h**>r-**ee**-j*
COM-B3S-A3S-flat<IV>-TV.DUR-DTV.SUF
'he/she held a flat object'

-la may have originally been one such transitivizing suffix, attaching to *-h*-infixed intransitive stems, and then later fused with the *-m* perfect to create a new participle. Alternatively, this may somehow be related to the *-V_Rl* suffix that derives participles from mediopassive stems in Yucatecan languages (section 3.1.4 above). More data (from Poqom colonial texts or detailed comparative work) may shed more light on *-lam.*

Note that *-h*-infixed positional roots themselves in Poqomchi' take *-$V_R$naq* as their perfect participle rather than *-lam* (42). All of the derived intransitive stems in Poqom that take *-lam* originally come from transitive verbs rather than positionals.

POQOMCHI' (Mó Isém 2006: 270)
(42) *chu<h>n-unaq*
seated<IV>-PERF
'he/she has sat down'

3.1.6. *-y(aj)* in Ixil

In Ixil, the suffix *-y(aj)* marks perfect aspect of intransitive verbs. The full form *-yaj* appears when the verb is clause-final. Like its transitive counterpart *-l(a')* (section 4.2.4.2), *-y(aj)* can occur with verbal predicates alongside the cessive aspect proclitic *qat=*, as shown in (43). Adell indicates that *-l(a')* and *-y(aj)* can also appear in non-verbal predicates without TAM proclitics (Adell 2019: 269). The distribution of *-y(aj)* contrasts

with the intransitive "stative resultative" suffix *-na'q* (<*-*i-naq*) which exclusively occurs in non-verbal predicates (Adell 2019: 444).

IXIL (CHAJUL) (Adell 2019: 269)

(43) a. *qat=ya'-**y**=vet* *u=nim-la-q'ij*
CESS=finish-PERF=PRCN DET=big-ATTR-day
'Now the celebration has ended.'

b. *qat=ya'-**yaj***
CESS=finish-PERF
'It has ended.'

A possible correlate is found in Classic Mayan hieroglyphs.[20] Verbs in Classic Mayan frequently end in a morpheme *-iiy* which has been analyzed with a temporal meaning. Wald (2004) treats *-(ij)iiy* as an adverbial enclitic which refers to a prior event relative to some other event foregrounded in the discourse, similar to English "ago" or "after" (Wald 2004: 256). Robertson et al. (2004) trace *-iiy* to a proto-Mayan suffix **-eer* which indicates past reference on time adverbials: Classic Mayan preserves this use in examples such as *waxak-ij-iiy* 'eight days ago' (from *waxak* 'eight') (2004: 264). In their view, *-iiy* was extended to become a past tense marker for Classic Mayan verbs (Robertson et al. 2004: 269). While the two analyses ascribe slightly different semantics to *-iiy*, they agree that it refers to events that are temporally prior to some vantage point.

Given the other evidence for Ch'olan influence on Ixil (Wichmann and Brown 2003), this *-iiy* suffix may be a good candidate as a source for Ixil *-y(aj)*. If so, the adverbial origin of the suffix may explain why it acts more like an inflectional morpheme

[20] Danny Law (p.c.) originally suggested this connection.

in Chajul Ixil, contrasting with the derivational *-na(')q* stative participle suffix. Note that if *-y(aj)* is related to Ch'olan *-iiy*, it must be a borrowing, not a shared retention of proto-Mayan **-eer*; like other Mamean languages, Ixil underwent **r>t* (Campbell 2017: 49) while Ch'olan-Tseltalan languages underwent **r>y* (Kaufman and Norman 1984: 83).

3.2. SUMMARY

This chapter has investigated perfect suffixes that appear with intransitive verbs in Mayan languages. The proto-Mayan reconstruction is relatively clear-cut: I reconstruct **-i-naq* as the proto-Mayan intransitive perfect suffix, due to its ubiquity across the family outside of Ch'olan-Tseltalan and Yucatecan languages. Two other suffixes, *-em~-en* and *-Vl,* are less widespread, but their distribution crosscuts multiple subgroups, likely as a result of language contact. Proto-Ch'olan-Tseltalan replaced **-i-naq* with an innovative perfect marker **-eem~-een*, an extension of the proto-Central Mayan intransitive gerund suffix **-e-'m*; the related form *-en* in Mopan and Colonial Yucatec, I assume to be a borrowing from Ch'olan. A *-Vl* participle suffix appears with intransitive verbs in Yucatecan languages, Tojol-ab'al, and Uspanteko; for Yucatecan and Uspanteko, contact with Ch'olan languages once again seems to be a driving factor, while Tojol-ab'al may have innovated *-el* separately based on an action nominalization.

Other less common suffixes are clearly innovations with a much more restricted distribution. Proto-Yucatecan extended the positional stative suffix **-a'an* to create

perfect participles from intransitive verbs, as well as passive perfect participles from transitive verbs. *-lam* is limited to Poqom, while *-y(aj)* in Ixil seems to derive from an *-iiy* past time suffix in Classic Mayan. The next chapter turns to perfect marking on transitive verbs, where widespread language contact and the interaction between active and passive forms have made the distribution much more complicated.

Chapter 4: Perfect marking of transitive verbs

4.1. INTRODUCTION

This chapter discusses morphemes that mark perfect aspect on transitive verbs, including root transitive verbs (RTVs) and derived transitive verbs (DTVs). Unlike intransitive verbs which were discussed in chapter 3, voice is relevant for understanding transitive perfects. Transitive verb stems may appear in active voice, marking both an agent and patient; passive voice, where the verb becomes intransitive and the patient functions as the grammatical subject; and antipassive voice, where the agent becomes an intransitive subject. Many Mayan languages have an additional "Agent Focus" derivation, which superficially looks like an antipassive in that it emphasizes the agent and makes the verb morphologically intransitive, but this form differs from a true antipassive in that the patient remains a full argument and the verb can agree with either the agent or patient. For an overview of the Agent Focus construction, see Stiebels (2006).

Normally, a transitive verb will be passivized or antipassivized using an intransitivizing suffix, and if the resulting stem takes any additional morphology, it follows the pattern of an intransitive verb. I illustrate this here with examples from K'iche': in active voice, the transitive root *muq* 'bury' in (1a) is marked with the transitive category suffix *-o/u* and takes agreement markers for both a subject and object. The passive stem in (1b), formed in this case by lengthening the root vowel, takes the

intransitive category suffix *-ik* and references the patient as its single argument. The antipassive in (1c) (shown with the root *mes-* 'sweep') likewise takes *-ik* and references only a single argument like any other intransitive verb.

K'ICHE' (Larsen 1988: 251, 259)

(1) a. *x=Ø=uu-muq-u* (Active)
COM=B3S=A3S-bury-RTV.SUF
's/he buried him/her/it'

b. *x=Ø=muuq-ik* (Passive)
COM=B3S=bury.PAS-IV.SUF
'he/she/it was buried'

c. *ka=Ø=mes-on-ik* (Antipassive)
INC=B3S=sweep-AP-IV.SUF
's/he sweeps'

This general pattern holds for antipassive perfect participles as well: in (2) below from Sakapultek, the antipassive stem *koj-on-* 'believe' takes the intransitive perfect suffix *-naq*.[21] More specialized detransitivizing suffixes, such as the *-taj* "completive passive" in (3), also occur with the intransitive perfect suffix.

SAKAPULTEK (Mó Isém 2007a: 98, 176)

(2) *Che* *at* *koj-on-**naq*** *wii'*
PART B2S believe-AP-PERF PART
'Where have you believed?' (i.e. 'What religion…')

[21] Kaqchikel and Tz'utujil are unique in having a dedicated "agent focus perfect participle," discussed in section 4.2.5.3, while Teenek has the unique form *-aamath* that attaches to antipassive suffixes (examples 27c-d below on page 146).

(3) *l-a'laab'* *Ø-Ø-k'ul-ub'* *r-ik'in*
ART-young.man COM-B3S-join-IV A3S-RN.with
*q'ap-taj-**naq*** *aliit*
break-COM.PAS-PERF girl
'The young man married the girl who was broken (in her foot, hand, or other body part)'

However, passive perfect participles normally take a distinct form from the intransitive perfect, sometimes even taking an identical suffix to that of the active transitive verb. In (4-5) from K'iche', the perfect suffix *-oom/-uum* attaches directly to the verb root in active or passive voice. The only morphological difference between the active and passive perfect constructions in K'iche' is that the active perfect agrees with both an agent and patient, while the passive perfect agrees only with the patient (its grammatical subject). If the passive perfect in (5) behaved like other verbal inflections, one would expect the root to be derived as its passive stem *muuq-* (cf. 1b above) and to take the intransitive perfect suffix *-(i)naq*.[22]

K'ICHE' (Larsen 1988: 236)
(4) *at* *nu-ch'ay-**oom*** (Active)
B2S A1S-hit-PERF
'I have hit you'

(5) *e'* *muq-**uum*** (Passive)
B3P bury-PERF
'They are buried; they have been buried'

[22] Mondloch lists one apparent counterexample *alaxnaq* 'has been born' in K'iche', where the DTV *ala-* 'to birth' is derived with the simple passive suffix *-x* before taking the intransitive perfect *-naq*. However, he claims that the passive stem *alax-* 'to be born' here has simply been lexicalized as an intransitive root (Mondloch 1981: 337).

Because active and passive perfect forms are often closely linked, in this chapter, I consider both. Table 11 repeats the portion of Table 8 having to do with transitive verbs. It shows active and passive perfect forms of transitive verbs, divided into RTVs and DTVs.

Branch	Language	Active		Passive	
		RTV	DTV	RTV	DTV
K'iche'an	K'iche'	*-oom/-uum*	*-V_1m*	*-oom/-uum*	*-V_1m*
	Achi	*-oom/-uum*	*-m*	*-oom/-uum*	*-m*
	Kaqchikel	*-om/-um ~ -on/-un*	*-m ~ -n*	*-om/-um ~ -on/-un*	*-m ~ -n*
	Tz'utujil	*-oon/-uun*	*-V_1n*	*-oon/-uun*	*-V_1n*
	Sakapultek	*-V_Rm(aj)*	*-m(aj)*	*-V_Rm(aj)*	*-m(aj)*
	Sipakapense	*-maj*	*-maj*	*-maj*	*-maj*
	Poqomam	*-om/-um*	*-m*	*-ooj/-uuj*	*-(a)maj*
	Poqomchi'	*-om ~ -V_Rm*	*-m*	*-ooj/-uuj, -(V_R)maj*	*-maj*
	Uspanteko	*-oom*[23]	*-V_1m*[23]	*-V_Rl, -oom*[23]	*-l*
	Q'eqchi'	*-om*[23]	*-m*[23]	*-b'il*	*-mb'il*[23]
Mamean	Mam	*oo-taq, maa-taq*	*oo-taq, maa-taq*	*-'n(-maj), -na(j), -aj*	*-'n(-maj), -na(j), -aj*
	Tektiteko	*matx, (o)je=tq*	*(o)je=tq*	*-' ~ -m; -o-'n, -maj, -naq***	*-' ~ -m; -o-'n, -maj*
	Awakateko	*-naq*	*-naq*	*-ij; -ijt*	*-Vnt*
	Chalchiteko	ND	ND	*-ij*	ND
	Ixil	*-l(a')*	*-l(a')*	*-l(a'), -el*	*-l(a'), -mal*
Q'anjob'alan	Q'anjob'al			*-b'il*	*-b'il*
	Akateko	*-b'il*	*-b'il*	*-b'il*	*-b'il*
	Popti'			*-b'il*	*-b'il*
	Mocho'	ND	ND	*-ob'aal*	*-ob'aal*

[23] The *-(V)m* forms in Uspanteko and Q'eqchi' are based on preliminary survey data (Kaufman 1976b: 77); a *-Vm* perfect construction is not mentioned at all in more recent descriptive grammars of either language.

	Chuj	*-nak*	*-nak*	*-b'il, -nak*	*-b'il*
	Tojol-ab'al	*-unej ~ -uj*	*-unej ~ -uj*	*-ub'al*	*-ub'al*
Tseltalan	Tseltal	*-oj*	*-ej*	*-bil*	*-bil*
	Tsotsil	*-oj*	*-oj*	*-bil*	*-bil*
Ch'olan	Chol			*-V_Rl*	*-bil*
	Chontal	*san/jan*	*san/jan*	*-el, -V(l) ~ -V'*	*-bi(l), -äl*
	Cholti'			*-b'il*	ND
	Ch'orti'			*-b'ir*	*-b'ir*
Yucatecan	Yucatec	*-m-aj*	*-m-aj*	*-b'il, -a'an*	*-b'il, -a'an*
	Itzaj	*-m-aj*	*-m-aj*	*-b'il, -a'an*	*-b'il, -a'an*
	Mopan			*-b'il, -a'an*	*-b'il, -a'an*
	Lacandon	*-m-an ~ -m-än*	*-m-an ~ -m-än*	*-b'il~-b'äl, -a'an*	*-b'il~-b'äl, -a'an*
Wastekan	Teenek	*-aam-al*	*-aam-al*	*-aam-ej,*	*-aam-ej,*
	Chicomuseltec	ND	ND	ND	ND

Table 11: Active and passive transitive perfect suffixes in Mayan languages.

Several distinct suffixes appear in Table 11 as perfect markers of transitive verbs. A suffix of the general form *-Vm* or *-Vn* is widespread in Eastern Mayan, Yucatecan (except Mopan which appears to lack an active perfect), and Teenek, sometimes taking further suffixation as in *-m-aj* (several), *-m-an* (Lacandon) or *-aam-al* (Teenek). A passive perfect participle suffix *-b'il* is similarly widespread. To anticipate the major discussion points of sections 4.3 and 4.4, *-Vm* consistently appears across the family in active transitive contexts and undoubtedly reconstructs to proto-Mayan as the active perfect marker. Passive perfect participles are a nearly even split between *-Vm* and *-b'il*, and while there is a case to be made for either, in this chapter I argue that **-o-'m* marked both

the active and passive perfect participle in proto-Mayan, while *-b'il* was innovated later and spread through contact.

Awakateko, Chuj, and Tojolab'al use *-naq*, *-nak*, and *-unej* respectively as active transitive perfect suffixes. All three are descendants of **-i-naq* which was discussed in chapter 3 as an intransitive perfect participle. Yucatecan languages can use the participial suffix *-a'an*, also discussed in chapter 3, in passive contexts. A few languages use a *-Vj* or *-Vl* suffix in perfect constructions, while Teenek has the unique resultative participles *-th, -tx, -at*. Mam, Tektiteko, and Chontal innovated preverbal perfect aspect particles.

This chapter proceeds as follows. In section 4.2, I discuss the individual distribution and reconstruction of each perfect morpheme that occurs with transitive verbs. In section 4.3, I justify reconstructing **(-o)-'m* to proto-Mayan as the perfect marker of active transitive verbs and discuss why I reject Kaufman's (2015: 319) reconstruction of **-o-ej* "active perfect participle/gerund" as a deverbal counterpart to **(-o)-'m*. In section 4.4, I discuss the reconstruction of the passive perfect participle, arguing that **(-o)-'m* should also be reconstructed as the passive perfect participle, contrary to Kaufman's (2015: 319) reconstruction of **-b'il*. I will argue that **-b'il* (or **-b'Vl*) was a later Western Mayan innovation that spread to other branches by contact. Section 4.5 summarizes.

4.2. DISCUSSION BY MORPHEME

This section individually discusses each of the perfect suffixes that occurs with transitive verbs in Mayan languages. I also briefly discuss preverbal perfect aspect morphemes: *oo-taq* and *maa-taq* in Mam (England 1983: 306), Tektiteko particles *oje(=tq)* and *matx* (Stevenson 1987: 29), and Chontal *san/jan* (Vinogradov 2018: 271), though these are all limited to one or two languages and are clearly innovative.

4.2.1. *(-o)-'m*

A perfect suffix of the general form *-Vm* appears in Teenek, Yucatecan, and Eastern Mayan, and reconstructs to proto-Mayan as **-o-'m* with transitive roots and **-'m* with derived transitive verbs. Yucatecan and many Eastern Mayan languages use the form *-maj*, an innovative reflex of **-o-'m*; the distribution of *-maj* is complex enough that I treat it separately in chapter 5. Possible non-perfect reflexes of **-o-'m* appear in Chontal and in varieties of Q'anjob'al.

**(-o)-'m* clearly occurred in active perfect contexts in proto-Mayan, but there is a question as to whether proto-Mayan used it as a passive perfect participle, or if **-b'il* had this function. In this section I focus on identifying cognate suffixes and reconstructing the form, while section 4.4 will address the question of the passive perfect participle.

4.2.1.1. Cognacy questions

The clearest reflexes of **-o-'m* are those that are labeled as perfect suffixes and appear with transitive verbs; this includes *-aam* in Teenek, *-maj* in Yucatecan languages, and *-Vm* or *-Vn* suffixes in K'iche'an and Mamean languages. (I cover the phonological variation among these suffixes in the next section.) This section discusses several suffixes that share a similar form and plausibly similar meaning, but are not labeled as perfect suffixes in the sources consulted.

Besides the *-aam* perfect suffix, South Eastern Teenek has a phonologically similar "stative participle" suffix *-VVm* (6-8), which does not occur in other varieties of Teenek (2012: 104). This has a different distribution from the *-aam* perfect suffix, an example of which is shown in (9). Their forms differ: the perfect suffix is always *-aam*, while the vowel of the stative participle can vary (Kondić does not indicate whether the allomorphy is predictable or lexically specified). The Teenek perfect is followed by the suffixes *-al*, *-ej*, or *-ath* to indicate active, passive, or antipassive voice, while the stative participle takes *-tej* in passive voice (Kondić 2012: 95-96). The stative participle is often translated with a progressive meaning, as shown in (6-8), rather than a perfect or resultative meaning.

TEENEK (SOUTH EASTERN) (Kondić 2012: 104-106, 129)

(6) a. *u* *jootxk-**iim***
A1 carry-STAT
'I carry'

b. *in* *jootxk-**iim**-tej*
B1 carry-STAT-PAS
'I am being carried'

(7) a. *in* *eeb-**oom***
A3 look.up-STAT
'He is looking up.'

b. *in* *eeb-**oom*** *wik*
A3 look.up-STAT PST
'He was looking up.'

(8) *i* *och'-**oom*** *k'ij* *taam* *an* *ti* *taal* *altxik* *an* *olip.*
A.P hear-STAT TNS when DEF SUB come.INC straight DEF stream
'They were listening attentively as it (coyote) was coming down the stream.'

(9) *in* *thutx-iy-**aamal*** *an* *kaarta.*
A3 write-TV-PERF.ACT DEF letter
'He has written the letter.'

More research needs to be done on the *-VVm* stative participle of South Eastern Teenek and its possible origins, but for purposes of this study, the meaning differs enough from the perfect that I do not consider it cognate.

Mamean languages have a suffix *-V'm* or *-V'n* that appears with transitive verbs in various types of dependent constructions. In Mam, *-V'n* marks perfect participles (10) but also appears on the main verb when it follows a directional particle (11). Tektiteko has the same pair of constructions (12-13); the directional suffix is normally *-'*, with one example of *-n* (Stevenson 1987: 48) while the perfect varies from *-'* ~ *-m* (Stevenson 1987: 97, Pérez Vail 2007: 159).

MAM (England 1983: 125, 175)

(10) *jaq-o-**’n*** *Ø-Ø-jaaw* *tzi* *n-k’a’-ya* *gasyoosa*
open-TH.V-PTCP PST.DEP-B3S-go.up mouth A1S-drink-1S carbonated
‘My soda is opened’ (lit. ‘Opened, the mouth of my drink went up’)

(11) *ma* *chi* *ku’-tz* *t-tzyu-**’n**-a*
REC B3P DIR.down-DIR.toward A2-grab-DIR-2S
‘you grabbed them’

TEKTITEKO (Stevenson 1987: 48, 97)

(12) *Ø* *xi* *j-q’oma-**’*** *na*
B3S go A1P-say-DIR EXCL
‘We (exclusive) said it.’

(13) *pwes* *w-etz* *k’onti’l tidi’* *k’u’uu-**’**-Ø* *w-itza’*
well A1S-PRO nothing keep-PTCP-B3S A3S-RN.by
‘Well, there is nothing that has been kept by me.’

-o’m in Ixil creates action nominalizations from transitive verbs (14), as does *-V’n* in Awakateko (15). Like Mam and Teko, Ixil and Awakateko have a corresponding nearly-homophonous perfect participle, though in both languages it is limited to DTVs: Awakatek has the passive participle *-Vn-t,* while Ixil has the resultative participle *-m-al* which appears as *-(’)m* prenominally (discussed below).

IXIL (Adell 2019: 379)

(14) *nik=i-tx’ol* *koj-**o’m***
INC=A3-be.able work.fields-NOM
‘They’re able to labor/work in the fields.’

AWAKATEKO (GN 227-228)

(15) a. *k’ay-**e’n*** ‘to sell’ < *k’ay-* ‘sell’
b. *qatz-**a’n*** ‘to break’ < *qatz-* ‘break’
c. *b’iy-**o’n*** ‘to hit’ < *b’iy-* ‘hit’

The variation between /m/ and /n/ word-finally can be attributed to a word-final **m>n* sound change in Mam, Tektiteko, and Awakateko (see the discussion of phonology in the next section) but the change in function is unexpected. For the present work, I take the homophony of the perfect and directional suffixes in Mam (and their near-homophony in other Mamean languages) as evidence that the two constructions are indeed historically related, but to explain the connection between them in a satisfying way will require a more detailed follow-up study focusing on the Mamean subgroup.

The Ixil suffix *-mal* creates "stative resultative" participles from derived transitive verbs. These participles behave as non-verbal predicates and are passive, as shown in (16). The root transitive equivalent is *-el* (section 4.2.4.2 below).

IXIL (CHAJUL) (Adell 2019: 447)

(16) *iq'o-**mal*** *inq'a=i-liivro* *naq*
bring-STAT DET.P=A3-book 3.MASC
'His books were already brought' (i.e. they were already there).

When *-mal* participles precede a noun, the suffix appears as *-m* (in Chajul) or *-'m* (in Nebaj), which Ayres notes is identical to the transitive action nominalization.

IXIL (NEBAJ) (Ayres 1991: 126)

(17) a. *u* *b'oxi-**'m*** *chib'*
DET grill-STAT meat
'the grilled meat'

b. *u* *eesa-**'m*** *puaj*
DET take.out-STAT money
'the money that has been taken out'

Ayres' examples strongly suggest that *-mal* stative resultative participles preserve a reflex of the **-'m* passive perfect of DTVs, combined with a *-Vl* suffix (likely related to *-el*, the RTV counterpart of *-mal*). Kaufman (2015: 288) also suggests this connection: his cognate table lists Ixil *-m-al* as a reflex of **-'m*. Like the perfect, *-mal* participles target a state resulting from a prior action. In Ixil, "perfect aspect" on transitive verbs is expressed by the innovative suffix *-l(a')*; unlike perfect constructions in other Mayan languages, Ixil perfects marked with *-l(a')* are very clearly verbal predicates, co-occurring with the *qat=* cessive aspect proclitic (Adell 2019: 268-269). The "stative resultative" participles in *-el* and *-mal* correspond more closely to the usage of perfect participles in other Mayan languages, which form non-verbal predicates and lack TAM marking (see sections 2.2.2 and 4.4.3).

Chontal has a suffix *-V_Rm* that creates adjectives from transitive verbs, positionals, nouns, and "unique constituents" (roots that are not attested in Chontal outside of this construction).

CHONTAL (Knowles 1984: 244)

(18)	a.	*kol-**om***	'empty'	< *kol-*	RTV 'to empty'
	b.	*tzuy-**um***	'thick (liquids)'	< *tzuy-*	RTV 'to thicken'
	c.	*kel-**em***	'peeled'	< *kel-*	DTV 'to peel'
	d.	*wol-**om***	'ball-shaped'	< *wol-*	POS 'to be in a ball'
	e.	*lot-**om***	'married'	< *lot*	N 'companion'
	f.	*tzäy-**äm***	'smooth, slippery'	< *tzäy*	unique constituent

These seem to be distinct from Chontal's *-en* (<**-e-'m*) perfect participle, which can occur with transitive and intransitive verbs and does not harmonize with the vowel of the

root (Knowles 1984: 256-257; see section 3.1.2.2). The -V_R*m* adjectivizing suffix behaves in a similar way to a passive perfect participle, creating a passive adjective from a transitive verb as shown in (18a-c). Anticipating my diachronic analysis in section 4.4, I suggest that Chontal -V_R*m* may be a remnant of the earlier **-o-'m* passive perfect participle, after it was replaced by **-b'il* in Ch'olan-Tseltalan languages.

The Soloma (Tz'uluma') and San Juan Ixcoy (Yichk'ox) varieties of Q'anjob'al have an *-om* passive suffix (not specifically perfect), shown in examples (19-21). Unlike perfect participles in Mayan, the *-om* passive is compatible with TAM particles marking completive, incompletive, or potential aspect.

Q'ANJOB'AL (SOLOMA) (Mateo Toledo 1998: 137, CLQ 2005: 63)

(19)	*Max*	*uqte-j-**om***	*no*	*tx'i'*	*y-uj*	*naq*	*winaq*
	COM	chase-TV.SUF-PAS	CLS.animal	dog	A3-RN.by	CLS.human	man

'The dog was chased by the man.'

(20)	*ch-ach*	*awte-j-**om***
	INC-B2S	call-TV.SUF-PAS

'You are called.'

(21)	*hoq-Ø*	*etne-j-**om***
	POT-B3	mistreat-TV.SUF-PAS

'You will be mistreated.'

This *-om* passive could be a reflex of the **(-o)-'m* passive perfect participle. This hypothesis is appealing because it is an easy jump for a passive perfect participle to become a verbal passive suffix: it was simply bleached of its perfect meaning so that it is now compatible with other tense-aspect categories, preserving only the passive meaning. Similarly, I argue that the *-maj* perfect participle became a passive suffix in Uspanteko

and Poqomchi' (section 5.3.1). One challenge to this hypothesis is the limited distribution: only two varieties of Q'anjob'al have the *-om* passive, and no other Q'anjob'al variety (nor any other Q'anjob'alan language) uses *-om* as a perfect participle. If this *-om* is a reflex of the perfect participle, then it is very much a relic feature: a holdout that only survived in these two municipalities out of all Q'anjob'alan-speaking communities.

Another possibility, which I reject here, is that *-om* is an extension of the *-om* agentive suffix (<proto-Mayan **-oom*), which is productive in Q'anjob'al, rather than the **(-o)-'m* perfect. Soloma Q'anjob'al *-om* can attach to intransitive verbs as a subject nominalization (22a-b) or to transitive verbs as an agent nominalization (22c-e). It is possible that in examples like (19), the *-om* agent nominalization is functioning as a patient nominalization, etymologically distinct from the *-oom/-uum/-m* patient nominalization in K'iche'.[24]

Q'ANJOB'AL (SOLOMA) (Mateo Toledo 1998: 136, 139)

(22) a. *si-w-**om***
firewood-IV-AGT
'firewood maker'

b. *bit-n-**om***
song-IV-AGT
'singer'

[24] Previously, I had entertained the possibility that the stem *uqte-j-* in (19) is already passive. In this analysis, the subject nominalization *-om* attaches to a passive stem to create a patient nominalization; *-om* contributes no passive meaning on its own. This would require *-j* to be functioning as a passive suffix, rather than the transitive category suffix that CLQ (2005: 63) glosses it as. Q'anjob'al does have an intransitivizing suffix *-j*, but this is normally used to create intransitive verbs from nouns or adjectives (CLQ 2005: 230), rather than passive stems of transitive verbs.

c. *kol-**om***
help-AGT
'collaborator'

d. *tx'aj-**om***
wash-AGT
'one who washes'

e. *tayne-**m*** *na* (<*tayne-j* 'take care of')
take.care-AGT house
'concierge', lit. 'one who takes care of a house'

However, under the agentive hypothesis, the phonology of passive *-om* is anomalous. When the *-om* agentive attaches to derived transitive verbs, it normally appears as just *-m*, replacing the transitive category suffix *-j* (22e), whereas in (19), *-om* attaches to the *-j* category suffix.[25] This discrepancy in phonology, as well as the inconsistency in voice between agentive *-om* and passive *-om*, leads me to prefer the analysis that passive *-om* is an extension of the passive perfect participle. There is not enough information to say why the extension of *-om* as a simple passive only occurred in Q'anjob'al and not in other Q'anjob'alan varieties.

In chapter 5, which discusses the *-maj* reflexes of **-o-'m*, I present a case that the *-maj* "completive passive" of Uspanteko and the *-mV_Rj* ~ *-maj* passive of Western Poqomchi' are cognate with the *-maj* perfect participle seen in Poqomchi' and other Eastern Mayan languages.

[25] It is worth noting that the Q'anjob'al pattern is itself different from how the perfect and agentive suffixes behave in other Mayan languages. In other languages, the perfect *-(V)m* normally gets its vowel from the preceding stem (see section 4.2.1.2), while the vowel of the agentive *-oom* seems to be an inherent part of the suffix and is normally preserved, even to the point of creating vowel hiatus in Popti': *xib'-te-om* 'one who scares' (Delgado Rojas et al. 2007: 51).

Finally, Q'eqchi' has an *-om* suffix that is almost certainly related to the **-o-'m* perfect, but the available descriptions of Q'eqchi' are inconsistent about its actual function. Kaufman (1976b) identifies Q'eqchi' *-(o)m* as an active perfect suffix (as noted in Table 11). No other description confirms the active perfect usage. Stewart (1980: 70; 2016: 65) and Tzoc (2003: 61) call *-om* an imperative: while 2nd person singular imperatives are unmarked, *-om* appears with 2nd person plural addressee, alongside *-aq* which he glosses as a future suffix (23).

Q'EQCHI' (Stewart 1980: 70)

(23) a. *il-Ø*
see-B3
'(May you) see it!'

b. *il-**om**-aq-Ø*
see-IMP-FUT-B3
'(May you pl.) see it!'

DeChicchis (2009: 66-67), by contrast, calls *-om* a "patientive" suffix, a meaning seen in (24). DeChicchis sees the patientive meaning in (23b) as well: rather than an imperative "(May you) see it!", he translates *ilomaq* as a passive optative sentence, "may it be seen," where *ilom* is a patient noun meaning "seen thing" and the optative meaning is derived from context (compare 23a where the bare root carries the optative meaning with no other affixation). I follow DeChicchis's analysis. Several dictionary examples from CLQq (2004) show the same patientive meaning, which is more consistent with the usage of *-om* seen in other Eastern Mayan languages (see example 84 below).

Q'EQCHI' (DeChicchis 2009: 66; CLQq 2004: 38, 47, 140)

(24) *x-bis-**om***
A3-measure-PAT
'that which he has measured'

(25) a. *b'ak'-**om***
tie-PAT
'something to be tied up'

b. *b'ich'-**om***
peel.fruit-PAT
'something (some fruit or vegetable) that has to be peeled'

b. *paq-**om***
carry.on.shoulders-PAT
'something to be carried on one's shoulders'

4.2.1.2. Phonological reconstruction

Kaufman (2015: 279) reconstructs the form **-o-'m* with RTVs and **-'m* with DTVs in proto-Mayan. **-'m* is the contentful part of the suffix, which attaches directly to the transitive stem vowel. The stem vowel is **-o* with RTVs and variable with DTVs. I essentially agree with this reconstruction, though like the reconstruction of **-i-naq* in section 3.1.1, it deserves unpacking, as Kaufman does not provide a detailed justification, only a description of the reflexes (2015: 288, 296). There are two main points of discrepancy across the cognate suffixes: the final consonant and the suffix/stem vowel (or absence thereof).

Some reflexes have another suffix appended, such as the *-m-aj* found in Yucatecan and Eastern Mayan, and the *-aam-al, -aam-ej, -aam-ath* reflexes in Teenek. I

cover *-maj* in chapter 5 and ultimately conclude that in Eastern Mayan, the additional *-aj* was originally a passive suffix, while in Yucatecan and Teenek, the *-aj* or *-ej* comes from a completive aspect suffix. The Teenek *-aam-al* and *-aam-ath* forms are unique in the family and have a within-Teenek derivation: *-Vth* creates participles (not specifically perfect) from transitive verbs (Kondić 2012: 102), while *-al* is the incompletive aspect suffix for active transitive verbs (Kondić 2012: 114).

The final consonant is straightforward: most reflexes have *m*. Only a few languages have a suffix ending in *n*: Tz'utujil, Mam, and Tektiteko. In each case, the most likely explanation is a word-final sound change **m>n*. In Tz'utujil, this is an irregular change, as *m* can appear word-finally in other contexts (Dayley 1985: 21). In Mam, a word-final **m>n* change appears in other words: proto-Mayan **'ixi'm* became Mam *ixi'n* 'corn' (compare to, e.g., Tsotsil *ixim*, Ixil *ixi'm*, and K'iche' *ixiim*; Kaufman and Justeson 2003: 1034-1035).

The suffix vowel is long in several of the reflexes (K'iche', Tz'utujil, Uspanteko, and Teenek). The allomorphy in K'iche' is especially well-described. For transitive roots in K'iche', the suffix manifests with a long *oo* vowel (26a), which varies to *uu* to harmonize with a root vowel *u* (26b), while for derived transitive verbs with a stem vowel, the stem vowel will lengthen (26c). Derived transitive verbs ending in the causative *-ob'a'* lose the final glottal stop (26d). With other glottal-stop-final suffixes such as the celeritive *-ala'*, the glottal stop is preserved and the stem vowel does not lengthen, but the stem vowel changes to *o* (26e).

K'ICHE' (Larsen 1988: 234, 242)

(26) a. *miq'-**oom*** 'heated'
b. *pus-**uum*** 'slit'
c. *kam-isaa-**m*** 'killed' (*kam-isa-* 'kill')
d. *q'oy-ob'aa-**m*** 'left in a lying position' (*q'oy-ob'a'-* 'cause to be lying down')
e. *ch'ay-al**o**'-**m*** 'hit rapidly' (*ch'ay-ala'-* 'hit rapidly')

In Teenek, the suffix vowel is always long *aa*, not only when it attaches to a transitive stem (27a-b) but also when it follows (intransitivizing) antipassive suffixes (27c-d).

TEENEK (SOUTH EASTERN) (Kondić 2012: 116)

(27) a. *ch'a'-y-**aamal***
buy-TV-PERF.ACT
'has bought'

b. *utx-**aamej***
tell-PERF.PAS
'have been told'

c. *thutx-m-**aamath***
write-AP-PERF.AP
'has written'

d. *aath-l-**aamath***
run-AP-PERF.AP
'has run'

In Mamean languages, by contrast, the suffix usually has a glottal stop before the final consonant, as in (28), though the glottal stop is elided in some cases (29). In Mam, the suffix is always preceded by a stem vowel (England 1983: 101, 124).

MAM (England 1983: 125)

(28) *jaq-o-**'n*** *Ø-Ø-jaaw* *tzi* *n-k'a'-ya* *gasyoosa*
open-TH.V-PERF PST.DEP-B3S-go.up mouth A1S-drink-1S carbonated
'My soda is opened' (lit. 'Opened, the mouth of my drink went up')

(29) *iiq-a-**n*** *nu'xh* *kyaqiil* *q'iij* *t-u'n* *t-txuu'*
carry-TH.V-PERF baby every day A3S-RN.by A3S-mother
'The baby is carried every day by her mother.'

The Tektiteko passive perfect participle has the form *-'*, varying to *-m* (Stevenson 1987: 97). Ixil and Awakateko action nominalizations in *-o'm* and *-V'n* (respectively) also contain the glottal stop, if these are accepted as cognate with the perfect (section 4.2.1.1), and the Ixil *-mal* stative resultative participle appears as *-'m* phrase-medially in the Nebaj variety or *-m* in the Chajul variety (Ayres 1991: 126).

Most likely, the Mamean glottal stop reconstructs to proto-Mayan. Deletion of a preconsonantal glottal stop is often accompanied by compensatory lengthening cross-linguistically, which accounts for the reflexes with long vowels as exemplified in K'iche': for RTVs with the stem vowel *-o*, **-o-'m* would have become *-oom* as in (26a-b), while for DTVs with a variable stem vowel, the deletion of the glottal stop would have caused the stem vowel to lengthen as in (26c-d). As above, compare Mam *ixi'n* 'corn', which has the preconsonantal glottal stop, to K'iche' *ixiim*, which has a long vowel (Kaufman and Justeson 2003: 1035).

The vowel quality is almost invariably /o/ with RTVs, varying to /u/ to harmonize with a root vowel /u/. The DTV version of the suffix either does not have its own vowel or matches the normal stem vowel of the verb. This contrast between the RTV and DTV forms makes sense within Kaufman's analysis of the perfect as a **-'m* suffix attaching to

a stem vowel, which is *-*o* with RTVs and variable with DTVs (Kaufman 2015: 278-279). As for the allomorphy within RTVs, it is common across the family for an /o/ vowel in a suffix to harmonize with /u/ in the root; this rule reconstructs at least to proto-Central Mayan, as it is present in both Q'anjob'alan and K'iche'an languages (Day 1973: 18, Smith-Stark 1983: 134, among others). The same pattern of allomorphy appears in other derivational suffixes such as the Tz'utujil agentive, which is *-ool/-uul* with RTVs and -*l* with DTVs (Dayley 1985: 181). In Sakapultek and Poqomchi', the RTV perfect suffix nearly always assimilates to the root vowel. Teenek uniquely has invariant /a/; I am uncertain what led to the change in Teenek. More research needs to be done on stem vowels that occur with derivational suffixes across Mayan languages.

It will be noted that proto-Mayan **(-o)-'m* is phonologically similar to the proto-Central Mayan form **-e-'m*, which reconstructs as an action nominalization of intransitive verbs, but which evolved to mark perfect participles in Ch'olan-Tseltalan languages (see section 3.1.2). In both cases, **-'m* is the part of the suffix that conveys the primary meaning, and the vowel variation can be attributed to fusion with a stem vowel. I am not satisfied as to whether these suffixes have the same source or are merely homophonous; while I reconstruct them with different functions, they overlap quite a bit diachronically (both have reflexes as action nominalizations and as perfect participles). Kaufman, for his part, refers to them as distinct suffixes, reconstructing **(-o)-'m* with transitive verbs as the verbal "perfect status" inflection and **-e-'m* with intransitive verbs as a deverbal "participle/gerund" (Kaufman 2015: 242, 279, 307). I suspect that at minimum, **(-o)-'m* and **-e-'m* are diachronically related and may have been a single

suffix in pre-proto-Mayan, but further research may demonstrate a way to connect the two suffixes synchronically in proto-Mayan.

4.2.1.3. Voice

The biggest historical question in this chapter is whether **(-o)-'m* should be reconstructed as the proto-Mayan perfect only in active voice or also in passive contexts. The alternative is to reconstruct **-b'il* as the passive perfect participle. In sections 4.3 and 4.4 below, I give several points of evidence for reconstructing **(-o)-'m* as both the active and passive perfect participle. Here, I summarize the suffix's distribution in active and passive perfect contexts across the family. As seen in Table 12, Teenek and K'iche'an languages use the suffix in active and passive contexts, Yucatecan languages use it only in active voice, and Mamean languages use it only as a passive participle. Additional patient-oriented reflexes that are not specifically perfect participles (mentioned in section 4.2.1.1 above) include the Q'eqchi' *-om* patient noun, the Uspanteko and Poqomchi' *-maj* or *-mV$_R$j* passive suffix, the *-om* passive suffix of Soloma Q'anjob'al, and the *-Vm* adjectivizing suffix of Chontal.

Voice	Languages
Active only	*Yucatecan:* Yucatec, Lacandon, Itzaj
Active and passive	*Wastekan:* Teenek *K'iche'an:* K'iche', Kaqchikel, Tz'utujil, Sakapultek, Sipakapense, Poqomam, Poqomchi'
Passive only	*Mamean:* Mam, Tektiteko, Awakateko, Ixil

Table 12: Distribution of **(-o)-'m* perfect reflexes based on active or passive usage.

4.2.2. *-b'il*

A suffix of the form *-b'Vl* appears as a passive perfect participle in roughly half of all Mayan languages: all of the Yucatecan, Ch'olan-Tseltalan, and Q'anjob'alan languages, as well as Q'eqchi' (K'iche'an). Kaufman (2015: 307) reconstructs **-b'il* as the passive perfect participle in proto-Mayan. In section 4.4, I argue that **(-o)-'m*, not **-b'il*, should be reconstructed with this function. Here I discuss the distribution of **-b'il* reflexes as background for comparing it with **(-o)-'m.*

4.2.2.1. Distribution and reconstruction

In section 4.4, I will argue that all non-Western Mayan (that is, Teenek, Yucatecan and Q'eqchi') reflexes of **-b'Vl* are borrowed and that the suffix does not reconstruct to proto-Mayan as a participle. In this section, I focus on intermediate stages that can be more confidently reconstructed with a **-b'Vl* participle.

*-*b'il* reconstructs to proto-Yucatecan, as it is present in all Yucatecan languages. All modern Western Mayan languages (Ch'olan, Tseltalan, and Q'anjob'alan) also use a *-b'Vl* suffix as a passive perfect participle, so *-*b'Vl* should be reconstructed to proto-Western Mayan. It is worth noting that Q'anjob'alan and Ch'olan-Tseltalan languages have shared areal innovations since their separation as part of the Lowland Mayan linguistic area, such as the sound changes **r>y*, **nh>n*, and **q>k* (see Table 13 and surrounding discussion below), which could imply that the *-b'Vl* perfect also spread among Western Mayan languages by contact. However, Mocho' was unaffected by other Lowland areal innovations and still has a *-b'Vl* (specifically *-ob'aal*) perfect suffix, suggesting that it inherited the suffix from proto-Q'anjob'alan (and proto-Western Mayan).[26]

Q'eqchi' *-b'il* is an anomaly in Eastern Mayan, as nearly all other Mamean and K'iche'an languages use a reflex of **(-o)-'m* as the passive perfect participle; Q'eqchi' shows heavy influence from Ch'olan languages (Wichmann and Brown 2003, Wichmann and Hull 2009), so *-b'il* in Q'eqchi' is likely a Ch'olan borrowing. Kaufman (2015: 320) also suggests this origin without committing to it. I explore the areal borrowing of *-b'il* further in section 4.4.

[26] Note that even if Western Mayan languages inherited the *-b'Vl* perfect from their common ancestor, mutual contact may have influenced the form or usage of the suffix. I briefly discuss mutual contact in section 4.2.2.2 as one way to explain why Mocho' has the form *-ob'aal* while other Q'anjob'alan languages have *-b'il* like Ch'olan-Tseltalan languages.

4.2.2.2. Phonological reconstruction

In those languages that use *-b'Vl* as a perfect participle suffix, *-b'il* with an /i/ vowel is the most common form, found in all Ch'olan-Tseltalan and Yucatecan languages, most Q'anjob'alan languages, and Q'eqchi', which is why Kaufman reconstructs **-b'il* (2015: 313). (Exceptions do exist even in these languages: Bruce 1968: 75 reports the participial form *ch'a'-**b'äl*** 'taken, married' from the verb *ch'a'-* 'take' in the Yucatecan language Lacandon, though *-b'il* is the more common form.)

Mocho' and Tojol-ab'al have *-ob'aal* and *-ub'al* respectively. If these forms are indeed cognate with *-b'il*, the change in the middle vowel needs to be explained. Another discrepancy is the *o* or *u* vowel that begins the suffix in Mocho' (*-**o**b'aal*) and Tojol-ab'al (*-**u**b'al*), where the other cognates just begin in a consonant. This *o* or *u* could be a remnant of an earlier vowel that was part of the suffix, or it could result from the fusion of a stem vowel with the suffix. The vowels in Tojol-ab'al *-ub'al* are especially hard to account for: Tojol-ab'al is a mixed language with elements from Chuj and Tseltal (Law 2017a), and both source languages have the form *-b'il*.

One hypothesis is that the suffix originally varied between **-b'al* and **-b'il*, and that the vowel quality fossilized only recently in Q'anjob'alan languages, after they had diverged from one another. The fossilization of the *-b'il* form could have happened internally to Q'anjob'alan or been a result of contact with Ch'olan-Tseltalan languages, which all have *-b'il*. I have assumed this first hypothesis in reconstructing **-b'Vl* with an underspecified vowel in proto-Western Mayan and proto-Q'anjob'alan.

Another hypothesis is that the suffix was originally *-*b'il* in proto-Western Mayan and proto-Q'anjob'alan, but that the vowel quality changed in Mocho' and Tojol-ab'al. These first two hypotheses are incomplete without an explanation of what caused the variation in vowel quality; I do not have enough data to resolve this question here.

A third hypothesis is that Mocho' -*ob'aal* and Tojol-ab'al -*ub'al* have a distinct etymology from -*b'il* that appears in the other languages; for example, they could be cognate with the -*b'al* instrumental (see below).

A fourth hypothesis, a hybrid of the second and third options, is that the Mocho' and Tojol-ab'al suffixes are derived from an original *-*b'il* perfect participle, but their form was influenced by other phonologically similar suffixes such as a -*b'al* instrumental. In section 6.2.2.3, I suggest a similar story for Tojol-ab'al's active perfect marker -*uj*~-*unej*: that -*unej* may have originally been a reflex of intransitive perfect *-*i-naq* by way of Chuj -*nak*, but its form was influenced by the -*oj*/-*ej* active perfect marker from Tseltal.

I have not come across a principled way to decide between these four hypotheses. For this reason, I leave proto-Western Mayan *-*b'Vl* with an underspecified middle vowel for now, awaiting future more detailed research on Mocho' and Tojol-ab'al which may shed light on the question.

4.2.2.3. Base attachment and voice

In most cases, *-b'il* appears exclusively as the passive perfect participle of transitive verbs. Akateko uses *-b'il* with active transitive verbs, and Tumbalá Chol can use it with intransitive verbs, as I discuss below. In the Yucatecan and Tseltalan branches as well as Tojol-ab'al, *-b'il* contrasts with an active perfect marker (*-maj*, *-oj/-ej*, and *-uj/-unej* respectively), while Ch'olan and other Q'anjob'alan languages lack an active perfect construction altogether.

The Ch'olan subgroup has two major branches, Western Ch'olan (Chol and Chontal) and Eastern Ch'olan (Ch'olti' and Ch'orti'). Chontal and the Tila variety of Chol, varieties of Western Ch'olan, use *-b'il* mainly with derived transitive verbs (30a), and use a *-Vl* suffix for root transitives (30b). Vázquez Álvarez notes that "in Chol these suffixes do not make a clear distinction between participle and perfect readings" (2011: 213). A few transitive roots do not accept a participial suffix directly; instead, these must be passivized and take the intransitive perfect suffix *-em* (Vázquez Álvarez 2011: 215).

CHOL (TILA) (Vázquez Álvarez 2011: 213)

(30) a. *ts'äk-ä-**bil**-Ø*
cure-DTV-PTCP-B3
'It is cured.'

b. *ma'añ* *mos-**ol**-ety* *tyi* *sabana*
NEG.EXST cover-PTCP-B2 PREP blanket
'You are not covered by the blanket.'

Western Ch'olan's use of -*Vl* as a perfect participle is an innovation. All other Ch'olan-Tseltalan languages use -*b'il* with both root and derived transitive verbs, which I therefore assume to have been the original situation in proto-Ch'olan-Tseltalan. Proto-Ch'olan-Tseltalan did, however, extend the *-V_R*l* stative participle suffix from positionals to transitive roots: Tseltal and Tsotsil maintain a distinction between -*b'il*, the perfect participle, and -V_R*l*, a (non-eventive) stative participle, with RTVs. Chontal and Tila Chol have lost the semantic distinction between the two suffixes; instead, -V_R*l* became the only participial suffix for RTVs, while -*bil* was reinterpreted as the DTV participial suffix. I discuss -V_R*l* more fully in section 4.2.4.

Vázquez Álvarez notes that the Tumbalá variety of Chol uses -*bil* as the only perfect marker, even with intransitive verbs, though he does not provide any Tumbalá examples (2011: 215). Proto-Ch'olan had *-*em*~-*en* with intransitive verbs (section 3.1.2), so Tumbalá Chol is innovative in using -*b'il* here. Tumbalá Chol uses -*bil* with RTVs as well, like proto-Ch'olan, but unlike the other Western Ch'olan varieties, Chontal and Tila Chol. There are two ways to explain this: Tumbalá may have inherited Western Ch'olan -*Vl* but then re-extended -*bil* to RTVs and IVs by analogy with DTVs. Alternatively, the loss of -*b'il* with transitive roots and its replacement with -*Vl* may have been a wave innovation that occurred in Chontal and Tila Chol to the exclusion of Tumbalá Chol. I favor the wave innovation because it requires fewer changes: Tumbalá Chol RTVs retain -*b'il* from proto-Ch'olan, instead of having lost and then regained it.

Akateko uniquely uses -*b'il* not only in passive constructions like (31), but also with active transitive verbs as in (32). This should be seen as an innovative extension of

the passive perfect participle to active contexts, a common process within Mayan languages that I discuss at length in sections 4.4.3 and 6.4.2.

AKATEKO (Zavala 1992: 59)

(31) *xa* *x-Ø-kam=el* *no'* *mam-**b'il*** *txee* *tu'*
already COM–B3–die=DIR.out CLS:animal buy–PERF horse this
'The bought horse already died' (Zavala 1992: 109)

(32) *in-a-ma'-**b'il**=an*
B1S–A2S–hit–PERF=CL1S
'you have hit me'

4.2.2.4. Similar but non-cognate suffixes

Other *-b'Vl* suffixes appear in Mayan languages that are not perfect participles and seem to be etymologically distinct. Most notable among these is a suffix *-b'al* or *-b'il* that creates instrument or locative nominalizations (for a partial cognate list, see Kaufman 2015: 314). Instrumental/locative *-b'al* is found in K'iche'an and Q'anjob'alan languages (33-35), while *-b'il* appears in Mamean languages and Uspanteko (36-37). A shorter form *-Vb'* is also found across the family.

K'ICHE' (López Ixcoy and Sis Iboy 2007: 32-33)

(33) a. *q'at-**ob'al*** 'instrument for cutting' < RTV *q'at-* 'cut'
b. *k'ay-i-**b'al*** 'place for selling' < DTV *k'ay-i-j* 'sell'
c. *war-**ab'al*** 'place for sleeping' < IV *war-* 'sleep'

POQOMCHI' (Mó Isém 2007b: 24)

(34)	a.	*itin-**b'al***	'bathroom, shower'	< IV *itin-* 'bathe'
	b.	*il-**b'al***	'instrument/place for seeing'	< RTV *il-* 'see'
	c.	*chiq-s-**b'al***	'instrument/place for drying'	< DTV *chiq-s-* 'dry'

Q'ANJOB'AL (Francisco Pascual 2007: 23)

(35)	a.	*txon-**b'al***	'place for selling'	< RTV *txon-* 'sell'
	b.	*tz'ib'e-**b'al***	'writing instrument'	< DTV *tz'ib'e-* 'write'
	c.	*kam-**b'al***	'dangerous place'	< IV *kam-* 'die'

MAM (Pérez Vail and Pérez Alonzo 2007: 26)

(36)	a.	*tx'aj-**b'il***	'*pila*, sink, place for washing'	< RTV *tx'aj-* 'wash'
	b.	*e'w-**b'il***	'hiding place'	< RTV *ew-* 'hide'
	c.	*wa'-**b'l***	'place for eating'	< IV *wa'-* 'eat'

USPANTEKO (Can Pixabaj 2007: 89-90)

(37)	a.	*mes-**eb'*** ~ *més-**b'il***	'broom'	< RTV *mes-* 'clean'
	b.	*tíj-**b'il***	'place for eating'	< RTV *tij-* 'eat'

Even though both the *-b'Vl* instrumental/locative nominalization and *-b'Vl* perfect participle are widespread across the family, they are generally not homophonous in the same language, highlighting the fact that they seem to come from different sources. Q'eqchi', for example, has *-b'il* as the perfect participle but *-leb'* and *-b'aal* as instrument and location nominalizations (38). Q'anjob'al likewise contrasts the *-b'al* instrumental (seen in 35) with the *-b'il* perfect participle.

Q'EQCHI' (Tzoc 2003: 34)

(38)	a.	*yok'-**leb'***	'instrument for cutting'	< RTV *yok-* 'cut'
	b.	*k'ay-ii-**b'aal***	'market'	< DTV *k'ay-ii-* 'sell'

In Mocho', the two suffixes have the same vowel quality but differ in length. Kaufman cites the suffix *-ob'aal~-ub'aal* as both the "adjective/passive participle" and

"noun/resultant patient" (i.e. patient nominalization), but *-b'al* as "noun/instrument" (instrument nominalization) (Kaufman 1967: ix) (39a-b). In some examples, however, this distinction is paper-thin: Palosaari (2011: 49) translates the *-b'al* nominal in (39c) (which lacks the preceding *oo* vowel) with a resultant patient meaning, following the middle voice suffix *-oon/-uun* (*-uum* after nasal place assimilation).

MOCHO' (Kaufman 1967: 74; Palosaari 2011: 49, 131)

(39) a. *k'am-**b'al***
call-INST
'horn for calling'

b. *noq'-**oob'al***
grind-RES.PAT
'powder'

c. *k'uux-uum-**b'al***
hurt-MID-RES.PAT
'the resultant pain'

Smailus, speaking only of Chontal, suggests that *-bil* is a combination of the instrument nominalization *-ib* plus the abstract noun suffix *-il* (Smailus 1975: 200-202, cited in Knowles 1984: 249). Kaufman, taking a wider view of the family, suggests two separate etymologies for the perfect participle and instrument nominalization. He treats *-b'al* or *-b'il* instrument nominalizations as descendants of a proto-Mayan instrument nominalization **(-a)-b'* (with transitive verbs), **-i-b'* (with intransitive verbs) (2015: 314). Perfect participle **-b'il* in his view reconstructs to proto-Mayan, but may have been synchronically derived from the proto-Mayan **(-a)-b'* 'unbounded passive' suffix plus a **-Vl* nominalizing suffix (2015: 320). In my opinion, Kaufman's morpheme breakdown

better accounts for the difference in meaning and usage between the passive perfect participle and the instrument nominalization: passive perfect *-b'il* focuses on the patient of the action, not an instrument, which is to be expected if it is based on a passive suffix. Kaufman's analysis also explains why the *-b'il* perfect and *-b'al* instrument nominalization remain distinct in languages such as Q'anjob'al: they are etymologically unrelated. Further work is necessary to clarify the history of instrument nominalizations in Mayan languages, as they are beyond the scope of the present work.

Another suffix *-b'al* (Bruce 1968: 72, 75), *-b'ahr* (Bergqvist 2008: 85), or *-b'aar* (Hofling 2014: 20)[27] creates passive participles and instrument nominalizations from positional roots in Lacandon (40a-b). When used to create a participle, it is always preceded by *-uk* as in (40a). With transitive verbs, *-b'ahr* does not appear as a participle, but it does appear as an instrument nominalization (41). Bergqvist notes that *-b'ahr* is limited to Southern Lacandon; Northern Lacandon uses *-b'äk'* (2008: 85). I am unsure of its relationship to *-b'il* or *-b'ir*, which is the productive passive perfect participle in Lacandon (Bruce 1968: 75; Bergqvist 2008: 110; Hofling 2014: 20).

LACANDON (SOUTHERN) (Bergqvist 2008: 87, 110)

(40) a. *jup-uk-**b'ahr***
insert-?-PTCP
'It is inserted'

b. *u-t'uch-u-**b'ahr***
A3S-squat-?-PTCP
'The base of something where you put things', 'its seat'

[27] Proto-Yucatecan **l>r* in Lacandon, unconditionally in Southern Lacandon and after a vowel in Northern Lacandon (Hofling 2017: 691).

(41) *b'in in-ka' 'in-xat'-ej-Ø ju'n yejer u-xaat'-a-**b'ahr***
FUT A1S-do A1S-cut-DEP-B3S paper with A3S-cut.AP-?-NOM
'I am going to cut the paper with a pair of scissors.'

4.2.3. *-ooj/-uuj*

The history of the **-ooj/-uuj* suffix will be treated at length in chapter 6. In summary, I reconstruct **-ooj/-uuj* to proto-Central Mayan as an action nominalization of transitive roots. (Kaufman 2015: 319 has **-o-ej* with RTVs and **-ej* with DTVs; the former resolves to **-ooj* through hiatus resolution.) **-ooj/-uuj* was reanalyzed in Poqom and Tseltalan as a passive perfect participle and as an active perfect marker respectively.

4.2.4. *-Vl*

A participial suffix *-Vl* appears with RTVs and some intransitive verbs in Ch'olan-Tseltalan languages (Chol, Chontal, Tsotsil, and Tseltal, in addition to Tojol-ab'al). Ixil uses *-l(a')* as the perfect participle of RTVs and DTVs, and also has a "stative resultative" participle that takes the form *-el* with RTVs and *-m-al* with DTVs. Uspanteko uses *-(V_R)l* with both transitive and intransitive verbs. Yucatecan languages use *-al* or *-V_Rl* to form a stative participle of transitive or intransitive verbs. Nearly all of these languages also use a phonologically similar *-V_Rl* suffix to form a "stative participle" of positional roots. A full exploration of positional morphology is beyond the scope of this dissertation, but in this section I argue that the positional stative is the most likely source

of the *-Vl* perfect used with verbs, an innovation that happened first in Ch'olan-Tseltalan and spread to the other languages by pattern replication. (The exception to this is Tojol-ab'al, where the positional stative participle is *-an,* and the *-el* perfect participle instead derives from the intransitive infinitive suffix.) Because the distribution is different in each language that has it, I discuss each language separately below.

4.2.4.1. Ch'olan-Tseltalan

Vázquez Álvarez (2011: 213-215) glosses *-V_Rl* in Chol as a "stative" suffix, appearing with positional roots (42a), two intransitive verbs (42b), and most RTVs[28] (42c). It is in complementary distribution with *-em,* which occurs on all other intransitive verbs, and *-bil,* which appears with derived transitive verbs. (As noted above in section 4.2.2.3, Tumbalá Chol does not share this distribution and uses *-b'il* as the only perfect suffix.) The "stative" label is not a rigid semantic description, but simply indicates that this suffix creates non-verbal predicates: this form can only occur with Set B agreement, not Set A, and does not occur with aspectual auxiliaries like a verbal predicate. However, it can occur with aspectual clitics *=ix* and *=tyo* that occur with other non-verbal predicates (42b). Semantically, "these suffixes do not make a clear distinction between participle and perfect readings" (Vázquez Álvarez 2011: 213).

[28] Six transitive roots in Tila Chol cannot take *-V_Rl,* but must instead be passivized and take the intransitive perfect suffix *-em* (Vázquez Álvarez 2011: 215). Syntactically, the effect is the same, as the *-V_Rl* perfect forms are also passive.

CHOL (TILA) (Vázquez Álvarez 2011: 214)

(42) a. *ch'uj-buch-**ul**-ety* *tyi* *ji'*
all.the.time-sitting-STAT-B2 PREP sand
'You are seated in the sand (immobile).'

b. *ch'uj* *p'ix-**il**-oñ=ix=loñ*
all.the.time awake-STAT-B1=already=P.EXCL
'We were already awake.'

c. *ma'añ* *mos-**ol**-ety* *tyi* *sabana*
NEG.EXST cover-STAT-B2 PREP blanket
'You are not covered by the blanket.'

The form and distribution of the -V_R*l* participial suffix is slightly different in Chontal than in Chol, though clearly related. The final consonant is often elided when the participle is word-final. It occurs with positionals (43a), RTVs (43b), and DTVs of the form *CVC-V(n)* (43c), as well as some intransitive roots (43d). Osorio May (2005: 284) additionally mentions verbs such as *p'is-* 'weigh' that can be transitive or intransitive and can also take -V_R*l* (43e). -V_R*l* is normally used as an adjective in predicate function; a different form, -V_R*',* is used as an attributive adjective within a noun phrase (Knowles 1984: 247).

CHONTAL (Knowles 1984: 245-246; Osorio May 2005: 284)

(43) a. *'u* *chitam* *chum-**u**-Ø*
A3 pig seated-PTCP-B3
'His pig, it is seated'

b. *pok-**o(l)***
scrub-PTCP
'scrubbed'

c. *sum-**u(l)***
braid-PTCP
'braided'

d. *chäm-**ä(l)***
die-PTCP
'dead, lukewarm'

e. *p'is-**il**-et*
weigh-PTCP-B2
'you are heavy'

A semiproductive suffix *-el,* which may or may not be related to *-V_Rl,* appears with a few RTVs and DTVs of the form *CVC-V(n)* and is used only to create attributive adjectives. For the roots that take *-el,* this suffix is seemingly in free variation with *-V_R'.*

CHONTAL (Knowles 1984: 249)

(44) a. *'u* *mux-**el*** *p'et*
A3 smash-PTCP pot
'his smashed pot'

b. *'u* *mux-**u'*** *p'et*
A3 smash-PTCP pot
'his smashed pot'

Tsotsil, unlike Chol and Chontal, maintains a functional difference between *-em*, *-bil*, and *-V_Rl* with transitive roots. All three indicate a state, but while *-V_Rl* indicates a pure state without highlighting any prior action, the use of *-em* or *-bil* entails a prior action that led to the result state. *-em* and *-bil* in turn differ in the expression of an agent: *-bil* is passive, entailing that an agent performed the action, while *-em* is mediopassive, implying that the event happened without the involvement of an agent. (45) shows all three meanings.

TSOTSIL (Haviland 1981: 258)

(45) a. *Mak-**em*** *li* *na* *e*.
close-PERF DET house PH.FIN
'The house is closed' (and closed by itself or as a result of an impersonal process)

b. *Mak-**bil*** *li* *na* *e*.
close-PERF DET house PH.FIN
'The house is closed' (and a nonspecific agent did it)

c. *Mak-**al*** *li* *na* *e*.
close-PERF DET house PH.FIN
'The house is closed' (in the condition of being closed)

Tsotsil uses the same -V_R*l* suffix to create stative participles from positional roots (Haviland 1981: 240 calls them "adjectives"). Haviland notes that participles derived in -V_R*l* from positionals or transitive verbs can only be used as predicates, not attributively (1981: 180).

Oxchuc Tseltal preserves at least two stative participles derived in -V_R*l* that Polian (2013: 583) identifies as being from transitive roots (46). Polian expressly connects this to the -V_R*l* positional stative suffix (47). As in Tsotsil, stative -V_R*l* contrasts with the perfect participle -*bil* (compare 46a to 48) though because -V_R*l* is so unproductive, Polian does not elaborate on the functional difference between the two.

TSELTAL (OXCHUC) (Polian 2013: 172, 574, 583)

(46) a. *na'-al* 'aware, remembering sth.' < RTV *na'*- 'know, remember'
b. *paj-al* 'equal, similar' < RTV *paj*- 'compare'

(47) a. *nak-al* ‘seated’ < POS *nak-* ‘seated’
b. *tek-el* ‘standing up’ < POS *tek-* ‘standing’
c. *kot-ol* ‘on four feet (animal, car)’ < POS *kot-* ‘on four feet’

(48) ***na’-bil*** *s-tojol* *te* *cheb* *ja’wil* *x-k’ot-ok* *ta* *España*
know-PERF A3-until DET two year INC-arrive-IRR PREP Spain
‘It is known that that s/he went to Spain for two years.’

As I argued above in section 4.2.2, **-b’il* can be reconstructed to proto-Ch’olan-Tseltalan as the passive perfect participle of both RTVs and DTVs. I propose that Tseltal and Tsotsil preserve the original proto-Ch’olan-Tseltalan distribution: a **-b’il* ‘perfect participle’ and *-V_R*l* “stative participle” could both occur with RTVs, where the first entails a prior event and the second does not. Tila Chol and Chontal innovated in allowing *-V_R*l* to take over the functions of **-b’il*. Proto-Ch’olan-Tseltalan *-V_R*l* originally came from a positional stative suffix, as evidenced by the fact that the two are still homophonous in Ch’olan-Tseltalan languages and share the stative meaning.

4.2.4.2. Ixil

According to Adell (2019: 269), the Ixil *-l(a’)* perfect suffix may occur with verbal predicates in active voice, in which case it normally co-occurs with the ‘cessive aspect’ proclitic *qat=* (49a-b). The full form *-la’* is used phrase-finally. The *-l(a’)* perfect may also occur as a non-verbal predicate with a passive reading as in (49c), though Adell does not give any full-sentence examples of this usage.

IXIL (CHAJUL) (Adell 2019: 269, 103)

(49) a. *qat=etz* *i-b'an-**l*** *in-b'aal* *tchi'-tcho-il*
CESS=DEM A3-do-PERF A1S-father envy-ATTEN-ABST
'Regarding that, my father has done an envious thing.'

b. *qat=qu-b'an-**la'***
CESS-A1P-do-PERF
'We have done it'

c. *b'an-**l***
do-PERF
'done just now'

The "stative resultative" participles *-el* and *-mal* occur with RTVs and DTVs respectively (Ayres 1991: 125; Adell 2019: 444). These form non-verbal predicates; they do not occur with TAM proclitics. Because of the differences in phonology and usage between these and the *-l(a')* perfect, I am unsure whether they can be connected synchronically, despite sharing the general form *-(V)l*.

IXIL (CHAJUL) (Adell 2019: 445, 447)

(50) *kol-**el**=vet* *u=jal* *t-uul=aq* *k'oay*
store-STAT=PRCN DET=corn.ear A3-inside=P granary
'Then ears of corn are stored inside granaries.'

(51) *iq'o-**mal*** *inq'a=i-liivro* *naq*
bring-STAT DET.PL=A3-book 3.MASC
'His books were already brought' (i.e. they were already there).

Ayres notes that when the stative participle appears before a noun modifying it attributively, the distinct suffix *-ich*[29] appears instead of *-el* with RTVs. I am uncertain of

[29] Ayres lists *-itch* (Chajul) or *-ich* (Nebaj). Ayres uses the trigraph *tch* to represent /tʃ/ in Chajul, which is represented by *ch* in standard practice and in the orthography of Adell (2019: 23-24). Ayres uses *ch* to represent Chajul /tsʃ/, for which Adell uses *tch*. Nebaj does not distinguish the two phonemes and has only

the source of the *-ich* form. With DTVs, *-mal* reduces to *-m* (Chajul) or *-'m* (Nebaj) before a noun.

IXIL (Ayres 1991: 126)

(52) a. *u* *jaq-**ich*** *ixoq* (Chajul)
DET lose-STAT woman
'the lost woman'

b. *u* *tx'a-**ich*** *oksa'm* (Nebaj)
DET wash-STAT clothing
'the washed clothing'

c. *u* *votz'i-**m*** *chib'* (Chajul)
DET grill-STAT meat
'the grilled meat'

d. *u* *b'oxi-**'m*** *chib'* (Nebaj)
DET grill-STAT meat
'the grilled meat'

As discussed in section 4.2.1.1 above, *-mal* is most likely a fusion of the **(-o)-'m* perfect with a *-Vl* stative suffix, though why **(-o)-'m* was only preserved with DTVs is unclear (cf. closely related Awakateko where *-Vn-t*, derived from **(-o)-'m*, also occurs only with DTVs; section 4.2.5.2 below).

In Ixil, the same *-el* suffix also occurs with positional roots. Positional roots are derived as predicates in Ixil using a suffix *-l~-tch* (the latter allomorph is used to dissimilate from a root containing /l/ or /r/) (Adell 2019: 167-168). The *-el* "non-verbal predicate" suffix in turn attaches to this "Positional Predicate" suffix (Adell 2019: 425).

ch /tʃ/ (Ayres 1991: 2). Thus, both the Chajul and Nebaj suffixes are phonemically /-itʃ/, written as *-ich* in standard orthography.

IXIL (CHAJUL) (Adell 2019: 425)

(53) *jaq-l-**el**=vet* *i-jaq'* *u=vitz*
open-PRED.POS-STAT=PRCN A3-underside DET=mountain
'Now the underside of the mountain is opened up.'

There are exceptions to the above pattern: Ayres (1991: 46) has examples where *-el* attaches directly to a positional root, such as *chas-el* 'wrapped, doubled over, wearing two layers of clothes'.

The homophony between the positional stative and the deverbal "stative resultative" suggests that the two are historically connected, likely an extension from positional roots to transitive verbs as in Ch'olan-Tseltalan languages. In turn, the fact that Ixil and Ch'olan-Tseltalan share this parallel innovation suggests contact. Ixil has borrowed other features from Ch'olan languages: vocabulary (Wichmann and Brown 2003: 59ff) and a split-ergative pattern in incompletive aspect (Law 2014: 54).

Note that this was probably not a direct borrowing, as the form of the suffix differs from Ch'olan-Tseltalan: Ixil has invariant *-el* (with both positionals and RTVs) where Ch'olan-Tseltalan languages have vowel-harmonic *-V_Rl*. The distribution of the positional suffix also differs: the *-el* positional stative participle in Ixil normally attaches to a distinct "positional predicate" suffix *-l~-tch* as in (53) above, while it attaches directly to the root in Ch'olan-Tseltalan. What these discrepancies suggest is that both Ch'olan-Tseltalan and Ixil inherited a proto-Mayan positional stative suffix with the general form *-*Vl*. Ixil borrowed not the form of the Ch'olan-Tseltalan suffix, but the

pattern of extending the positional stative to transitive roots, an example of pattern replication without matter replication (Matras and Sakel 2007).

4.2.4.3. Uspanteko

Uspanteko uses *-(V$_R$)l* as the perfect participle of transitive and intransitive verbs. (54) shows intransitive roots and (55) shows transitive verbs. The form of the suffix is generally *-V$_R$l* with IVs (54a) or RTVs (55a) and *-l* with DTVs (55b), though there are exceptions (54b, 55c). Unlike in Ch'olan-Tseltalan and Ixil, these participles occur with the *-ik* intransitive category suffix.

USPANTEKO (Can Pixabaj 2007: 111)

(54)	a.	*war-**ál**-ik*	'having slept'	(IV *war-* 'sleep')
	b.	*jol-**íl**-ik*	'having run'	(IV *jol-* 'run')
(55)	a.	*yuq-**úl**-ik*	'stretched'	(RTV *yuq-* 'stretch sth')
	b.	*tz'ib'-á-**l**-ik*	'written'	(DTV *tz'ib'-a-* 'write sth')
	c.	*b'in-s-**él**-ik*	'walked [by sb.]'	(DTV *b'in-s-* 'make someone walk')

Two similar suffixes occur with positional roots in Uspanteko. A *-(V$_R$)l* suffix creates stative predicates from positional roots (56). Positional roots also have a "perfect" or "perfect participle" suffix *-al* (*-ol* with root vowel /o/) (57). Both "positional predicates" and the "positional perfect participles" occur with the *-ik* intransitive category suffix. Neither suffix is entirely homophonous with the deverbal perfect participle, however. The "positional predicate" suffix dissimilates to become *-(V$_R$)n* when the positional root ends in /l/, (56d; compare the RTV participle in 54b above which does not show dissimilation).

The positional "perfect participle" *-al~ol* shows a different pattern of vowel harmony than its verbal equivalent *-V_Rl*.

USPANTEKO (Can Pixabaj 2007: 112, 220)

(56) a. *ch'uk-**úl**-ik* 'squatting, sitting on one's heels'
b. *lek-**él**-ik* 'lifted up'
c. *wa'-**l**-ik* 'standing'
d. *tzal-**án**-ik* 'to one side'

(57) a. *kub'-**ál**-ik* 'has been seated'
b. *tox-**ól**-ik* 'is blocked, has been blocked'
c. *pak'-**ál**-ik* 'has one's mouth open, has had one's mouth open'

Because the patterns of allomorphy do not entirely match, the connection between the positional and verbal perfect participle is not as clear as in Ch'olan-Tseltalan. However, the similarities in form (the general form *-Vl*), meaning (perfect aspect), and distribution (occurrence with *-ik* category suffix) are close enough that I consider them related, and a future investigation may find a satisfying way to explain the discrepancies in vowel allomorphy.

Uspanteko, like Ixil, has evidence of contact with Ch'olan. For example, Uspanteko shares the Ch'olan pattern of expressing 2nd person plural using the 2nd person singular prefix along with a plural enclitic (Campbell 1977: 71). I suggest a similar explanation as in Ixil: contact with Ch'olan was responsible for Uspanteko's extension of a positional suffix to verbs, but the particular form and distribution of the suffix (particularly the presence of the *-ik* intransitive category suffix) reflects that it derives

from Uspanteko's inherited reflex of the *-*Vl* positional stative, not a direct borrowing of the Ch'olan suffix.

4.2.4.4. Yucatecan

Itzaj uses *-al* to create participles from intransitive roots and "mediopassive stems" (58) (Hofling with Tesucún 2000: 172). Yucatec similarly uses a vowel-harmonic -V_R*l* suffix to create participles of intransitive verbs (59) while Mopan has -V_R*l* participles of transitive verbs (60). These are distinct from the "passive perfect participle" which is formed using *-b'il* (Southern Lacandon *-b'ir*) in all Yucatecan languages (Hofling 2017: 705), but more work needs to be done to determine the exact difference in usage between these.

ITZAJ (Hofling with Tesucún 2000: 172).

(58) a. *em-al*
descend-PTCP
'lowered'

b. *xu<'>p-al*
use.up<MP>-PTCP
'used up'

YUCATEC (MODERN, HOCABÁ) (Bricker 2019: 274)

(59)	a.	*kìim-il*	'dead'	< IV *kíim* 'to die'
	b.	*lùub'-ul*	'fallen'	< IV *lúub'* 'to fall'

MOPAN (Hofling 2011, cited in Bricker 2019: 38)

(60)	a.	*kach-al*	'broken'	< *kach-* 'break' (unproductive root)
	b.	*tzil-il*	'born'	< RTV *tzil-* 'tear'
	c.	*muk-ul*	'hidden, in hiding'	< RTV *muk-* 'hide'

As noted in 4.2.4.1, Tsotsil distinguishes a -V_R*l* non-eventive "stative participle" from the -*b'il* passive perfect participle, a situation that I reconstruct to proto-Ch'olan-Tseltalan. Given the extensive evidence of contact between Ch'olan-Tseltalan and Yucatecan languages (Justeson et al. 1985, Law 2014; discussed in section 4.4 below), it is most natural to consider Yucatecan -V_R*l* an areal innovation shared with Ch'olan-Tseltalan, though it is also possible that proto-Mayan used *-V_R*l* as a non-eventive "stative participle" of RTVs and that both Ch'olan-Tseltalan and Yucatecan retain this usage. This requires further research.

4.2.4.5. Tojol-ab'al

As mentioned in section 2.1.1, Tojol-ab'al is a mixed language with elements of both Chuj and Tseltal (Law 2017a, Gómez Cruz 2017). Tojol-ab'al uses an -*el* perfect participle with intransitive verbs only (61). Gómez Cruz calls -*el* an innovation, as Tseltal has -*em* and Chuj has -*nak* for the same function (2017: 127). A semantically distinct but homophonous suffix -*el* is used to create non-finite forms of intransitive verbs in Tojol-ab'al (62).

TOJOL-AB'AL (Gómez Cruz 2017: 127, 397)

(61) *k'i-**el**-Ø=xa* *ja=ixim=i*
grow-PERF-B3=already DET=corn=DET
'The corn is already grown.'

(62) *way-i-y-on* *nox-**el***
go-IV.SUF-EP-B1 bathe-NF
'I went to take a bath.'

Unlike the languages discussed above, the *-el* intransitive perfect participle in Tojol-ab'al is not homophonous with a positional stative suffix. The positional stative suffix is *-an*, inherited from Chuj (Gómez Cruz 2017: 281-282). Thus, its origin cannot be a result of an extension from the positional stative as I have argued above for Ch'olan-Tseltalan, Ixil, and Uspanteko.

There are two ways to resolve this. One is to say that Tojol-ab'al underwent direct affix borrowing from Chol, where *-V_Rl* can be used as a perfect suffix with some intransitive roots as well as transitive roots (noted in section 4.2.4.1 above). This possibility does not account for the difference in phonology, where Chol has vowel-harmonic *-V_Rl* while Tojol-ab'al has invariant *-el*. In addition, Law notes that while Chol and Tojol-ab'al have a lot of lexical overlap, this could be due to contact between Chol and Tseltal (one of Tojol-ab'al's source languages), rather than direct contact between Chol and Tojol-ab'al (Law 2017a: 69), which further reduces the plausibility of direct affix borrowing.

A more likely scenario is that Tojol-ab'al recruited the *-el* intransitive infinitive suffix as a perfect participle, accounting for the homophony between the two suffixes (61-62). A similar extension took place in proto-Ch'olan-Tseltalan, which reanalyzed the proto-Central-Mayan **-e-'m* intransitive action nominalization suffix as a perfect participle (section 3.1.2). This analysis best explains the form of the suffix.

4.2.4.6. Summary of -Vl

The use of *-Vl* as a perfect suffix does not reconstruct to proto-Mayan, as reflexes of both *-*b'il* and **(-o)-'m* are much more common across multiple branches of the family. The most likely source is a proto-Mayan suffix *-V_R*l* that was used to create stative adjectives from positional roots. Proto-Ch'olan-Tseltalan extended the suffix as a non-eventive "stative participle" of transitive roots, contrasting with the *-*b'il* perfect participle; in Tila Chol and Chontal, -V_R*l* later replaced *-*b'il* altogether as the perfect participle of transitive roots. All other languages with a *-Vl* perfect suffix are known to have been in contact with Ch'olan-Tseltalan, so that the most likely explanation is that Ch'olan-Tseltalan languages were the first to extend the suffix from positionals to verbs, and that other languages replicated this pattern. (Tojol-ab'al is an exception, where the intransitive perfect participle *-el* appears to be an extension of the *-el* intransitive infinitive suffix.) Nevertheless, the diachrony of positional morphology needs to be explored more fully, and understanding the history of positional statives would shed more light on their connection to the corresponding verbal suffixes.

4.2.5. Less common morphemes

I here discuss a few perfect morphemes that occur with transitive verbs and are not as widespread across the family. These represent innovations within a single language or small set of closely related languages. Recurring sources of transitive perfect morphemes include time adverbs and the extension of intransitive perfect suffixes to transitive verbs.

4.2.5.1. Transitive perfect reflexes of ***-i-naq**

Awakateko *-naq* and Chuj *-nak* (from proto-Mayan *-*i*-*naq*) were extended from intransitive verbs to mark perfect aspect on active transitive verbs. I discuss *-*i*-*naq* in section 3.1.1. I also concur with Kaufman (1984), Dakin (1988), and Law (2017a) that active perfect *-unej* in Tojol-ab'al is related to *-*i*-*naq* by way of Chuj *-nak*, though I suggest its form may have been influenced by the *-oj* perfect of Tseltal (for more on this, see section 6.2.2.3).

In addition to the active perfect uses, Domingo Pascual's (2007) normative grammar of Chuj show *-nak* acting as a passive participle of some transitive verbs, alongside *-b'il* (63a-b) (see section 3.1.1.2). Other stems use only *-b'il* (63c-d). There is not enough data to determine what governs the alternation, though I note that it resembles the use of intransitive perfect participle *-*e'm* in mediopassive contexts in Ch'olan-Tseltalan languages (section 3.1.2.3). Future research could determine to what extent the *-nak* or *-b'il* participle entails the existence of an agent (a passive participle) or if the action is seen as occurring by itself (mediopassive). (As noted in section 3.1.1.2, Awakateko and Tektiteko can similarly use *-naq* in (medio)passive contexts.)

CHUJ (Domingo Pascual 2007: 180)

(63) a. *tz'ob'-**nak*** or *tz'ob'-**b'il***
kiss-PERF
'kissed'

b. *tzol-**nak*** or *tzol-**b'il***
order-PERF
'ordered, set in order'

c. *chonh-**b'il***
sale-PERF
'sold'

d. *b'ik-**b'il***
wash-PERF
'washed'

4.2.5.2. -ij(t) *and* -Vnt *in Awakateko*

Awakateko has two passive perfect participles, *-ijt* with RTVs and *-Vnt* with DTVs (Tuyuc Sucuc 2001: 89). McArthur and McArthur (1966: 228) list the former suffix as just *-ij*. Note that in (65), I have analyzed the vowel preceding the suffix as part of the DTV stem, whereas Tuyuc Sucuc (2001) analyzed it as part of the suffix.

AWAKATEKO (Tuyuc Sucuc 2001: 90)

(64)	a.	*loq'-**ijt***	'bought'	< RTV *loq'-* 'buy'
	b.	*choj-**ijt***	'paid'	< RTV *choj-* 'pay'
(65)	a.	*k'ay-i-**nt***	'sold'	< DTV *k'ay-i-* 'sell'
	b.	*eeq'-a-**nt***	'carried'	< DTV *eeq'-a-* 'carry'

As in other Mamean languages, Awakateko *t* comes from proto-Mayan **r* (Campbell 2017: 49). The final *-t* in both *-ijt* and *-nt* may be cognate with the Classic Mayan *-iiy* suffix that Robertson et al. (2004: 269) see as a past tense inflection, ultimately from proto-Mayan **-eer*. Wald (2004: 256) sees *-ij-iiy* in the glyphs as an adverbial enclitic that marks a prior event in the discourse. Classic Mayan *-ij-iiy*, from earlier **-ej-eer*, is a plausible cognate of Awakateko *-ij-t*. Note that in section 3.1.6, I suggested that the *-y(aj)*

intransitive perfect suffix in Ixil is also related to Ch'olan *-iiy*, but the Ixil suffix must have been borrowed, as it shows the Ch'olan **r>y* change, while the inherited Awakatek reflex underwent the Mamean **r>t* change.

The source of *-n* in Awakatek *-Vnt* may simply be a reflex of the **-'m* perfect participle of DTVs. Ixil similarly preserves an **-'m* reflex with DTVs in the form of the *-mal* stative resultative suffix, which shortens to *-(')m* in prenominal contexts (Ayres 1991: 125-126). Kaufman also suggests this connection (2015: 288).

4.2.5.3. **-oyoon/-uyuun** *in Tz'utujil*

Tz'utujil has an "agent focus perfect participle" *-oyoon/-uyuun/-yoon*. Tz'utujil, like many Mayan languages, has an "Agent Focus voice" that is used when the agent of a transitive verb is put in contrastive focus, usually marked with the suffix *-ow/-uw* on RTVs or *-(V)n* on DTVs (Dayley 1985: 347). The Agent Focus construction is syntactically transitive in that both the agent and object may be present in the sentence as non-oblique arguments and are available for agreement, but the verb becomes morphologically intransitive and agrees with only one argument—either the agent or the object, depending on a person hierarchy (non-3rd person>3rd person plural>3rd person singular). Example (66) shows this construction: the speaker is the agent in (66a) and the object in (66b), but in both cases the verb is marked for 1st person singular agreement.

TZ'UTUJIL (Dayley 1985: 349)
(66) a. ***Inin*** *x-**in**-ch'ey-ow-i.*

1S.PRO COM-B1S-hit-AF-IV.SUF
'I was the one who hit him.'

b. ***Jaa'*** *x-**in**-ch'ey-ow-i.*
3S.PRO COM-B1S-hit-AF-IV.SUF
'He is the one who has hit me.'

The "agent focus perfect participle" in *-oyoon/-uyuun/-yoon* follows the same distribution: it can agree with the agent or object based on a person hierarchy, as shown in (67). The suffix is *-oyoon* by default with RTVs, varying to *-uyuun* to harmonize with a root vowel /u/, and *-yoon* attaching to a DTV stem vowel (Dayley 1985: 214).

TZ'UTUJIL (Dayley 1985: 214, 353)

(67) a. *Inin* ***in*** *ch'ey-oyoon*
1S.PRO B1S hit-AF.PERF
'I am the one who has hit him.'

b. *Jar aachi* ***in*** *ch'ey-oyoon*
DET man B1S hit-AF.PERF
'The man is the one who has hit me.'

This suffix may be combining Tz'utujil's existing *-oon/-uun/-n* perfect, a reflex of proto-Mayan **(-o)-'m,* with a *-Vy* suffix that has an agentive function. Closely related Kaqchikel uses an *-öy/-üy/-y* suffix as an agent nominalization (68). A cognate of this suffix likely underlies Tz'utujil's *-oyoon/-uyuun/-yoon* agent focus perfect participle, as they share the agentive meaning and the same vowel harmony pattern (*o* varying to *u* with RTVs[30], no suffix vowel when added to a DTV stem).[31] Because this *-Vy* is an

[30] Kaqchikel lax vowels *ö, ü* correspond to short *o, u* in Tz'utujil and other K'iche'an languages.

agentive suffix and primarily occurs with transitive verbs, it is probably not related to the *-y(aj)* intransitive perfect in Ixil (see section 3.1.6).

KAQCHIKEL (García Matzar 2007: 21)

(68) *X-Ø-b'e chi ru-loq'-ik ch'ich' ri b'an-**öy** jay.*
COM-B3S-go PREP A3S-buy-NOM metal DET make-AGT house
'The [house-]builder went to buy iron.'

Note that while the agentive meaning of *-Vy* makes it the most obvious connection to the agent focus perfect participle, this analysis does leave open questions, in that the Tz'utujil perfect suffix *-oon/-uun/-n* cannot attach to a nominal base in any other context.

In Sakapultek, a seemingly related form *-uyoom* creates agentive nouns from antipassive stems ending in *-Vw*. Though it is not labeled as a perfect participle, Sakapultek *-uyoom* is likely cognate with *-oyoon/-uyuun/-yoon* in Tz'utujil; note that the Sakapultek form in (69) is translated with reference to a past event and has the same focus on the agent of the action.

SAKAPULTEK (Mó Isém 2007a: 197)

(69) *il-iw-uyoom*
see-AP-AGT
'the one who saw'

[31] Heaton and Maxwell's (2016) conference paper reports the existence of an *-oyon* Agent Focus perfect participle in Kaqchikel as well. They suggest the same origin: the *-öy/-üy/-y* agentive suffix, combined with the *-on* perfect (*-om* in other Kaqchikel varieties) (Heaton and Maxwell 2016: 11).

4.2.5.4. Preverbal **oje=tq** *and* **matx** *in Mam and Tektiteko*

Descriptions of Tektiteko list the auxiliary or proclitic *(o)je*, frequently followed by an enclitic *=taq* or *=tq*, as a marker of perfect aspect. These clitics occur with both transitive and intransitive verbs, and Pérez Vail refers to it as the "distant perfect" (2007: 118).

TEKTITEKO (Pérez Vail 2007: 119-120)

(70) ***(o)je*** *kye* *oye-n*
PERF A3P give-DEP
'they have given'

(71) *k'okyti'* *molest* *ky-etz* *komo* ***je=tq*** *b'an-t-ik* *t-e* *jay*
NEG bother A3P-RN as PERF=PERF do-PAS-IV.SUF A3S-RN house
'There were no problems for them, because the house had already been built.'

Oje comes from the adverb *ojee'* 'remote (time)', which is no longer a separate lexical item in Tektiteko (Pérez Vail 2007: 118). *ojee'* traces to proto-Mayan **onh-eer* 'long ago,' which includes the **-eer* "past time" suffix (Robertson et al. 2004: 264); other reflexes of **-eer* include the Ixil *-y(aj)* perfect (section 3.1.6) and the *-t* of Awakateko *-ij-t* and *-Vn-t* (section 4.2.5.2 above). I am uncertain of the origin of *=t(a)q*.

Another auxiliary (or proclitic) in Tektiteko with a perfect meaning is *matx*, from the adverb *maa'tx* 'recently'. *Matx* marks what Pérez Vail calls "recent perfect," which refers to situations relevant in the present context (Pérez Vail 2007: 120). Like *oje*, *matx* occurs with both transitive and intransitive verbs.

TEKTITEKO (Pérez Vail 2007: 121)

(72) a. ***matx*** *kye* *oq'*
PERF.REC A3P cry
'They have cried.'

b. ***matx*** *s-tz'-ok* *w-e-n* *kyaqil*
PERF.REC DEP-B3S-DIR.come A1S-see-DEP all
'I already saw everything.'

England glosses *oo* and *maa* in Northern Mam as 'past' and 'recent', though she calls them aspects rather than tense markers (England 1983: 286). These seem to correspond to *(o)je* and *matx* respectively in Tektiteko. Both combine with *-taq* which she glosses 'perfect' (73-74). *-taq* can also combine with lexical adverbs such as *ch'iin* 'a little' (75).

MAM (NORTHERN) (England 1983: 286-287)

(73) ***oo-taq*** *Ø-b'aj* *waa'-n* *Ø-Ø-xi* *q'o-'n-Ø* *t-k'aa'*
PST-PERF B3S-DIR eat-AP DEP-B3S-DIR give-DEP-PAS? A3S-drink
'He had eaten when they gave the drink.'

(74) *ajaj* *x-Ø-poon* ***maa-taq*** *n-chin* *waa'-n-a*
DEM DEP-B3S-arrive REC-PERF PROG-B1S eat-AP-1S
'When he arrived there, I was eating.'

(75) *ch'iin-**taq*** *Ø-txi'* *sajtz (x-tz'-aj-tz)* *iila-n* *w-i'j-a*
a.little-PERF B3S-go DEP-B3S-DIR-DIR scold-AP A1S-RN-1S
'He had walked a little way when they scolded me.'

Because Mamean languages lack an active transitive perfect suffix (having lost **-o-'m*; see the reconstruction of the active perfect in section 4.3), this created a gap, so that Mam and Teko grammaticalized temporal adverbs to represent the perfect aspect category with active transitive verbs.

4.2.5.5. Preverbal **san** *or* **jan** *in Chontal*

Like Mam and Tektiteko, Chontal has a preverbal perfect aspect particle, which appears as *san* or *jan* in the Tecoluta and San Carlos varieties respectively. *san* is originally from the Chontal adverb *sami* 'today', which still appears in negative perfective sentences (78) (Osorio May 2005: 88); Knowles does not suggest a source for *jan*. Knowles labels *jan* "recent past," while Osorio May calls *san* a perfective aspect particle. The main verb is always in perfective aspect (Knowles 1984: 230; Osorio May 2005: 87). Perfective aspect is marked by the suffix *-i*, which disappears when other suffixes are added to the verb (Osorio May 2005: 76).

CHONTAL (Knowles 1984: 230, Osorio May 2005: 87)

(76) ***jan*** *'u* *jätz'-i-Ø*
PERF A3 hit-PFV-B3
'He hit him recently'

(77) ***san*** *muk-on*
PERF bathe-B1
'I bathed (myself)'

(78) ***sami*** *mach* *'u-mek'-on*
today NEG A3-hug-B1
'(Today) s/he did not hug me.'

Vinogradov (2018: 271) argues that *san* marks perfect aspect on the basis of examples like (79), where the recency of the action is not in view, but rather the fact that the agent has performed that action at least once—the "experiential perfect" (Comrie 1976) or "existential perfect" (Condoravdi and Deo 2014).

CHONTAL (Vinogradov 2018: 272)

(79) ***jan*** *kä=k'ux-i* *we'e* *de* *tsimim*
PERF A1=eat-COM meat PREP horse
'I have eaten horseflesh.'

Like Mamean languages, Ch'olan languages lost the active transitive perfect suffix **-o-'m*, creating a gap that Chontal filled by grammaticalizing the adverb *sami* 'today' as a perfect auxiliary.

4.3. THE PROTO-MAYAN ACTIVE PERFECT

There is good evidence to reconstruct **(-o)-'m* to proto-Mayan as the perfect marker in active voice, an analysis also proposed by Kaufman who called proto-Mayan **(-o)-'m* the "perfect status" suffix of transitive verbs (2015: 288). As mentioned in section 4.2.1.3, reflexes of **(-o)-'m* appear as markers of perfect aspect in active voice in Yucatecan languages (except Mopan), most K'iche'an languages, and Teenek. No other suffix has such widespread use as an active transitive perfect marker; the others have such a limited distribution in the family that they are clearly innovative. Awakateko and Chuj both use reflexes of **-i-naq*, extended from intransitive to active transitive verbs (section 3.1.1.2). Ixil uniquely uses *-l(a')* (section 4.2.4.2 above). Mam, Tektiteko, and Chontal innovated preverbal particles to express a perfect meaning. Tseltal and Tsotsil use *-oj* or *-ej*, while

Tojolab'al uses the suffix *-uj~-unej* which I argue (in section 6.2.2.3) is related both to *-oj/-ej* and to **-i-naq*.

Where my analysis differs from Kaufman's is that he reconstructs a distinction between the verbal "perfect status" inflection **(-o)-'m* and a deverbal "active perfect participle/gerund" derivation **(-o)-ej*. In his view, **(-o)-ej* is the source of the Tseltalan "perfect status" *-oj/-ej* (2015: 319). I do not reconstruct the "perfect status"/"active perfect participle" distinction, for several reasons I discuss here (paralleling the discussion of the intransitive perfect markers **-i-naq* and **-e'm* in chapter 3).

First, no modern Mayan language has a distinction between a verbal and non-verbal active perfect construction. The closest is Ixil, which contrasts the *-l(a')* "perfect aspect" suffix with the *-el* or *-mal* "stative resultative" participle, as discussed in section 4.2.4.2 above. *-l(a')* is innovative and does not reconstruct to proto-Mayan. Further, the *-l(a')* perfect does not behave like the proto-Mayan "perfect status" construction: *-l(a')* in active voice co-occurs with the *qat=* cessive aspect proclitic (Adell 2019: 269), whereas in Kaufman's reconstruction, proto-Mayan "perfect status" **(-o)-'m* did not occur with an overt TAM proclitic (Kaufman 2015: 194).

Second, most of the active perfect reflexes of **(-o)-'m* can be analyzed as non-verbal predicates. In section 4.4.3 below, I give evidence that active perfect **(-o)-'m* is ultimately based on a (derivational) patient noun. One such piece of evidence that is relevant here is that the perfect does not occur with overt TAM proclitics like other verbal aspects—as mentioned, Kaufman himself reconstructs the perfect without a TAM proclitic in proto-Mayan (Kaufman 2015: 194). If active perfect **(-o)-'m* was a deverbal

form in proto-Mayan, this contradicts Kaufman's model where an inflectional **(-o)-'m* contrasted with a derivational **(-o)-ej*.

Third, there is not sufficient evidence to reconstruct a perfect meaning for **(-o)-ej* in proto-Mayan. In chapter 6, I reconstruct the same set of cognates as **-ooj/-uuj* in proto-Central Mayan and argue that its primary function was to create action nominalizations. While two descendant branches (Tseltalan and Poqom) use a reflex of **-ooj/-uuj* as a perfect suffix, I argue that these meanings developed independently.

4.4. THE PROTO-MAYAN PASSIVE PERFECT

Reflexes of **-b'il* and **(-o)-'m* appear widely across the family as markers of the passive perfect participle. Languages that use *-b'Vl* include all Western Mayan and Yucatecan languages as well as Q'eqchi', while a passive perfect *-Vm* appears in Eastern Mayan and Teenek. I reconstruct **(-o)-'m* to proto-Mayan and claim that **-b'il* was a later innovation, probably in proto-Western Mayan, which spread to other subgroups through contact. Kaufman, by contrast, reconstructed **-b'il* to proto-Mayan and claimed that Eastern Mayan extended **(-o)-'m* from active to passive contexts (Kaufman 2015: 319). In this section I present the evidence for both analyses and my arguments for reconstructing **-o'm* for this function, rather than **-b'il*.

4.4.1. Distribution in subgroups

The main piece of evidence for reconstructing *-*b'il* is its seeming ubiquity in Mayan subgroups. All Western Mayan and Yucatecan languages use -*b'il* (though Mocho' and Tojol-ab'al have a phonological variant -*ob'aal* or -*ub'al*). The K'iche'an language Q'eqchi' also uses -*b'il,* though as I discuss in section 4.2.2.1 and 4.4.2, its distribution is consistent with a borrowing from Ch'olan.

Kaufman's data table offers the form -*bil* 'thing V-en' in Teenek (Kaufman 2015: 313), which he refers to elsewhere as a "gerund" (Kaufman 2015: 320). He offers no citation for this form, but Edmonson (1988) lists a "moderately productive" form -*bilaab* which creates a noun denoting the patient of an action, which she segments as -*bi*-*laab* (80) (Edmonson 1988: 285). -*laab* 'generic' normally indicates an unpossessed form of an inalienably possessed noun as in (81) below, while -*bi* is unglossed.

TEENEK (POTOSÍ) (Larsen 1955, cited in Edmonson 1988: 285)
(80) *mat-bi-laab*
lend-?-GENERIC
'loan'

Conceivably, -*bi*-*laab* could underlyingly be -*bil*-*laab*. When two /l/'s are adjacent in Teenek, one of them will be elided, as in example (81).

TEENEK (POTOSÍ) (Edmonson 1988: 354)
(81) a. *'u* *chukul*
A1S stomach
'my stomach'

b. *chuk-laab'* (<*chuk(ul)-laab'*)
stomach-GENERIC
'stomachs (in general)'

More fieldwork might clarify the function of this suffix and the extent to which it is productive in varieties of Teenek. Regardless, *-b'il* does not appear to be the main passive perfect suffix in Teenek; *-aam-ej* has this role.

-Vm is present as a passive perfect participle in at least two subgroups: Teenek and Eastern Mayan. Other potential reflexes include the *-Vm* deverbal adjective found in Chontal and the *-om* passive suffix found in some Q'anjob'al varieties, discussed in section 4.2.1.1 above.

4.4.2. Geographic distribution

In this section, I argue that while *-b'il* has a wide geographic distribution, this distribution is consistent with a Lowland Mayan areal diffusion. Meanwhile, passive reflexes of **(-o)-'m* are also distributed widely but in a way that cannot be explained by contact. Figure 3 shows the distribution of languages that have *-b'il* as the perfect participle, while Figure 4 shows the distribution of languages with a passive reflex of **(-o)-'m.* Not shown in Figure 4 is Teenek, to the far northwest, with *-aam-ej*.

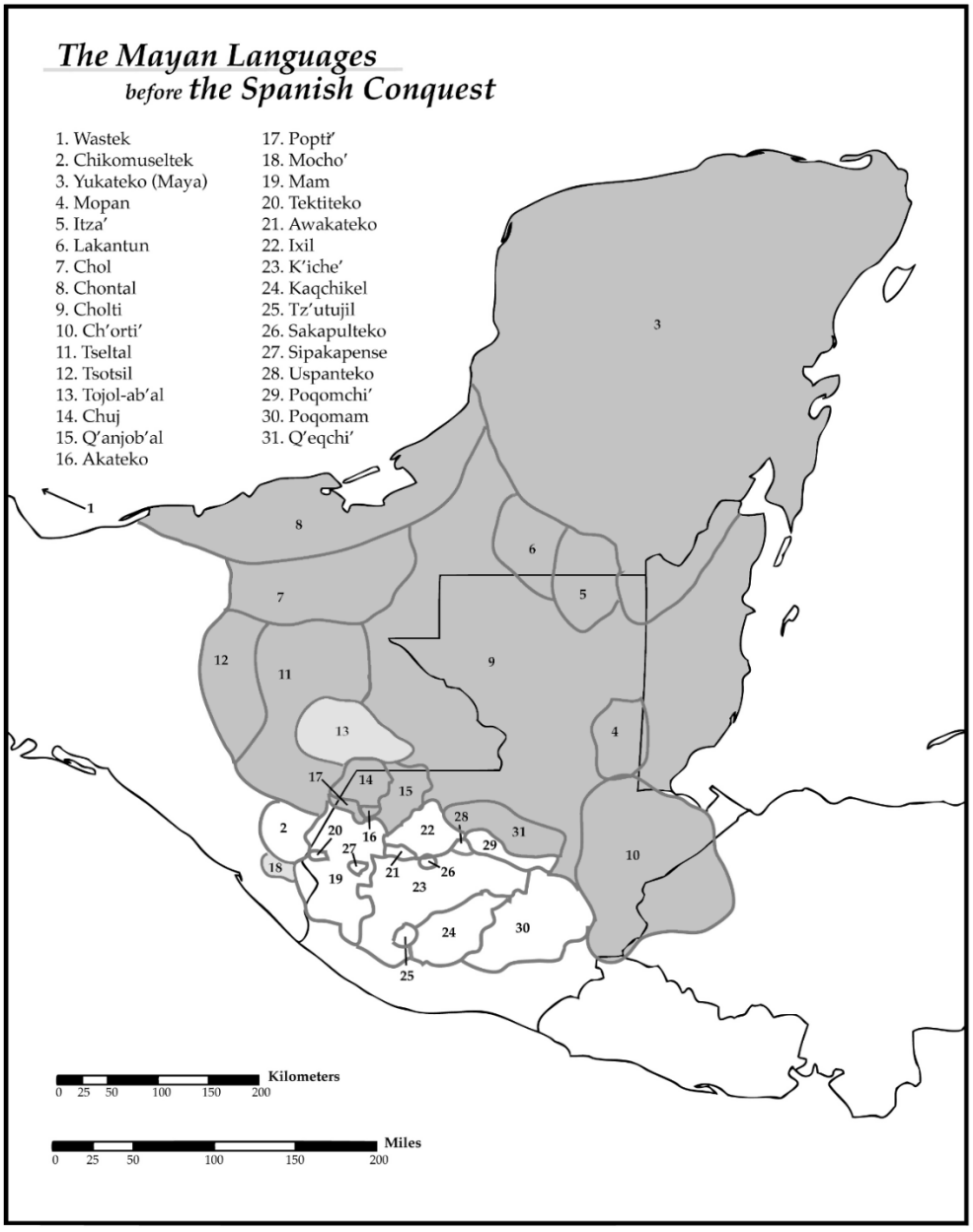

Figure 3: Geographic distribution of Mayan languages at the time of the Spanish conquest. Languages with *-b'il* are highlighted in medium gray, while *-Vb'al* (Tojol-ab'al and Mocho') is shown in light gray. Original language map from Law (2014: 23).

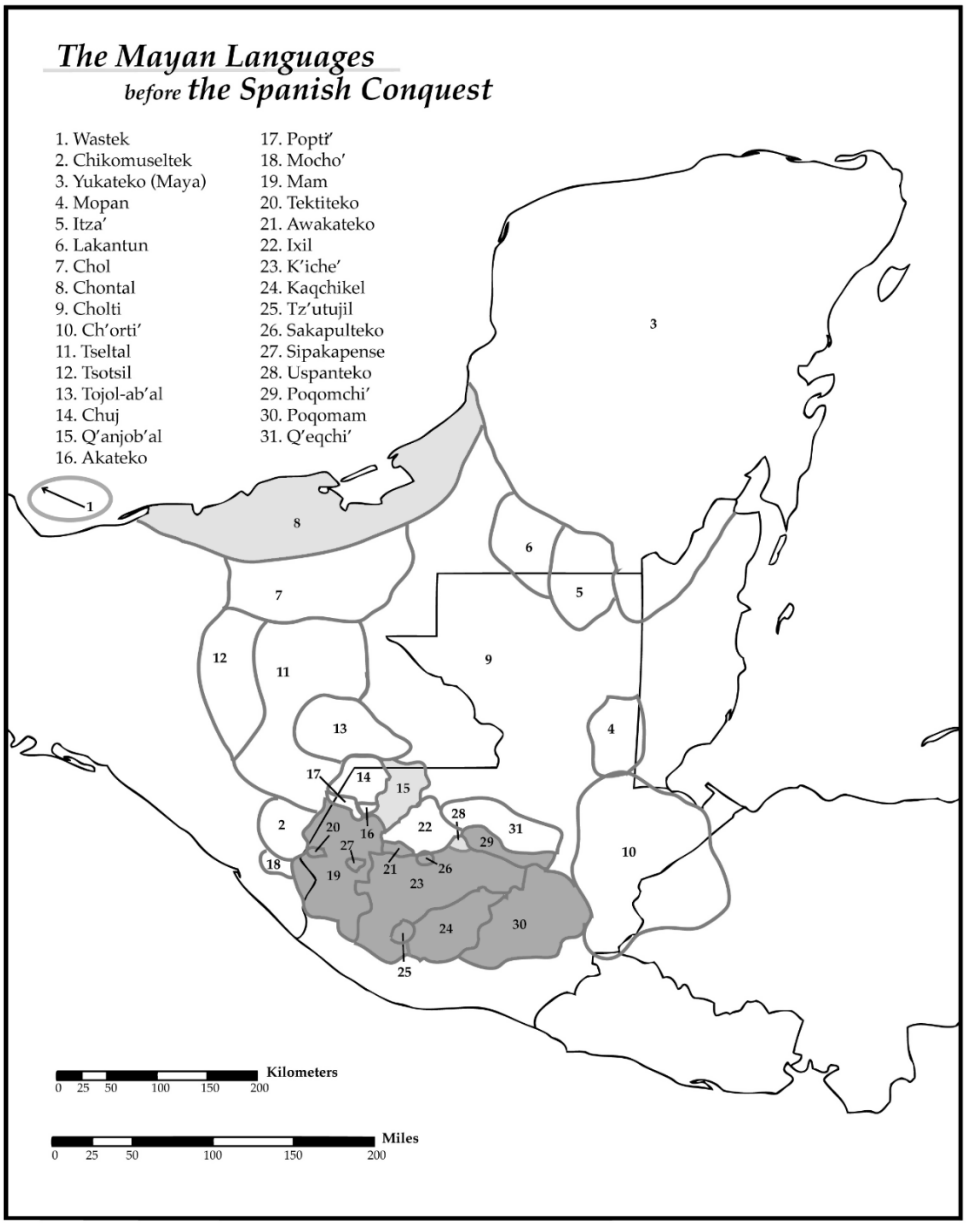

Figure 4: Geographic distribution of Mayan languages that have a passive-oriented reflex of **(-o)-'m*. Dark gray indicates that an **(-o)-'m* reflex is the passive perfect participle; light gray indicates that the suffix marks passive voice or a (not specifically perfect) passive adjective. Original language map from Law (2014: 23).

The first impression of Figure 3 is that the languages with *-b'il* cover a huge area. Besides the geographic spread, they represent a variety of subgroups: Yucatecan, Ch'olan, Tseltalan, Q'anjob'alan, and even K'iche'an. However, with the exception of Mocho', all of the languages with *-b'il* are contiguous and are known to have participated in other Lowland Mayan areal innovations.[32] Table 3 compares the distribution of languages with *-b'Vl* to the distribution of three Lowland areal sound changes (represented in IPA): the mergers of *r and *j, *ŋ and *n, and *q and *k (Law 2014: 35-44).

[32] Even if one accepts the presence of a *-bil* patient noun in Teenek (see section 4.4.1), it should be noted that Teenek also actively participated in Lowland Mayan areal innovations, as seen in Table 13.

		-b'il/ -Vb'al	Reflex of *r	Reflex of *ŋ	Reflex of *q
K'iche'an	K'iche'	no	r	χ[33]	q
	Kaqchikel	no	r	χ	q
	Tz'utujil	no	r	χ	q
	Sakapultek	no	r	χ	q
	Sipakapense	no	r	χ	q
	Poqomchi'	no	r	χ	q
	Poqomam	no	r	χ	q
	Uspanteko	no	r	χ	q
	Q'eqchi'	**yes**	r	h	q
Mamean	Mam	no	t	χ	q
	Tektiteko	no	t	χ	q
	Awakateko	no	t	χ	q
	Ixil	no	t	χ	q~x
Q'anjob'alan	Q'anjob'al	**yes**	**j**	**n**	q~x
	Akateko	**yes**	**j**	**n**	**k,** x
	Popti'	**yes**	**j**	ŋ	x
	Chuj	**yes**	**j**	ŋ	**k**
	Tojol-ab'al	**yes**	**j**	**n**	**k**
	Mocho'	**yes**	tʃ	ŋ	q
Tseltalan	Tseltal	**yes**	**j**	**n**	**k**
	Tsotsil	**yes**	**j**	**n**	**k**
Ch'olan	Ch'ol	**yes**	**j**	**n**	**k**
	Chontal	**yes**	**j**	**n**	**k**
	Ch'olti'	**yes**	**j**	**n**	**k**
	Ch'orti'	**yes**	**j**	**n**	**k**
Yucatecan	Yucatec	**yes**	**j**	**n**	**k**
	Mopan	**yes**	**j**	**n**	**k**
	Lacandon	**yes**	**j**	**n**	**k**
	Itzaj	**yes**	**j**	**n**	**k**
Wastekan	Teenek	?	**j**	x, w, Ø	**k**
	Chicomuseltec	NA	**j**	NA	**k**

Table 13: Distribution of *-b'il* compared to Lowland sound changes, in IPA. Based on Law (2014: 35-44).

[33] Law lists /x/, but this phoneme is generally pronounced as uvular in K'iche'an and Mamean languages.

Crucially in Table 13, known Lowland sound changes have a similarly wide distribution to *-b'il.* These sound changes crosscut multiple subgroups, but they are all clearly innovations and not retentions since they each involve a merger of two phonemes.

In particular, the *r>j sound change affected over half of Mayan languages, including nearly all of the languages with *-b'il.* The two exceptions are Q'eqchi' and Mocho' (which has *-ob'aal*). Mocho' is a Western Mayan language and may have inherited the suffix rather than borrowing it, as discussed in section 4.2.2.1. Q'eqchi' is known to have heavy lexical borrowing from Ch'olan languages (Wichmann and Brown 2003, Wichmann and Hull 2009) even though it did not participate in any Lowland sound changes. The fact that all other languages with *-b'il* share the *r>j sound change is consistent with the hypothesis that *-b'il* is an areal feature: that it originated in Western Mayan (Ch'olan, Tseltalan, and Q'anjob'alan) and spread to other languages of the Lowland sphere.

The distribution of passive reflexes of *-*o*-*'m* is also very wide, though it covers less geographic area than *-b'il.* I focus here on the passive reflexes of *-*o*-*'m* since this paper's claim is that the passive usage reconstructs to proto-Mayan; Kaufman (2015: 288) and the present work agree on reconstructing *-*o*-*'m* to proto-Mayan in active voice. Crucially, *-*o*-*'m* reflexes are attested as passive perfect participles both in Eastern Mayan languages and in Teenek, with additional reflexes in Chontal and Q'anjob'al (as discussed above) that are passive but not specifically perfect participles. These groups are geographically distant from one another, so that contact is not a good explanation, leaving only inheritance or independent innovation. Kaufman (2015: 320) states that

Eastern Mayan extended the active voice perfect **-o-'m* to passive contexts. While he does not say this explicitly, his analysis requires the same to have happened independently in Teenek, as Teenek uses perfect *-aam* in both active and passive situations, as well as the *-VVm* "stative participle" which can also be active or passive (Kondić 2012: 103).

Since extending a suffix from active to both active and passive contexts is essentially paradigm leveling, one could make a case for independent innovation. I address this in the next section where I show that extending a perfect suffix from active to passive voice is the opposite of the general trend in Mayan languages; in other observed cases, the extension tends to go in the other direction, from passive to active. It would thus be surprising to see an active>passive change happen twice independently.

4.4.3. Active perfect **(-o)-'m* derived from passive perfect

Active perfect markers in Mayan languages generally come from one of three sources. One is an extension of the intransitive perfect participle to transitive verbs: this happened in both Chuj and Awakateko, which extended intransitive *-naq* or *-nak* to active transitive verbs (sections 3.1.1.2 and 4.2.5.1 above). Another is recruitment of an unrelated morpheme: Western Ch'olan languages extended a *-V_Rl* stative participle to become the perfect participle (4.2.4.1), and Mam and Tektiteko recruited the temporal adverbs *matx* and *ojee'* as preverbal perfect aspect markers (section 4.2.5.4). The third and most common pathway in Mayan languages is an extension of the passive perfect participle

into active contexts. In this section, I argue that proto-Mayan **(-o)-'m* arose in this third way, coming originally from a passive perfect suffix, which implies that the use of **(-o)-'m* as a passive perfect participle reconstructs to proto-Mayan.

4.4.3.1. K'iche'an

As a starting point, I consider K'iche', which uses *-oom/-uum/-m* in both active and passive contexts. Only the presence or absence of an ergative Set A marker, referencing the agent of an active verb, distinguishes the two forms.

K'ICHE' (Larsen 1988: 236; Mondloch 1981: 124)

(82) *at* *nu-ch'ay-**oom*** (Active)
B2S A1S-hit-PERF
'I have hit you'

(83) *e'* *ch'ay-**oom*** (Passive)
B3P hit-PERF
'they have been hit'

Larsen suggests that the active perfect form is based on the passive perfect participle. The perfect participle can function as a patient noun, a noun indicating the patient of an action. This noun can be possessed using Set A prefixes:

K'ICHE' (Larsen 1988: 236)

(84) a. *mok-**oom***
ask.for.the.services.of-PERF
'(one who has been) asked for the services of; servant'

b. *nu-mok-**oom***
A1S-ask.for.the.services.of-PERF
'my servant'

The active perfect construction, even though it has a verbal meaning, may underlyingly be a non-verbal predicate. In (82), the form *ch'ay-oom* can be interpreted as a patient noun 'one who has been hit', which is possessed with a Set A prefix to create *nu-ch'ay-oom* 'my one-who-has-been-hit.' The Set B marker *at* 'you' could be interpreted as the subject of a non-verbal sentence, yielding the literal reading that Larsen suggests: 'you are my one-who-has-been-hit' (Larsen 1988: 238). Compare the parallel example (85), which has the possessed lexical noun *nu-k'ajool* 'my son' acting as a non-verbal predicate with *at* as its subject.

K'ICHE' (Larsen 1988: 238)
(85) *at* *nu-k'ajool*
B3S A1S-man's.son
'You are my son'

Under this analysis, the morpheme order in an active perfect construction ends up identical to that of a finite transitive verb: Set B, then Set A, then the root (86).

K'ICHE' (Larsen 1988: 426)
(86) *x=Ø=k'a'n-ar-ik* *chiri'* *x=Ø=**in**-ch'ay-o*
COM=B3S=angry-VERS-IV.SUF when COM-B3S-A1S-hit-RTV.SUF
'He got angry when I hit him.'

The ambiguity between verbal and non-verbal analyses of the perfect arises because Set A and Set B person markers in Mayan languages have multiple uses: Set A marks either possessor agreement on nouns or agent agreement on transitive verbs. Set B can mark either the subject of a non-verbal predicate or the absolutive argument of a verb (intransitive subject/transitive object). However, there are key differences that resolve this ambiguity.

In K'iche', the nominal and verbal Set A prefixes differ in 1st person singular: nouns take *nu-* before consonants and *w-* before vowels, while verbs take *in-* before consonants and *inw-* before vowels (Larsen 1988: 213).[34] Perfect constructions take the nominal version, *nu-/w-* (Larsen 1988: 237-238). It is worth noting that the sharp distinction between the nominal and verbal sets in K'iche' is a recent innovation: in colonial K'iche', consonant-initial transitive verbs used *nu-* obligatorily in incompletive aspect, and in free variation with *in-* in other aspects (Brasseur 1862: 44, cited in Larsen 1988: 214). The key observation here is that even while the 1st person singular Set A marker was regularized to *in(w)-* in other aspects, perfect constructions still use *nu-/w-*, which suggests that speakers see perfect constructions having a closer affinity with nouns than with finite verbs.[35]

[34] Exceptions exist. The high-frequency verb *-aaj* 'want' takes *w-* as its 1st person singular Set A marker, while a small set of noun roots take *in-* instead of *nu-* in some dialects (Larsen 1988: 213, Par Sapón and Can Pixabaj 2000: 61-62).

[35] Other interpretations are possible: for example, that the lack of an overt aspect marker somehow blocked the extension of *in(w)-* to perfect participles, perhaps to avoid creating a vowel-initial word. This alternative explanation does not seem to fit the data, however, as K'iche' freely allows the vowel-initial Set A markers *a(w)-* and *i(w)-* in 2nd person singular and plural respectively (Larsen 1988: 101). It is also admittedly possible that we are looking at a change in progress, and that by coincidence, the perfect just happens to be the last holdout of *nu-/w-*.

The form of the Set B morphemes is identical between verbal and non-verbal predicates. However, Dayley (1985), writing about the closely related language Tz'utujil, offers support for the idea that the Set B marker on the perfect behaves more like the subject of a non-verbal predicate. Dayley treats Set B markers as "*prefixes* on nonperfect verbs and *proclitics* on perfect verbs and stative predicates" (Dayley 1985: 62, my emphasis). To justify this distinction, he appeals to native speaker intuitions: "When asked, native speakers usually state that in the perfect the absolutive markers are *in some ways part of the following verb word and in some ways not part of it.* But with respect to the nonperfect forms, they consistently state that the absolutive markers are *definitely part of the verb word"* (Dayley 1985: 138, my emphasis).

Besides the evidence from person marking, finite verbs generally require an overt aspect proclitic as in (86), while perfect constructions like (82) nearly always lack an aspect proclitic (Ixil's innovative *-l(a')* is a major exception, co-occurring with the *qat=* cessive proclitic; see section 4.2.4.2 above.) Kaufman (1990: 72) tries to reconcile the perfect with other finite verbal forms by assigning it a null aspect proclitic, but in my view (and Larsen's), this gap is consistent with the other evidence presented above that perfect forms are non-verbal predicates.[36]

[36] According to Elizabeth Wood (p.c.), intransitive perfect participles in the Chichicastenango variety of K'iche' also follow the stress pattern for nouns instead of verbs. In Chichicastenango K'iche', historic long vowels were reinterpreted as tense vowels, while historic short vowels became lax or were deleted. In Chichicastenango, verbs have weight-sensitive stress (stress will fall on a syllable with a tense vowel if there is one), while nouns have final stress regardless of syllable weight. Intransitive perfect participles in *-näq*, such as *b'enäq* 'has gone', take final stress even when there is a tense vowel in the earlier syllable, following the nominal stress pattern. Transitive perfect participles in *-om* have a tense vowel in the final syllable, which leads to final stress in either the nominal or verbal stress pattern, and so the evidence is inconclusive for *-om.* However, I suggest that at least by analogy with intransitive perfect *-näq*, the evidence from Chichicastenango K'iche' is consistent with a non-verbal analysis of the *-om* perfect.

In Q'eqchi', a K'iche'an language less closely related to K'iche' than Tz'utujil is, Kaufman (1976b: 77) records an *-(o)m* active perfect suffix, but this usage does not seem to be prominent in the language. However, Q'eqchi' uses *-om* very widely as a patient noun. Depending on the time reference, this can be translated as "what has to be Verbed" as in (87), or "what has been Verbed" as in (88). The latter, because it describes a result state, approaches the meaning of a perfect construction; however, in all cases I have found, the free translation very clearly treats the form as a patient noun used statively, rather than as a verbal predicate.

Q'EQCHI' (CLQq 2004: 38, 49)

(87) *Xiikil* *x-b'ak'-**om*** *aj* *Xiwan.*
many A3-tie.up-PAT AGT Juan
'Juan has a lot to tie up.'

(88) *Ha'an* *a'in* *x-b'is-**om*** *li* *ixq.*
this this A3-measure-PAT DET woman
'This is all that the woman weighed' (lit. 'These are all the woman's things-that-were-weighed')

The evidence presented above shows that the K'iche' *-oom/-uum/-m* perfect (along with its close cognates in K'iche'an) may really be a non-verbal form. Even if one insists that it is a verbal predicate in modern K'iche', then at minimum, it must have come from a non-verbal patient noun diachronically. Kaufman also references the nominal basis of the perfect, though he does not pursue the analysis I have presented here.

> Note that the perfect T[ense]-A[spect] category may be based on a nominalization—gerund or participle—even in p[roto]-M[ayan]; no Asp[ect]

> marker is used. Note also that in Indo-European languages the perfect participles of transitive verbs have a passive interpretation when functioning as adjectives, but an active interpretation when used with an auxiliary to represent the category perfect tense/aspect. (Kaufman 2015: 319-320)

I emphasize here that if the *-Vm* active perfect in K'iche'an languages comes from a passive perfect participle (underlyingly a patient noun), then this must have already been the case in proto-Mayan. As I argued in section 4.3 above, reconstructing **(-o)-'m* in active voice is uncontroversial. If so, its source, passive perfect **(-o)-'m,* must also have been present. In other words, K'iche' preserves the proto-Mayan pattern.[37]

4.4.3.2. Possible -Vm patient nouns outside of Eastern Mayan

Some colonial Tsotsil and (unproductive) Ch'olti' examples contain what looks like an *-om* patient noun (89-90). Law (2014: 120) treats this *-om* as a cognate of the intransitive participle *-em*, but the translation suggests that they are acting like patient nouns. Wald states that *tz'et* is a passive stem in (89), not the root; passive forms of transitive roots are often identical to the active form in Tsotsil (Wald 2007: 448). If the stem is already passive (and therefore intransitive), then this *-om* may be creating an intransitive subject nominalization instead of a patient nominalization as such.

[37] Note that if one accepts my analysis for proto-Mayan, where the **(-o)-'m* active perfect is derived from a patient nominalization, this extension must have happened at some point in time prior to the breakup of proto-Mayan. This suggests an even earlier stage of pre-proto-Mayan where **(-o)-'m* was only a patient noun without the active perfect usage. We can only speculate about whether this pre-proto-Mayan stage lacked an active perfect construction entirely, or if it marked the active perfect in a way that no modern Mayan language preserves. I mention this detail because it is worth exploring how much mileage we can get from internal reconstruction of the grammatical system, and it could be relevant to the search for distant genetic relationships between Mayan and other language families.

COLONIAL TSOTSIL (Laughlin 1988: 834, cited in Wald 2007: 444; glosses by Law 2014: 120)

(89) *j-tz'et-om*
A1S-cut.upright.things-STAT
'(They are) my cut (upright) things.'

COLONIAL CH'OLTI' (Morán 1695, cited in Law 2014: 121)

(90) a. <colom>
kol-om
seize-NOM
'that which is seized in war'

b. <v-colom tzi>
u-kol-om *tz'i'*
A3S-seize-NOM dog
'what the dog hunts'

The Yucatecan language Lacandon uses a reflex of **-o'm* in patient nouns. Bruce (1968) reports examples from Lacandon where *-män* (which Hofling 2017: 709 treats as an active voice perfect marker) acts as a patient noun (91). Several of these have idiomatic meanings, which could indicate that the use of *-män* as a patient noun is not productive. Some of Bruce's examples have an agentive rather than patientive meaning (92).

LACANDON (Bruce 1968: 74)

(91) a. *jich'-män* 'strong knot' < RTV *jich'-* 'tie strongly'
b. *mäch-män* 'simple knot' < RTV *mäch-* 'to grab, hold'
c. *'il-män* 'something seen, known' < RTV *'il-* 'see'
d. *'oo-män* 'something known' < RTV *'oj-* 'know'

(92) *kin-s-man* *(winik)*
die-CAUS-AGT man
'murderer, killer of people'

However, *-man* or *-män* in Lacandon is a contraction of two suffixes, the *-maj* perfect and the general participle *-a'an* (Hofling 2006: 376, compare 93 to 94 from Itzaj). *-a'an* can create passive participles of transitive verbs in Yucatecan languages (Hofling 2017: 704) so that it is possible the patientive meanings in (91) come from *-a'an* rather than from *-maj*. Note that (94) from Itzaj which uses *-maj-a'an* focuses on the agent of the action, very similar to (92) which has the contracted form *-man*.

SOUTHERN LACANDON (Hofling 2017: 710)
(93) *aw-il-**män**-Ø*
A2-see-PERF-B3S
'you have seen her/him/it'

ITZAJ (Hofling with Tesucún 2000: 170)
(94) *litz-**m-aj-a'an***
fish-PERF-COM-PTCP
'has been a fisher, has fished'

4.4.3.3. Patient noun to active perfect with other suffixes

The same reanalysis of a patient nominal as an active perfect construction can be observed with the *-ooj/-uuj* suffix in Colonial Poqomam and late-1800's Poqomchi'. I discuss this change at length in chapter 6 (especially section 6.4.2) which covers the diachrony of the **-ooj/-uuj* suffix. In summary, the nominalization *-ooj/-uuj* is used as a passive perfect participle in Poqom. Colonial and early modern sources show it being used as a patient noun, which is then possessed, creating a construction that is underlyingly a possessed nominal, but can be interpreted with a perfect aspect reading

(cf. example 82). Morán translates (95) as ‘We are the creation of God’, a meaning equivalent to ‘God has created us’, while Stoll expressly treats (96) as ambiguous between the nominal ‘It is my shot’ and verbal ‘I have shot [it]’.

COLONIAL POQOMAM (Morán 1720: 14)
(95) *oj* *ru-b’an-**oj*** *Dios*
B1P A3S-do.make-PERF God
‘we are the creation of God’

POQOMCHI’ (Stoll 1888: 87)
(96) *Ø* *nu-ch’ab’-**uj***
B3S A1S-shoot-PERF
‘I have shot [it]’ (lit. ‘it is my shot’)

As one final example, Akateko extended passive perfect participle *-b’il* to active contexts as discussed in section 4.2.2.3 (example 32 repeated here as 97). This innovation must have happened fairly recently, as it is not attested in Q’anjob’al or Popti’, Akateko’s closest relatives.

AKATEKO (Zavala 1992: 59)
(97) *in-a-ma’-**b’il**=an*
B1S–A2S–hit–PERF=CL1S
‘you have hit me’

Because there are not many examples of active perfect *-b’il*, there is not enough evidence to confirm that Akateko followed the same pathway as in K’iche’ and Poqom, where a patient noun is possessed and used as a verbal construction. Nevertheless, it is another

example of an active perfect construction derived from a passive perfect participle, illustrating that this is a common direction of change.

4.4.4. Evidence against ACTIVE>PASSIVE paradigm leveling in Teenek

I presented evidence above that active perfect **-o-ʼm* is based on the passive perfect participle. Kaufman's analysis, where proto-Mayan **-o-ʼm* represents perfect status only on active transitive verbs, requires the opposite direction of change: that **-o-ʼm* was extended from active to passive contexts in both Teenek and Eastern Mayan. This implies that Teenek innovated by extending active perfect *-aam* to passive and antipassive contexts, as it now allows all three (27 repeated here as 98).

TEENEK (SOUTH EASTERN) (Kondić 2012: 116)

(98) a. *chʼaʼ-y-**aamal***
buy-TV-PERF.ACT
'has bought'

b. *utx-**aamej***
tell-PERF.PAS
'have been told'

c. *thutx-m-**aamath***
write-AP-PERF.AP
'has written'

d. *aath-l-**aamath***
run-AP-PERF.AP
'has run'

The antipassive context is clearly innovative in that Teenek attaches the *-aam* perfect suffix directly to the antipassive stem. In any other Mayan language with a *-Vm* perfect, *-Vm* can only attach to a transitive stem; an intransitivized stem will select for the intransitive perfect suffix (see examples 2-3, discussed above in section 4.1). Unlike the *-aam-ath* antipassive perfect, the passive perfect *-aam-ej* in Teenek does not attach to an intransitivizing suffix, but instead attaches directly to the transitive base, just like the passive reflexes of **-o-'m* in Eastern Mayan languages. *-aam-ej* never attaches to passive stems; it is in complementary distribution with the *-aaj* or *-at* "completive passive" and *-aap* "incompletive passive" (99).

TEENEK (SOUTH EASTERN) (Kondić 2012: 204)

(99) a. *thay-**aaj***
raise-COM.PAS
'it was raised'[38]

b. *thay-**aap***
raise-INC.PAS
'it is raised'

c. *thay-**aamej***
raise-PERF.PAS
'it has been raised'

If *-aam* was extended from active verbs to passive and antipassive contexts at the same time, one might expect it to be able to stack on a passive suffix (e.g., **thay-aaj-aamej*), as it can with antipassive stems. The fact that passive *-aamej* attaches directly to the

[38] Kondić does not provide free translations for these three examples; I have inferred the translation from her discussion of the suffixes.

transitive stem suggests, minimally, that there is an inherent structural difference between passive and antipassive perfects; and more likely, that the appearance of *-aam* in passive contexts is an older use of the suffix, consistent with the cross-linguistic observation that older affixes tend to appear closer to the root (see Mithun 2000 for discussion of this principle). Because the distribution of passive perfect *-aamej* in Teenek is unexpected with respect to the antipassive, whereas it does match the behavior of the Eastern Mayan passive perfect, this is supporting evidence that the Teenek and Eastern Mayan passive perfect forms are cognate, not independent innovations.

4.4.5. Plausible origin of *-b'il*

As shown in section 4.2.2.4, multiple Mayan scholars have proposed a morphological breakdown of *-b'il* into an earlier *-*Vb'* and *-*Vl* suffix. Smailus (1975, cited in Knowles 1984: 249) analyzes Chontal *-bil* as the instrument nominalization *-ib* plus the abstract noun suffix *-il*, while Kaufman treats proto-Mayan *-*b'il* as a combination of the *-*(-a)-b'* "unbounded passive" suffix and a *-*Vl* nominalizing suffix (2015: 320). I favor the passive origin over the instrumental because, as stated in section 4.2.2.4, the instrumental seems to be distinct historically; many languages have a *-b'al* instrument nominalization alongside the *-b'il* participle.

Even though its exact composition is not certain, the idea that *-b'il* is multimorphemic is consistent with my view that it is a younger suffix, created after the breakup of proto-Mayan. Speakers of an intermediate proto-language such as proto-

Western Mayan could have created *-*b'il* by combining two existing derivational suffixes. This conclusion is not inescapable; the suffix could have been multimorphemic even in proto-Mayan, which appears to be Kaufman's view. Nevertheless, the point here is that if *-*b'il* appeared later in the timeline, there was a plausible source; it did not come out of nowhere.

4.4.6. Diversity of reflexes

In this section, I show that the passive reflexes of **(-o)-'m* are highly variable, both in form and function, while the observed cases of *-b'il* are mostly homogeneous. I suggest that the wide variety of reflexes of **(-o)-'m* point to it being the older suffix, having had more time to diversify and be affected by phonological and morphological changes.

To be clear, here, I am only focusing on the reflexes of **(-o)-'m* that appear in passive voice or are otherwise patient-oriented. The active perfect **(-o)-'m* straightforwardly reconstructs to proto-Mayan. However, contrary to the idea that *-*b'il* was the original passive perfect participle and **(-o)-'m* only later took on this function (Kaufman 2015: 319), I suggest that the passive perfect **(-o)-'m* is much older than *-b'il* due to the wide diversity of the patient-oriented reflexes of **(-o)-'m* and the relative uniformity of *-b'il* suffixes.

In terms of form, nearly every language with a reflex of *-*b'il* simply has *-b'il.* Ch'orti' has *-b'ir* by a regular *l>r sound change. Mocho' and Tojol-ab'al have *-ob'aal* and *-ub'al* respectively. In terms of its contexts of use, *-b'il* is invariably the passive

perfect participle of transitive verbs. The only exceptions are Akateko, which has extended *-b'il* to active voice, and Tumbalá Chol, which uses *-b'il* with intransitive verbs (see section 4.2.2.3). As discussed above in section 4.2.2.4, some Mayan languages have a suffix *-b'Vl* which forms instrument nominalizations from transitive verbs, but Kaufman (2015: 314) treats these as unrelated to participial *-b'il*, an analysis with which I concur.

By contrast, the passive reflexes of **(-o)-'m* show a much wider variety of form and function. Several languages use a reflex of **(-o)-'m* as the passive perfect participle. Within these, K'iche' has *-oom/-uum* with root transitive verbs and *-m* with derived transitive verbs. In Tz'utujil and some varieties of Kaqchikel, the final *m* changed to an *n*: Tz'utujil has *-oon/-uun/-n*. The perfect participle in Mam is *-'n* which has a final *m>n* change (reduced even further to *-' ~ -n* in Tektiteko). Non-Mamean languages lost the glottal stop and compensated by lengthening the suffix vowel. Meanwhile, the perfect participle in Sakapultek, Sipakapense, Poqomchi', and Poqomam is *-maj*, probably due to the combination of **(-o)-'m* with an **-aj* passive suffix (chapter 5). On the other side of the family, Teenek's passive perfect suffix is *-aam-ej*, with an *-ej* passive suffix added (apparently independently of the Eastern Mayan languages with *-maj*). Ixil's "stative resultative" participle is *-mal*, which appears to be another reflex of **(-o)-'m* with an accreted *-Vl* suffix.

Outside of the participial reflexes, while Uspanteko and Poqomchi' have a passive suffix *-maj* (the Poqomchi' suffix often harmonizes with the root becoming *-mV$_R$j*). In Uspanteko, the *-maj* passive (the "completive passive") appears only in dependent

clauses referencing a prior action, while the Poqomchi' *-maj* passive can appear in matrix clauses (Can Pixabaj 2007: 177; Mó Isém 2006: 222). Both of these plausibly come from passive participial reflexes of **(-o)-'m*.

The relative uniformity of the reflexes of **-b'il* is expected if it spread fairly recently through contact. Likewise, if **(-o)-'m* originally had a passive participial function in proto-Mayan, one would expect a great deal of complexity due to the time it has had to diversify. In combination with the fact that *-b'il* looks multimorphemic and could have had a post-proto-Mayan origin, as well as the evidence from directionality of change discussed in section 4.4.3, this supports the case that *-b'il* is a younger suffix and **(-o)-'m* was the original passive perfect participle.

4.4.7. Plausibility of morphological borrowing

Prior studies of language contact distinguish two types of borrowing: "transfer of fabric" or "matter replication," direct borrowing of morphemes from a source to a recipient language, and "transfer of pattern" or "structural convergence," where grammatical structures of the recipient language assimilate to those of the target language without any overt transfer of morphemes (Heath 1984; Nau 1995; Grant 2002; Heine and Kuteva 2003, 2005; Matras and Sakel 2007). The areal diffusion of the *-b'il* suffix in Lowland Mayan languages is an example of matter replication.

Winford (2005) and Seifart (2015) speak of "direct" and "indirect" affix borrowing, two types of matter replication. Indirect borrowing occurs when an affix

enters the recipient language through loanwords and is (perhaps) later extended to native roots, while direct borrowing occurs when speakers of the recipient language immediately apply a foreign affix to native roots, with or without loanwords. King (2000) advances the idea that all borrowing is indirect ("lexically mediated"): that is, all supposed grammatical borrowing (morphological, syntactic, semantic) is the result of loanwords driving language-internal reanalysis in the recipient language. Seifart (2015), by contrast, treats direct and indirect affix borrowing as a scale: *both* mechanisms could have driven the borrowing of a given affix, depending on speakers' knowledge of the donor language and the extent to which loanwords were involved as an intermediary (Seifart 2015: 527). In the case of *-b'il*, by all indications it is completely productive in the languages that have it. No source indicates competition between *-b'il* and another affix that might be construed as a split between native and non-native roots. This strongly suggests that direct affix borrowing played a role.

Note that a slightly more complex account of the diffusion of *-b'il* is possible. I have argued that two suffixes of the general form *-*Vb'* and *-*Vl* (probably a passive and nominalizing suffix respectively) combined to form the *-*b'Vl* passive perfect participle in proto-Western Mayan. As noted in sections 4.2.2.4 and 4.4.5, -*Vb'* and -*Vl* derivational suffixes with related meanings are present across the family. Even if the use of *-b'il* as a perfect participle spread from Western Mayan to Yucatecan, Teenek, and Q'eqchi', it is possible that they did not borrow *-b'il* directly as a single morpheme. Rather, if these languages also preserved a -*Vb'* passive and -*Vl* nominalization, they could have innovated *-b'il* by combining these two suffixes as happened in proto-Western Mayan.

This would not have been an independent innovation; in this scenario, the recipient languages were motivated to innovate *-b'il* by the presence of a similar suffix in Western Mayan languages with whom they were in contact. However, this process is not matter borrowing in the strict sense because *-b'il* is not being "borrowed" as such; the recipient language innovated *-b'il* from its own resources on the model of the Western Mayan suffix (a "pattern borrowing," but one motivated by a form encountered in the donor language). For the rest of this section, I will follow the more straightforward analysis of treating *-b'il* as a simple matter borrowing, but the idea of a contact-driven parallel innovation deserves further research.

Direct borrowing is facilitated by structural identity between the recipient and donor languages (Winford 2005: 387; Law 2013; Thomason 2015: 29). This condition is met in Mayan languages: beyond their overall typological similarity, all Mayan languages have a perfect participle category expressed as a suffix that attaches to the verb root. Thus, a speaker bilingual in two Mayan languages would likely have (subconsciously) identified the perfect participles of both languages as parallel structures ("interlingual identification" in the terms of Weinreich 1953: 7, cited in Law 2014: 180), a situation conducive to borrowing a participial suffix directly. Law (2013) appeals to the parallel structure among Mayan languages to explain Lowland Mayan areal features such as the loss of the Agent Focus construction, the direct borrowing of numeral classifier suffixes, and restructuring of the person agreement system.

Certain sociolinguistic situations lend themselves to direct affix borrowing. Direct borrowing requires at least partial competence in the donor language grammar and not

just knowledge of isolated loanwords (Seifart 2015: 515); Thomason (2015) suggests that even passive familiarity with the source is sufficient. Law points out that in a multilingual context, the choice of which grammatical form to use is socially loaded and signals the extent to which the speaker aligns with one group or another (Law 2014: 169). Matras similarly states that because morphology is responsible for the delivery of the predicate, rather than its content, speakers may use it to flag their language loyalty (Matras 2015: 48). A bilingual speaker will normally have two competing pressures: cognitive pressure to simplify processing by making their two languages more similar, and social pressure to maintain a distinction between their two languages; Matras invokes the latter as a factor that commonly blocks borrowing of inflectional morphology (Matras 2015: 66). That said, if an affix crosses the boundary between languages—if a bilingual speaker begins using a donor language affix in the recipient language—the innovation may spread and become accepted in the recipient language community, if the original borrower has sufficient influence in the community (Seifart 2015: 515).

In the Maya area, the hieroglyphic evidence indicates that Ch'olan speakers were socially dominant during the Classic Period (200-900 A.D.) when many of the Lowland changes occurred—as Campbell put it, "Cholan(-Tzeltalan) speakers were the principal bearers of Classic Maya civilization" (Campbell 1984: 7). For similar points, see Fox and Justeson 1984: 76; Kaufman and Norman 1984: 145-146; MacLeod 1984; Justeson et al. 1985: 9; Houston et al. 2000; Mora-Marín 2009; Law 2014: 158).[39] In addition, language

[39] Law points out that the (Ch'olan) language of the hieroglyphs itself lacks many characteristic Lowland Mayan areal innovations, suggesting that the spoken form (the direct ancestor of Ch'olti' and Ch'orti') was much more influential in the contact situation than the written language (Law 2014: 11).

boundaries were likely not as salient socially before the Spanish conquest, and one's identity was more closely tied to one's town or larger political unit, which did not always coincide with language (Law 2014: 170-171). Law appeals to these factors to explain the relative ease of phonological and structural diffusion in the Lowlands (Law 2014: 159). The sociolinguistic relationships among Mayan languages in this period deserve further study, but the above discussion suggests that if speakers were at least passively bilingual in another Mayan language and identified enough with that language community, direct borrowing of *-b'il* could occur.

Prior research has identified other examples of affixes that diffused in the Lowland Mayan area, though none are as widespread as *-b'il*. Justeson et al. (1985: 9) mention some potential candidates, which are shared exclusively by the Ch'olan and Yucatecan subgroups: the suffixes *-tal* and *-na* which appear with positional and affect roots respectively. Justeson et al. merely mention these suffixes' distribution and stop short of offering an account of their innovation and diffusion; Kaufman and Justeson later (2009) show that Ch'olan (and presumably also Yucatecan) borrowed *-na* from unrelated Mixe-Zoquean languages. Law et al. (2006) treat the completive proclitic *ti=* as a borrowing from Yucatecan languages into Chol. Law additionally identifies the Ch'olan/Yucatecan 3rd person ergative prefix *uy-*, 1st person singular absolutive suffix *-en*, and 3rd person plural suffix *-oob'* as areal features, and considers the Ch'olan second person *-et* suffix as a borrowing from Western Ch'olan into Eastern Ch'olan after their divergence (Law 2009: 227-229; 2014: 97-103). Ch'olan-Tseltalan and Yucatecan languages share specific numeral classifier suffixes, which Law (2013: 282; 2014: 60,

2020) argues is partially due to direct affix borrowing. Colonial Yucatec ritual texts used an *-oom* future suffix, borrowed from Classic Mayan (Law 2014: 123). These serve as evidence that affix borrowing is not only plausible, but did occur regularly in the Lowland Mayan linguistic area.

4.5. CONCLUSION

This chapter has examined the diachrony of perfect marking that occurs with transitive verbs in Mayan languages. After examining each of the major transitive perfect suffixes separately, I presented a case that **(-o)-'m* reconstructs to proto-Mayan as the transitive perfect suffix in active and passive contexts, based on how widespread the suffix is in separate branches of the family that have not been in contact. The basic reading of **(-o)-'m* is as a patient nominalization, which is interpreted as a perfect aspect marker when used as a predicate; I have shown that this is a common pathway for perfect markers to arise in Mayan languages. *-b'il*, a suffix that marks passive perfect participles in Western Mayan and Yucatecan languages, was a later innovation that spread areally in the Lowland Mayan linguistic area. This analysis accounts for the fact that passive reflexes of **(-o)-'m* are extremely widespread and diverse, while reflexes of *-b'il* occur in a (mostly) geographically contiguous area that is known for widespread grammatical borrowing.

The biggest open question remaining in this chapter is the origin of the *-Vl* perfect participle found in Ch'olan-Tseltalan, Yucatecan, Ixil, Uspanteko, and Tojol-ab'al. I have presented a case here that *-Vl* developed in Ch'olan-Tseltalan from a stative participle suffix that occurred with positional roots. I claim that whether through direct affix borrowing, contact-induced innovation, or a combination of the two, the use of the stative *-Vl* suffix as a perfect participle spread to the other languages (all of which are part of the Lowland Mayan linguistic area). However, *-Vl* derivational suffixes are so ubiquitous across the family that it will take more study to conclusively identify which ones are cognate.

The next two chapters focus on transitive perfect suffixes that raise particular analytical questions. Chapter 5 focuses on *-maj*, a perfect participle that I argue to have been spread through language contact in highland Guatemala. Chapter 6 examines the distribution and function of **-ooj/-uuj*, a proto-Central Mayan action nominalization that developed into a perfect marker in Poqom, Tseltalan, and Tojol-ab'al.

5. Perfect *-maj* and direct affix borrowing in the Sacapulas Corridor

Three subgroups of Mayan languages have a perfect suffix of the general form *-mVj*, a variant of **(-o)-'m.* The form *-maj* appears through several Eastern Mayan languages of Guatemala (/-maχ/ in IPA), as well as in Yucatecan languages (/-mah/). Teenek has a passive perfect suffix *-aam-ej* (/-aːmex/) which can also be added to this. I will argue that Eastern Mayan *-maj* has a distinct origin from the Yucatecan and Teenek forms: Eastern Mayan *-maj* is a combination of the **(-o)-'m* perfect with a **-aj* passive suffix, while Yucatecan *-maj* and Teenek *-aamej* include an *-aj* or *-ej* completive aspect suffix. The distribution of the suffix within Eastern Mayan languages does not match the established subgrouping, but instead maps well to a known trade route through the Cuchumatán mountain range of highland Guatemala, a contact zone that I call the "Sacapulas Corridor." I claim that the Eastern Mayan *-maj* suffix originated in proto-Poqom and spread westward along the Sacapulas Corridor through language contact.

5.1. DISTRIBUTION OF *-MAJ* IN EASTERN MAYAN

Table 14 shows transitive perfect morphology in Eastern Mayan languages, with all participial instances of *-maj* bolded.

Branch	Language	Active		Passive	
		RTV	DTV	RTV	DTV
K'iche'an	K'iche'	*-oom/-uum*	*-V_1m*	*-oom/-uum*	*-V_1m*
	Achi	*-oom/-uum*	*-m*	*-oom/-uum*	*-m*
	Kaqchikel	*-om/-um ~ -on/-un*	*-m ~ -n*	*-om/-um ~ -on/-un*	*-m ~ -n*
	Tz'utujil	*-oon/-uun*	*-V_1n*	*-oon/-uun*	*-V_1n*
	Sakapultek	***-V_Rm(aj)***	***-m(aj)***	***-V_Rm(aj)***	***-m(aj)***
	Sipakapense	***-maj***	***-maj***	***-maj***	***-maj***
	Poqomam	*-om/-um*	*-m*	*-ooj/-uuj*	***-(a)maj***
	Poqomchi'	*-om ~ -V_Rm*	*-m*	*-ooj/-uuj*, ***-(V_R)maj***	***-maj***
	Uspanteko	*-oom*	*-V_1m*	*-V_Rl, -oom*	*-l*
	Q'eqchi'	*-om*	*-m*	*-b'il*	*-mb'il*
Mamean	Mam	*oo-taq, maa-taq*	*oo-taq, maa-taq*	***-'n(-maj),*** *-na(j), -aj*	***-'n(-maj),*** *-na(j), -aj*
	Teko	*matx, (o)je=tq*	*(o)je=tq*	*-' ~ -m; -o-'n,* ***-maj***, *-naq***	*-' ~ -m; -o-'n,* ***-maj***
	Awakateko	*-naq*	*-naq*	*-ij; -ijt*	*-Vnt*
	Chalchiteko	ND	ND	*-ij*	ND
	Ixil	*-l(a')*	*-l(a')*	*-l(a'), -el*	*-l(a'), -mal*

Table 14: Eastern Mayan transitive perfect morphology.

In addition to the participial uses, Uspanteko has a verbal passive suffix *-maj* that appears in subordinate clauses, and Poqomchi' also has a verbal passive suffix *-mV_Rj~-maj*. Examples of both will be given later.

The distribution of *-maj* within K'iche'an does not conform to the established subgrouping, as shown in Figure 5. (I here use the broad subgrouping of Kaufman 1976a, revised to place Sakapultek and Sipakapense in Kaqchikelan per Du Bois 1981: 34.)

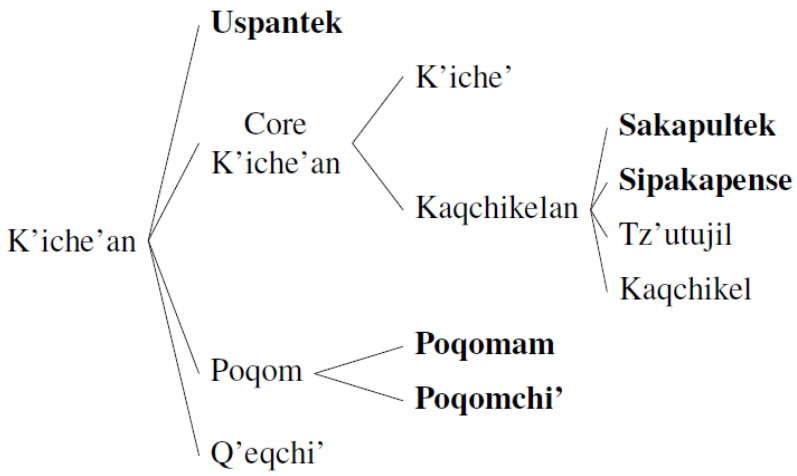

Figure 5: K'iche'an subgrouping. Languages with a reflex of *-maj* are bolded.

Assuming *-maj* to be an innovation, that innovation is not limited to a single subgroup: it affects both Poqom languages, the Kaqchikelan languages Sakapultek and Sipakapense (but not their sister languages Tz'utujil and Kaqchikel), and Uspanteko. The suffix also appears in Northern Mam and Tektiteko, but not Awakateko, Ixil, or Southern Mam. This points either to independent innovation or contact between these sub-branches.

Another logical possibility, which I mention here for sake of argument, is to reconstruct **-maj* to proto-K'iche'an. Under this analysis, some languages lost the *-Vj* component of the suffix and were left with only *-m*. However, this reverse analysis is not a better match for the subgrouping: a *-Vm* perfect suffix without a *-Vj* component appears in K'iche', Tz'utujil, Kaqchikel, Poqom, Mam, Tektiteko, and (if Kaufman's 1976b survey data is accurate) Uspanteko and Q'eqchi' (see Table 8, footnote 4). This analysis would require even more independent innovations and is less consistent with the overall

historical picture, where proto-Mayan can be reconstructed with a perfect suffix **(-o)-'m* in both active and passive contexts (sections 4.3-4.4).

The geographic distribution of *-maj* also supports the idea that it may have been shared through contact. The Eastern Mayan languages with *-maj* are shown on the map in Figure 6. These languages fall along a mostly contiguous east-to-west route.

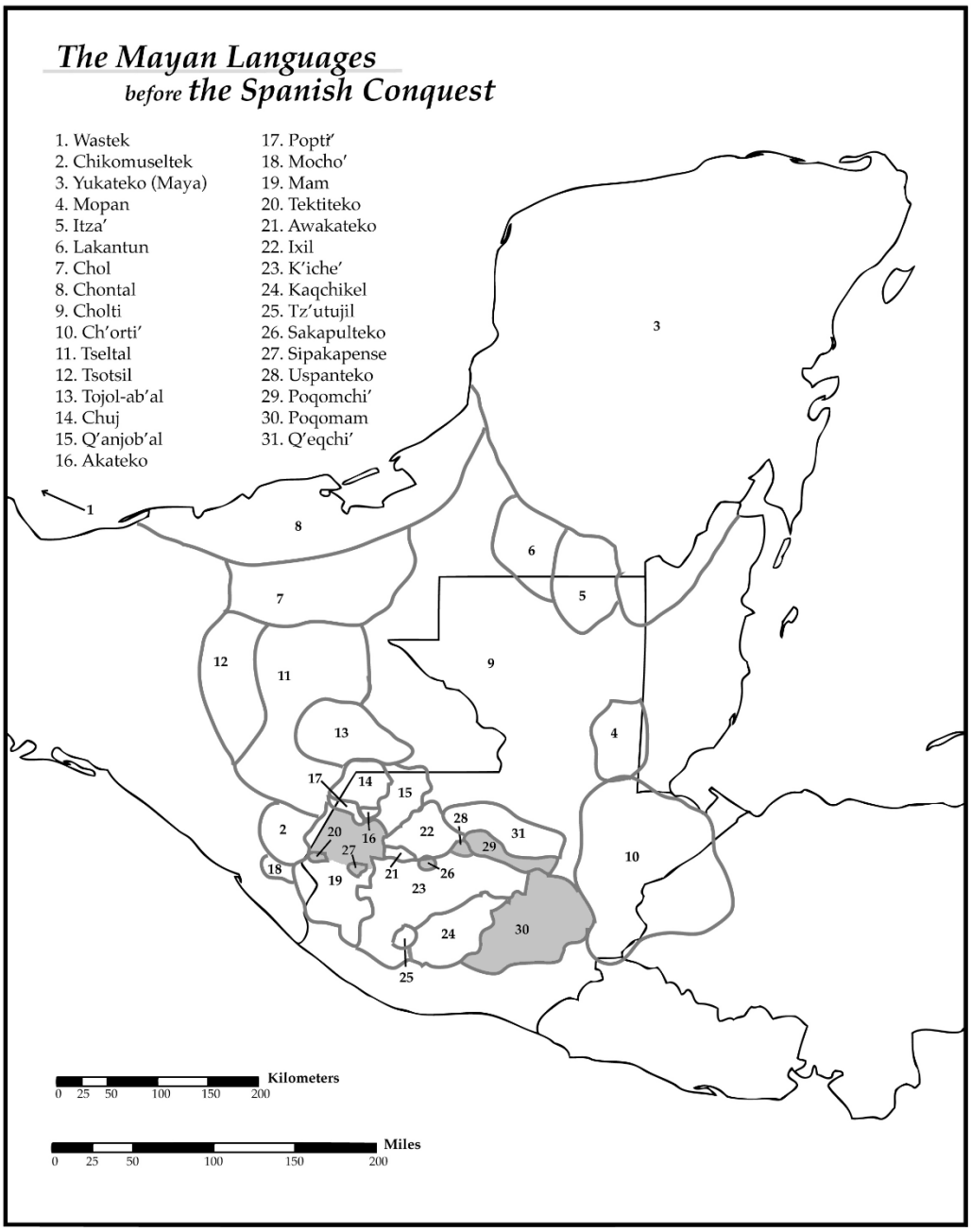

Figure 6: Eastern Mayan languages with *-maj*. Original language map from Law (2014: 23).

Section 5.2 argues that *-maj* originated in the Poqom subgroup. Section 5.3 describes the distribution of *-maj* in each of the languages that borrowed it, and how each outcome differs from the original Poqom suffix. Section 5.4 discusses *-mVj* perfect suffixes in Yucatecan and Teenek and how they are etymologically distinct from Eastern Mayan *-maj*. Section 5.5 discusses other ethnographic and linguistic evidence for language contact in the Sacapulas Corridor, and section 5.6 summarizes.

5.2. ORIGIN OF EASTERN MAYAN *-MAJ*

Poqom is the most likely source of the *-maj* suffix. Unlike in other Eastern Mayan languages, *-maj* in Poqom can be analyzed synchronically as a combination of two suffixes: the *-Vm* perfect suffix and a passive suffix *-aj*. When other Eastern Mayan languages borrowed *-maj* from Poqom, they did not import Poqom's distinction between the *-m* active and *-m-aj* passive perfect forms, obscuring the origin of the suffix.

In modern Poqomam and Poqomchi', *-(V_R)m* is used to express perfect aspect in active voice, with both root and derived transitive verbs (1, 3). The passive perfect participle is normally *-ooj/-uuj* with transitive roots and *-maj* with derived transitive verbs (2a-b, 4). In Poqomchi', *-(V_R)maj* is also productive with transitive roots, often the same roots that take *-ooj/-uuj* (4c-d). I am not sure whether *-ooj/-uuj* and *-(V_R)maj* are completely in free variation with transitive roots in Poqomchi'; my impression is

that *-ooj/-uuj* is much more common in actual usage, but I am unaware of any linguistic or sociolinguistic factors distinguishing them.

POQOMCHI' (Mó Isém 2006: 184-187)

(1) a. *a-toj-**om*** (Active RTV)
A2S-pay-PERF
'you have paid him/her'

b. *hin aw-oq'om-ee-**m*** (Active DTV)
1S.PRO A2S-cure-TV-PERF
'you have cured me'

(2) a. *hin il-**ooj*** (Passive RTV)
1SG.PRO see-PERF.PAS
'I have been seen'

b. *ch'uwa'-r-isa-**maj*** (Passive DTV)
filth-VERS-CAUS-PERF.PAS
'(has been) made filthy'

c. *toj-**ooj*** (Passive RTV)
pay-PERF.PAS
'(has been) paid'

d. *hin toj-**omaj*** (Passive RTV)
1S.PRO pay-PERF.PAS
'I have been paid'

POQOMAM (Santos Nicolás and Benito Pérez 1998: 185; Benito Pérez 2007: 37-38)

(3) a. *hat ru-chap-**am***
2S.PRO A3S-grab-PERF
'he/she has grabbed you'

b. *hat ki-tin-saa-**m***
2S.PRO A3P-bathe-CAUS-PERF
'they have bathed you'

(4) a. *chap-**ooj***
grab-PERF.PAS
'(has been) grabbed'

b. *tiin-sa-**maj***
bathe-CAUS-PERF.PAS
‘(has been) bathed’

The contrast between *-(V$_R$)m* as the active perfect and *-(V$_R$)maj* as the passive perfect strongly suggests that *-(V$_R$)maj* is actually a combination of two suffixes, *-(V$_R$)m* and *-aj*. *-(V$_R$)m* carries the basic ‘perfect’ meaning common to both the active and passive forms, while *-aj* signals passive voice. I suggest that this is the original diachronic origin of *-maj:* while proto-K’iche’an and some of its descendants (K’iche’, Kaqchikel, and Tz’utujil) continue to use an identical perfect suffix in both active and passive voice, proto-Poqom recruited the *-aj* passive suffix to distinguish the two forms.

Supporting this analysis, an *-(a)j* passive or intransitivizing suffix appears elsewhere in Mayan languages (Kaufman 2015: 328); I here show reflexes from Poqom and other K’iche’an languages. In Poqom, the *-j* passive suffix generally occurs with derived transitive verbs (5a, 6) and less commonly with transitive roots (5b). A homophonous ‘versive’ suffix derives intransitive verbs from adjectives (5c).

POQOMCHI’ (Mó Isém 2007b: 68, 74)

(5) a. *x-kam-s-**j**-ik*
COM-die-CAUS-PAS-IV
‘s/he was killed’

b. *x-tz’ub’-**j**-ik*
COM-kiss-PAS-IV
‘s/he was kissed’

c. *kow-**j**-ik*
hard-VERS-IV
'it was hardened'

POQOMAM (Benito Pérez 2007: 70)

(6) *x-tiin-sa-**j**-a*
COM-bathe-CAUS-PAS-IV
's/he was bathed'

Core K'iche'an languages and Poqomam have a *-(V)taj* passive suffix (*-(V)täj* in Kaqchikel), typically labeled the "completive passive."

K'ICHE' (López Ixcoy and Sis Iboy 2007: 76)

(7) *X-loq'-**otaj*** *ri wuuj* *r-umaal* *ri ak'aal.*
COM-buy-PAS.COM DET book A3S-RN.by DET boy
'The book was bought by the boy.'

KAQCHIKEL (García Matzar 2007: 73)

(8) *X-loq'-**otäj*** *ri wuj* *r-uma* *ri ak'wal.*
COM-buy-PAS.COM DET book A3S-RN.by DET boy
'The book was bought by the boy.'

POQOMAM (Benito Pérez 2007: 72)

(9) *La imul* *x-chap-**taj**-a* *r-u'uum* *la tz'e'.*
DET rabbit COM-grab-PAS-IV A3S-RN.by DET dog
'The rabbit was caught by the dog.'

Kaufman treats *-(V)taj* as a combination of the **-t* 'bounded passive' with the intransitivizing suffix **-aj* that he glosses 'mediopassive' (Kaufman 2015: 328-329). The *-saj* passive suffix of Uspanteko likely also contains a reflex of **-aj*:

USPANTEKO (Can Pixabaj 2007: 178)
(10) *x-Ø-tij-**sáj**-ik*
COM-B3S-eat-PAS-IV.SUF
'It was eaten'

The upshot of this is that *-aj* is ubiquitous in the K'iche'an subgroup, including Poqom, and could have served as a plausible source for *-(V_R)m-aj*. Even though this suffix has been reduced to just *-j* in modern Poqom, the original form of the suffix is **-aj* as seen in other K'iche'an languages.

In Poqomam, the alternation between *-m* and *-m-aj* is preserved only with DTVs. RTVs exclusively use *-ooj/-uuj* as the passive perfect participle. However, as discussed at length in chapter 6, *-ooj/-uuj* is most likely an innovation in Poqom; in other K'iche'an languages, it functions as an action nominalization for transitive roots. I suggest that proto-Poqom recruited *-ooj/-uuj* after the innovation of *-maj*, obscuring the parallel between the active and passive perfect forms of RTVs. The full sequence of events would have been as shown in Table 15. Note that in this table, for visual simplicity and to avoid redundancy, I have not shown the regular vowel harmony pattern where *-o(o)m* or *-ooj* will become *-u(u)m* or *-uuj* after a root vowel /u/; this rule is active at every attested and reconstructed stage shown here.

Stage	Active		Passive	
	RTV	DTV	RTV	DTV
Proto-EM	*-*o'm*	*-*'m*	*-*o'm*	*-*'m*
Proto-K'iche'an	*-*oom*	*-*V_1m*	*-*oom*	*-*V_1m*
Proto-Poqom 1	*-*om*	*-*m*	*-*om-**aj***	*-*m-**aj***
Proto-Poqom 2	*-*om*	*-*m*	***-ooj,** *-om-aj*	*-*m-aj*
Poqomam	*-om*	*-m*	*-ooj*	*-(a)maj*
Poqomchi'	*-om ~ -*V_Rm*	*-m*	*-ooj, -*$V_R$maj*	*-maj*

Table 15: Diachrony of the perfect paradigm from Proto-Eastern Mayan to Poqomam and Poqomchi', showing the innovation of *-maj*. Boldface indicates the recruitment of a new suffix.

Kaufman suggests an alternative origin for *-maj*. In his analysis, the *-aj* portion of *-maj* derives from a proto-Mayan adverb **(a)j* 'earlier, before', which survives as an aspect proclitic *j=* in Chuj, Mocho', Awakatek, and Yucatec, and as the completive suffix *-aj* in Yucatecan languages (Kaufman 2015: 195, 200). This analysis is probably valid for *-maj* in Yucatecan (see discussion in section 5.4 below), but does not account for the active/passive alternation seen in Poqom which shows Eastern Mayan *-aj* to be from a passive suffix. Additionally, this analysis does not explain the geographic distribution of the suffix or its distribution across multiple branches of the K'iche'an family.

5.3. OUTCOMES OF CONTACT

In the other Eastern Mayan languages, *-maj* appears freely with RTVs and DTVs, whereas in modern Poqomam and Poqomchi', *-ooj/-uuj* is the default passive perfect

participle suffix for RTVs. Based on this fact, I suggest that the *-maj* suffix diffused from the stage labeled as "Proto-Poqom 1" in Table 15: before *-ooj/-uuj* was recruited, when *-maj* would have been fully productive with both RTVs and DTVs.

Poqomam and Poqomchi' are the only languages to show a clear synchronic alternation between active *-m* and passive *-maj*, which is strong evidence that Poqom was the origin. Other languages lack this alternation: Mam and Teko lack the active perfect form altogether, while Sakapulteko and Sipakapense use *-maj* in both active and passive voice. I here show the outcomes of the diffusion of *-maj* into Uspanteko, Sakapultek/Sipakapense, and Northern Mam.

5.3.1. Completive passive in Uspanteko

Uspanteko has *-maj* not as a participle, but as a verbal passive suffix (the "completive passive" per Can Pixabaj 2007: 177). Verbs derived in *-maj* occur with the intransitive category suffix *-ik* and with completive aspect prefixes, showing that they are fully verbal predicates. *-maj* appears only when coordinated with other clauses (11-12), contrasting with the general passive *-saj* which can stand alone (10 above). From the translations below, *-maj* is generally used to refer to an event that happened prior to the action of the verb it is coordinated with.

USPANTEKO (Can Pixabaj 2007: 179)

(11)	*X-Ø-tz'aj-**máj**-ik*	*aruk'*	*re'*	*x-Ø-Ø-k'ut*	*taq chú-wch.*
	COM-B3S-paint-PAS-IV.SUF	PART	PART	COM-B3S-A3S-teach	P PREP-REL.N
	'After being painted, they taught him.'				

(12) *X-Ø-tij-**máj**-ik* *aruk'* *re'* *x-Ø-e'-k.*
COM-B3S-eat-PAS-IV.SUF PART PART COM-A3S-go-IV.SUF
'After eating it (lit. after it was eaten) he left.'

The fact that *-maj* carries this sense of temporal dependence, marking a prior event, is consistent with the idea that it originated as a marker of perfect aspect. In turn, the fact that the suffix became a passive marker in Uspanteko is consistent with my claim that the *-maj* perfect was specifically limited to passive contexts (as in Poqom) and did not appear in active voice (as in Sakapultek and Sipakapense).

The modern Uspanteko perfect participle suffix is *-(V_R)l*, which is innovative within K'iche'an. I suggest the following progression in Uspanteko: First, Uspanteko borrowed *-maj* from Poqomchi' as the passive perfect participle. Second, *-maj* gained the function of a verbal passive marker, possibly paralleling a similar extension in Poqomchi' (see below). Last, *-(V_R)l* replaced *-maj* as the perfect participle but left the verbal passive *-maj* untouched. (For the origin of the *-(V_R)l* participle, see section 4.2.4.3.)

Poqomchi' also has a verbal passive suffix *-mV_Rj ~ -maj*, occurring exclusively with RTVs, which is synchronically distinct from the perfect participle (Mó Isém 2006: 222; Brown 1979: 162). As in Uspanteko, this occurs with the *-ik* intransitive category suffix, showing it to be verbal; however, it does not show up with an overt aspect prefix. Further, this passive can occur in monoclausal sentences and is not limited to marking prior events in coordinated clauses as in Uspanteko.

WESTERN POQOMCHI' (Mó Isém 2006: 222)

(13) *Ø-Ø-Tz'aj-**maj**-ik* *wach* *i* *uuj.*
COM-B3S-wash-PAS-IV.SUF face DET nixtamal
'The *nixtamal* was washed.'

(14) *Re'* *aw-ak'uun* *Ø-Ø-k'ux-**muj**-ik* *r-uum* *taqe* *k'ohlox.*
DET A2S-son COM-B3S-eat-PAS-IV.SUF A3S-RN.by PL wasp
'Your son was stung by the wasps.'

This passive suffix normally harmonizes with the root but can show up as *-maj* on the root *ch'ey-* 'hit' (Mó Isém 2006: 222), showing that *-maj* is the underlying form. The form of the suffix, as well as the fact that it does not occur with aspect proclitics like most verbal bases, suggests that this suffix originated in the deverbal *-maj* passive perfect participle, just as I have suggested for Uspanteko. It is possible that the extension of the *-maj* perfect participle into a verbal passive marker happened in parallel in Poqomchi' and Uspanteko (perhaps as a wave innovation). Alternately, it is also possible that the extension happened in Poqomchi' first, and that Uspanteko borrowed *-maj* simultaneously as a participle and as a passive suffix.

Looking only at Poqomchi' and Uspanteko, it is tempting to suggest that Uspanteko borrowed *-maj* only as a verbal passive suffix, not as a participle, because the suffix in modern Uspanteko lacks the participial function. However, the languages to the west of Uspanteko (Sakapultek, Sipakapense, Northern Mam, and Teko) all use *-maj* as a participle. Assuming that the suffix was borrowed from language to language along the Sacapulas Corridor, so that Uspanteko was an intermediary between Poqom and the rest, Uspanteko would have to have had the suffix as a perfect participle at one point. Nevertheless, one could challenge this assumption and still maintain that the suffix

diffused by contact, as the ethnographic evidence (section 5.5.1) shows that speakers of Poqom were in direct contact with speakers of Sakapulteko as well as Uspanteko before the colonial period.

5.3.2. Extension to active voice in Sakapulteko/Sipakapense

Unlike other Eastern Mayan languages, Sakapulteko and Sipakapense use *-maj* in both active and passive voice. This deserves explanation given my claim that **-(o)maj* originated specifically as the passive perfect participle. I propose two possible explanations. In Scenario 1, **-(o)maj* was borrowed as a passive perfect participle and then extended to active voice. In the second scenario, the form **-(o)maj* was borrowed as a general marker of perfect aspect, replacing the existing Core K'iche'an perfect **-(oo)m* which appeared in both active and passive contexts. Scenario 2 is reminiscent of Heath's (1998) "hermit crabs," a type of formal renewal where the affix marking a given category is spontaneously replaced by a phonologically heavier morpheme to make the category more salient. In either scenario, the *-aj* portion of **-(o)maj* was bleached of the passive meaning it originally contributed.

Note that in modern Sakapultek, phrase-final *-(V_R)maj* varies with phrase-medial *-(V_R)m,* but this alternation is based on position within the phrase rather than any difference in voice. Sipakapense, by contrast, uses the full form *-maj* regardless of syntactic position. It is common for suffixes in Mayan languages to have different phrase-final and phrase-medial forms: for example, in K'iche', the intransitive category suffix

("plain status") is *-ik* phrase-finally and disappears phrase-medially, while the intransitive "dependent status" suffix is *-oq* phrase-finally and *-a* phrase-medially (Larsen 1988: 179). The fact that Sakapultek and Sipakapense use *-maj* in both active and passive contexts, unlike all other Eastern Mayan languages, suggests that they borrowed the suffix when they were still a single speech community, before their separation (see the ethnographic discussion in section 5.5.1 below). However, they exhibit this difference in the phrase-medial behavior of the suffix, and there is no direct evidence for which language is more like proto-Sakapultek-Sipakapense. This unanswered question adds an extra layer of nuance to the two borrowing scenarios I discuss here.

Scenario 1 is straightforward: **-(o)maj* in proto-Poqom was used in passive contexts. Sakapultek-Sipakapense (before their separation) originally borrowed **-(o)maj* as a passive perfect participle but extended it to active voice. At some point after the borrowing occurred, Sakapultek speakers reinterpreted the *-(o)m/-(o)maj* allomorphy as a phrase-medial/phrase-final contrast rather than a voice contrast. This progression is shown in Table 16.

Stage	Active		Passive	
	RTV	DTV	RTV	DTV
Proto-Core K'iche'an	**-oom*	**-V_1m*	**-oom*	**-V_1m*
Proto-Sak/Sip 1	**-om*	**-m*	****-omaj***	****-maj***
Proto-Sak/Sip 2	****-omaj***	****-maj***	**-omaj*	**-maj*
Sakapultek	*-V_Rm(aj)*	*-m(aj)*	*-V_Rm(aj)*	*-m(aj)*
Sipakapense	*-maj*	*-maj*	*-maj*	*-maj*

Table 16: Scenario 1: Sakapultek and Sipakapense borrow **-(o)maj* as a passive participle and extend it to active voice. Boldface indicates replacement of a previous suffix.

Scenario 2 is based on the observation that in proto-Core K'iche'an, the immediate ancestor of Sakapultek and Sipakapense, the same perfect suffix is used in active and passive contexts, a situation retained from proto-Eastern Mayan and (as I argue in this chapter) proto-Mayan. Only person marking distinguishes active and passive perfect forms: active forms agree with both the agent and the patient, while passive forms agree only with the patient.

When Sakapultek and Sipakapense borrowed **-(o)maj*, they may have simply borrowed it as "the perfect," without the passive voice feature that it carried in Poqom. This could happen if Sakapultek-Sipakapense speakers identified Poqom **-(o)maj* as having the same function as their inherited form **-(oo)m*, and substituted **-(o)maj* wholesale in any context where **-(oo)m* had formerly appeared. This is an example of "matter replication" without "pattern replication" in the terms of Matras and Sakel (2007); Sakapultek-Sipakapense copied the form of the Poqom suffix but not the pattern

of where it was used. As mentioned above, this could be seen as an example of a "hermit crab" process per Heath (1998); **-(oo)m* was replaced by the similar-sounding but phonologically heavier **-(o)maj*, perhaps to make the participle more salient. (See section 4.4.7 for more theoretical discussion of direct affix borrowing in the context of the Lowland *-b'il* perfect participle.)

	Active		Passive	
Stage	RTV	DTV	RTV	DTV
Proto-Core K'iche'an	**-oom*	**-V_1m*	**-oom*	**-V_1m*
Proto-Sak/Sip	****-omaj***	****-maj***	****-omaj***	****-maj***
Sakapultek	*-V_Rm(aj)*	*-m(aj)*	*-V_Rm(aj)*	*-m(aj)*
Sipakapense	*-maj*	*-maj*	*-maj*	*-maj*

Table 17: Scenario 2: Sakapultek and Sipakapense borrow **-(o)maj*, replacing **-(oo)m* in all contexts.

Note that in Scenario 2 I have assumed proto-Sakapultek-Sipakapense was more like Sipakapense, which has *-maj* with no variation. If proto-Sakapultek-Sipakapense was more like Sakapultek, where *-(V_R)maj* appears only phrase-finally, Scenario 2 still works but must be nuanced slightly. Rather than replacing **-(oo)m* across the board, **-(o)maj* replaced **-(oo)m* as the perfect only in phrase-final position. This is still an example of matter replication without pattern replication, because while proto-Sakapultek-

Sipakapense borrowed the form *-*omaj*, the active/passive split between Poqom *-*om* and *-*omaj* was instead reinterpreted as a phrase-medial/phrase-final alternation.[40]

5.3.3. Multiple exponence in Mam and Tektiteko

Most varieties of Mam use -*'n* as the passive perfect participle (England 1983: 124), a descendant of **(-o)-'m.* In Northern Mam, -*'n* occurs in variation with a longer form -*(')n-maj*. -*maj* only ever occurs with the perfect participle -*'n* and does not change the meaning; according to England, its function is to "give emphasis" to the participle (1983: 128-129).

MAM (NORTHERN) (England 1983: 129)

(15) a. *aq'n-a-**'n(-maj)***
work-TH.V-PERF(-PERF)
'worked'

b. *sb'iit'-a-**n(-maj)***
rip-TH.V-PERF(-PERF)
'ripped'

This situation qualifies as an example of "reinforcement multiple exponence" in the terms of Harris (2017: 55): where a word carries two affixes that express the same set of features.

[40] While I was unable to explore this question further here, a corpus study of both Sakapultek and Poqom could examine the correlation between voice and phrasal position. If active perfect forms are more likely to appear in phrase-medial position, while passive perfect forms are more likely to appear phrase-finally, then this could account for why Sakapultek-Sipakapense reinterpreted the voice distinction as one of position.

Harris notes that reinforcement multiple exponence can arise through borrowing, when "languages supplement the markers they already have with markers for the same grammatical categories from a contact language" (Harris 2017: 165). This appears to be exactly what happened in Northern Mam varieties, which borrowed *-maj* from a K'iche'an language to supplement their existing perfect participle *-'n,* possibly to make it more phonologically salient, and possibly to resolve ambiguity (because *-'n* is also used in infinitival contexts; see England 1983: 125, discussed in section 4.2.1.1). What makes this situation especially interesting is that both suffixes are cognate—an inherited and a borrowed reflex of proto-Eastern Mayan **(-o)-'m.*

In Teko, closely related to Mam, the inherited proto-Mamean **-o-'m* perfect participle suffix has been reduced to *-'* with a 3rd person singular subject or *-m* otherwise (Stevenson 1987: 97).[41] Pérez Vail (2007) refers to *-'* as the "passive participle," contrasting with *-maj* "preterite participle" and *-naq* "perfect participle"; the author notes that both *-'* and *-maj* refer to the patient of an action and are highly productive, but *-'* entails the existence of an agent (which may occur in an oblique phrase headed by *tzan* 'by', as in 16) while *-maj* does not (Pérez Vail 2007: 158-159).

TEKTITEKO (Pérez Vail 2007: 159)

(16)	*k'alo-'-Ø*	*tzan*	*te*	*xjaal*
	tie-PTCP-B3S	by	DET	person
	'It is tied up by the person.'			

[41] The ALMG descriptive grammar of Tektiteko lists *-V'~-on* as just a passive suffix (CLT 2001: 125), but from the few examples they give, this seems to be the same as the *-'~-m* passive perfect construction shown in Stevenson (1987). Some (but not all) varieties of Tektiteko must have undergone the word-final **m>n* change discussed in section 4.2.1.2, explaining the variation between *-m* and *-on.*

Unlike Northern Mam, *-maj* attaches directly to the stem vowel in most cases (17-18). In only one example, *-maj* seems to stack with the inherited *-'* participle as in Northern Mam (19), if this glottal stop is in fact the participle and not part of the stem or some other affix.[42]

TEKTITEKO (Méndez Pérez and López López 2018: 9, 138, 184, my glosses)

(17) *Ajla-**maj*** *kye* *t-al* *kxhlan*
count-PERF DET A3S-child chicken
'The baby chicks are counted.'

(18) *Tiqo-**maj*** *t-iqatz* *te* *kway* *t-k'uj-witz*
push-PERF A3S-load DET horse A3S-stomach-mountain
'The horse's load has been pushed over the edge of the road.'

(19) *Poqo-**'-maj*** *t-i'j* *te* *sub'an tzan* *te* *n-ya'*
burn-PERF-PERF A3S-outside DET tamal PREP by A1S-aunt
'The tamales were burned by my aunt.'

As shown by the above, Teko seems to use inherited *-'* and borrowed *-maj* for distinct functions and does not normally stack the two suffixes as in Northern Mam, though (19) is an exception where multiple exponence occurs.

5.4. *-MAJ* OUTSIDE OF EASTERN MAYAN

In this chapter, I have argued that Eastern Mayan *-maj* originated in Poqom and spread to other Eastern Mayan languages by contact. This analysis does not account for Yucatecan

[42] Given Pérez Vail's observation that *-'* entails an agent while *-maj* does not, this could account for why *-'* appears in (19), which contains an agent in an oblique phrase.

languages and Teenek, which use the similar suffixes *-maj* and *-aamej* in perfect constructions. Whereas Eastern Mayan *-maj* was created from a combination of the **(-o)-'m* perfect with an **-aj* passive suffix, the Yucatecan and Teenek suffixes probably combined **(-o)-'m* with the adverb **aj* that indicates completive aspect.

Yucatec and Itzaj use *-maj* (phonetically [-mah]) to mark perfect aspect not in passive voice, but only in active voice, as shown in (20). Lacandon uses *-man* or *-män*, a contraction of *-maj-a'an*, as discussed below. Colonial Yucatec sources have examples of only <-ma>, though Bricker implies that the colonial suffix ended in an (untranscribed) laryngeal fricative which led to modern [-mah] (Bricker 2019: 75-77).

YUCATEC, ITZAJ (Hofling 2017: 710)

(20) a. *aw-il-**m-aj**-en*
A2-see-PERF-COM-B1S
'you have seen me'

b. *aw-il-**m-aj**-Ø*
A2-see-PERF-COM-B3S
'you have seen her/him/it'

Hofling usually glosses *-m-aj* as a combination of *-m* 'perfect' with *-aj*, a marker of "completive status" (Hofling with Tesucún 2000: 55; 2006: 376). Kaufman's most recent working paper agrees with this analysis (Kaufman 2015: 429). Outside of perfect contexts, *-aj* in Itzaj marks completive aspect on transitive and (optionally) intransitive verbs, and can co-occur with the completive aspect prefix *t-* when used with transitive verbs (Hofling with Tesucún 2000: 367).

However, Hofling notes that in Itzaj, *-m-aj* may optionally appear with the "antipassive completive participle" which takes a separate *-aj* completive suffix (21).

ITZAJ (Hofling with Tesucún 2000: 169)
(21) *b'o'ol(-**m-aj**[43])-n-**aj**-a'an*
pay(-PERF-COM)-AP-COM-PTCP
'has paid, has been a paymaster'

If *-m-aj* is a combination of *-m* 'perfect' and *-aj* 'completive', then (21) contains two seemingly redundant *-aj* completive suffixes. Hofling takes this as evidence that the *-aj* portion of *-maj* may not in fact be the completive suffix; it could be a detransitivizing *-aj* suffix (cognate with the *-aj* passive suffix of K'iche'an), or *-maj* may in fact be unanalyzable (Hofling with Tesucún 2000: 398fn3). I do not see redundancy of the completive as a problem for Hofling's original analysis; perhaps one *-aj* completive suffix is fossilized as part of *-maj* while the other *-aj* is used compositionally.

Schumann Gálvez treats the *-aj* suffix in Itzaj *-maj* as a marker of a "distal patient" (2000: 118, my translation). By this term, he seems to mean the same suffix that Hofling references, the *-aj* suffix that appears with verbs in completive aspect (Schumann Gálvez 2000: 116).

As mentioned above, the *-maj* perfect suffix occasionally co-occurs with the *t-* completive aspect prefix. Hofling does not offer an explanation for this fact, but it is consistent with the observation that Yucatecan languages are very free about combining

[43] Hofling glosses *-maj* as a single 'perfect' suffix in this example; I have separated it to show the redundancy of *-aj*.

completive and perfect aspect marking, as he proposed for *-m-aj* itself. Any semantic consequences of this are beyond the scope of this dissertation.

ITZAJ (Hofling with Tesucún 2000: 370)

(22) *I* *a'* *b'a'alche'-ej* *a'-ka'* *jo'm-ij* *u-laj=jan-t-ik*
and DET animal-TOP DET-when end-B3S A3-all=eat-TV-IV
a' *ch'iich'* ***t*-u-*tz'on*-*m*-*aj*-*oo'*** *la'ayti-oo'-e …*
DET bird COM-A3-shoot-PERF-COM-PL 3.PRO-PL-TOP
ka' *kap-ij* *ti* *siit' …*
then begin-B3S SUB jump
'And the animal, when it finished eating all the birds that they themselves had shot, then it began to jump.'

Lacandon uses a perfect suffix *-man ~ -män* instead of *-maj*. Hofling relates this to Itzaj forms that combine the *-m-aj* perfect with the *-a'an* participle, implying that Lacandon shortened the string of suffixes (Hofling 2006: 376). As the Lacandon form is unique within Yucatecan and Hofling has proposed a plausible origin, I will not discuss it further here.

SOUTHERN LACANDON (Hofling 2017: 710)

(23) *aw-il-****män****-Ø*
A2-see-PERF-B3S
'you have seen her/him/it'

ITZAJ (Hofling with Tesucún 2000: 170)

(24) *litz-****m-aj-a'an***
fish-PERF-COM-PTCP
'has been a fisher, has fished'

In Teenek, the perfect suffix *-aam* invariably occurs with another suffix to mark its voice: *-aam-al* active, *-aam-ej* passive, and *-aam-ath* antipassive (Kondić 2012: 114).[44] This situation is unique to Teenek—no other language has a cognate of *-aam-al* or *-aam-ath*—suggesting that the addition of the suffix in *-aam-ej* may similarly be a Teenek innovation, despite its superficial similarity to *-maj* in Eastern Mayan and Yucatecan. (Note that I am not saying the passive use of *-aam* itself is an innovation, merely the addition of *-ej*. In section 4.4, I presented a case that the use of a *-Vm* passive perfect suffix is a proto-Mayan retention.)

Teenek has two *-Vj* suffixes with a related meaning: *-ej* marks completive aspect of intransitive verbs, while *-aaj* marks passive voice on transitive verbs in completive aspect (Kondić 2012: 95). *-ej* is the more likely source for *-aam-ej* due to the similarity in form, but in either case, the suffix has a strong association with completive aspect as in Yucatecan.

5.5. THE SACAPULAS CORRIDOR

The above discussion presents strong evidence for the east-to-west diffusion of *-maj* through Mayan languages of highland Guatemala, a zone that I term the "Sacapulas Corridor." The Sacapulas Corridor ranges from Alta Verapaz, the region of east central Guatemala where Poqomchi' is spoken, to Tectitán in western Guatemala where

[44] The forms given here are from the South Eastern variety of Teenek. In the Potosí variety, the passive perfect is reduced to *-aame* (Edmonson 1988: 614).

Tektiteko is spoken. While no previous study has identified this full contact area, ethnographic and linguistic sources provide evidence of contact between neighboring groups along this route. In light of this evidence, I propose further research on the extent of lexical and grammatical borrowing through the Sacapulas Corridor.

5.5.1. Ethnographic support for the Sacapulas Corridor

Ethnographic sources support the idea of contact between speakers of Poqom and their neighbors to the west, which could have resulted in direct affix borrowing of *-maj*. Sacapulas, the home of Sakapulteko, has a major salt deposit which was a locus of trade both before and after the Spanish conquest (Du Bois 1981: 11-15). In fact, Hill and Monaghan cite Dominican colonial sources saying that "men regularly traveled west to Sacapulas from the Verapaz region to work at salt making" (Hill and Monaghan 1987: 5, citing Viana et al. 1955[1574]: 55). Verapaz is the region where Poqomchi' is spoken, where the Dominican author Viana worked extensively. In the modern day, there is a major highway (7W) that leads straight from San Cristóbal Verapaz through Uspantán and Sacapulas to Hueuhetenango in the Northern Mam area; it is entirely plausible that this highway follows the older trade route.

In addition to the salt trade, there seem to have been political connections among K'iche'an and Mamean groups of the northern highlands. In 1529, after the K'iche' and Kaqchikel kingdoms fell, the Spanish tried to conquer Uspantán and were soundly defeated (Lovell 2015: 66). The next year, they returned to Uspantán and found an

alliance of warriors from Uspantán (Uspanteko[45]), Cunén (K'iche', Cunenteco), Cotzal (Ixil), Sacapulas (Sakapultek), and Verapaz (Poqomchi' or Q'eqchi'[46]). Their combined army outnumbered the Spanish but ultimately lost the battle (Fuentes y Guzmán [1690-99] 1969-1972, vol. 3: 21, cited in Lovell 2015: 67). The fact that the Uspantekos were able to raise an army from multiple ethnically distinct towns in a 30-mile radius within one year suggests that they may have drawn upon existing alliances or at least social ties between these communities.

The above sources support connections between the Poqomchi', Uspanteko, and Sakapulteko communities around the time of the conquest. Oral history suggests that the Sipakapense originally lived in the environs of Sacapulas, but broke with the Sakapultekos a few centuries before the conquest and moved to what is now Sipacapa, in the Mam region (Ambrosio Zacinto 1995, cited in Barrett 1999: 12). Since then, Sipakapense has been in intense contact with Mam (and later K'iche') (Barrett 1996 *passim*; Barrett 1999: 13-15). Given the similarities in how Sakapulteko and Sipakapense use *-maj*, they likely borrowed the suffix before the two communities separated, important for relative timing of the contact event.

I am unaware of ethnographic sources specifically tying Northern Mam communities or Tectitán (the home of Tektiteko) to the Sacapulas Corridor. However,

[45] Fuentes y Guzmán only refers to the warriors' place of origin, not their ethnic identification or linguistic background. I have added the names of the languages most prominently represented at each town for reference.

[46] Verapaz is the Spanish name of two Poqomchi'-speaking towns (San Cristóbal Verapaz, Santa Cruz Verapaz) and of the wider region that includes those towns (the modern-day departments of Alta Verapaz and Baja Verapaz), which also includes speakers of Q'eqchi' and Achi (K'iche'). Given that the other places on his list are all names of towns, and in combination with the linguistic evidence, I believe Fuentes y Guzmán is referring specifically to the Poqomchi'.

given the economic importance of the Sacapulas salt flats and its geographic proximity of Sacapulas to the Mam area, contact between these communities is fully plausible. In turn, Tectitán is well within the Mam area; a modern highway leads directly from Tectitán to San Idelfonso Ixtahuacán and the other cities where Northern Mam varieties with *-maj* are spoken.

5.5.2. Other linguistic support for the Sacapulas Corridor

Other linguistic features are shared among languages of the Sacapulas Corridor, though none as wide-ranging as *-maj*.

Campbell (1977) notes several shared features between Poqom and Uspanteko which are not shared by other K'iche'an languages. Both languages express 2nd person plural by combining the 2nd person singular agreement marker with a plural postclitic, instead of having a distinct person marker for 2nd person plural. The existential predicate (Campbell: "copula") is *wi-* in Poqom and Uspanteko, contrasting with *wan* in Q'eqchi' and *k'o(h(l))* in Core K'iche'an languages. Campbell is agnostic as to whether these features result from shared retention, shared innovation, mutual contact, or (in the case of 2nd person plural markers) independent borrowing from a non-K'iche'an source such as a Ch'olan-Tseltalan language (Campbell 1977: 71-72).[47]

[47] Campbell (1977: 71-72) additionally mentions in Poqom, Uspanteko, and (sometimes) Q'eqchi', positional stems take suffixes for Set B person agreement, rather than prefixes as in other K'iche'an languages. Law (2014: 91-92) argues that this behavior of Set B markers is a retention, rather than a shared innovation.

Preliminary research suggests contact between Uspanteko and Cunenteco (also called Cunén K'iche'), a K'iche'an variety spoken in the town of Cunén, which is located between Uspantán and Sacapulas along the modern highway 7W. Most previous work has considered Cunenteco an innovative dialect of K'iche' (Campbell 1977, Par Sapón and Can Pixabaj 2000), but more recent work by Perry Wong (p.c.) suggests that it is a distinct K'iche'an variety that shares features with K'iche', Kaqchikelan, and Uspanteko. In particular, Uspanteko and Cunenteco both innovated lexical tone (Henderson et al. 2022, citing personal communication with Perry Wong). While Cunenteco provides evidence for contact along the Sacapulas Corridor, note that Cunenteco itself lacks *-maj* and instead has *-oom/-uum/-m* as the transitive perfect suffix like K'iche' (Par Sapón and Can Pixabaj 2000: 120).

Additionally, as mentioned above, Barrett (1996) describes three stages of contact affecting Sipakapense: influence from proto-Ixilan on Sakapultek-Sipakapense before their separation, heavy influence from Mam on Sipakapense after it came to its present location, and more recent contact with K'iche'.

As with the ethnographic evidence, most of the linguistic evidence has to do with contact between languages at the eastern end of the Sacapulas Corridor. None of the features mentioned here is as widespread as *-maj*, which spread from the Poqom area in eastern Guatemala to at least five other language communities, including Tektiteko in western Guatemala. Future research may identify other lexical or grammatical borrowing that has taken place among these languages.

5.6. SUMMARY

This chapter has argued that the participial suffix *-maj* originated in the Poqom subgroup as a combination of the proto-Mayan **-o-'m* perfect with an **-aj* passive suffix. *-maj* then diffused westward to other Eastern Mayan languages along a known trade route. I have demonstrated that there is some ethnographic and linguistic support for this contact zone, which I call the "Sacapulas Corridor," and suggest that future work may find other examples of areal diffusion along this route. The *-mVj* perfect suffixes found in Yucatecan and Teenek are not cognate with Eastern Mayan *-maj* and have a distinct origin: a combination of **-o-'m* with an *-aj* or *-ej* completive aspect suffix.

Chapter 6: Diachrony of *-ooj/-uuj*

6.1. INTRODUCTION

This chapter discusses a derivational suffix *-ooj/-uuj* that appears with transitive roots in Mayan languages. Cognates of this suffix mark active perfect constructions in Tseltal, Tsotsil, and Tojol-ab'al, and create passive perfect participles in Poqomam and Poqomchi', so that the suffix interacts with the history of perfect marking. However, many other Mayan languages use *-ooj/-uuj* as an infinitival suffix, suggesting that the function of the suffix has changed over time. In this chapter, I analyze these cognates in detail to determine the original function and distribution of the suffix, how it changed over time, and how it intersects with the paradigm of perfect marking in Mayan languages. As opposed to the previous three chapters, which focused primarily on the base attachment of each participial suffix, this chapter approaches argument structure, syntactic behavior, and other more detailed contexts of use of *-ooj/-uuj* cognates. Only by describing the behavior of this construction in detail is it possible to understand how it fits into the larger grammatical system.

In most languages, the *-ooj/-uuj* infinitive behaves like a nominal form in that it often appears in the same syntactic frame as a lexical noun. However, it retains some of the argument structure of its base verb in that it can accept an object. This dual syntactic behavior of *-ooj/-uuj* is a defining characteristic of what Haspelmath (1996) terms "word-class-changing inflection," which includes participles (deverbal adjectives), converbs

(deverbal adverbs), and masdars (deverbal nouns). In discussing both aspects of *-ooj/-uuj*, I make use of Haspelmath's (1996) distinction between "external syntax," the form's behavior with respect to the larger constituents that contain it and select for it, and "internal syntax" or argument structure, the form's relationship to the constituents that are dependent on it.

6.1.1. Summary of the problem

Many Mayan languages have a derivational suffix *-ooj* which attaches to transitive roots. In most cases this is an infinitival form, which always appears subordinated to a matrix verb, and which takes a bare noun as a generic object, as in example (1) from Poqomam. In (1), the bare noun *ab'iix* 'cornfield' functions as a generic, indefinite object to *tik* 'sow' (as opposed to a definite noun phrase like *la ab'iix* 'the cornfield'). This suggests that *-ooj* triggers some form of noun incorporation.

POQOMAM (Santos Nicolás and Benito Pérez 1998: 439)

(1)	*x-Ø-u-qap*	***tik-ooj***	***ab'iix***	*la*	*sa*	*imaas*
	COM-B3-A3-begin	sow-INF	cornfield	DET	DIM	man

'The man began to sow the cornfield'
or 'The man began the sowing of the cornfield'

In some languages, including Poqomam, the *-ooj*-infinitive always behaves syntactically as a nominal form: for example, *tikooj ab'iix* 'sowing milpa' above is the syntactic direct object of *xuqap* 'he began'. This construction occurs in all K'iche'an languages that have

the suffix. Additionally, Ch'olan-Tseltalan languages have frozen action nouns derived with the *-oj* suffix (see section 6.2.2.5).

However, in other Mayan languages, including Q'anjob'al, the *-ooj* infinitive is not always clearly nominal. In (2), *cheqlaytoq* 'be sent' is a passive verb whose single argument is *in* 'I'. *iloj awal* 'to watch the cornfield' follows as a complement clause, but it cannot be construed as a nominal argument of the verb because the verb's only argument position is occupied.

Q'ANJOB'AL (Mateo Toledo 2008: 293)

(2)	*ch-in*	*cheq-lay-toq*	***il-oj***	***awal***	*y-uj*	*hin-txutx...*
	INC-B1S	send-PAS-DIR	see-INF	corn.plant	A3S-by	A1S-mother

'I was sent to watch/take care of the cornfield by my mother...'

Finally, in Tseltalan languages and in Poqom, *-ooj* can appear as a marker of perfect aspect, where the verb it attaches to is the main predicate of the sentence. In Tseltal and Tsotsil, *-oj* marks perfect aspect on active transitive verbs, while in Poqom, *-ooj/-uuj* creates a passive perfect participle of transitive roots.

TSELTAL (Polian 2013: 166)

(3)	*K-il-**oj**-at.*
	A1-see-PERF-B2

'I have seen you.'

POQOMCHI' (Mó Isém 2006: 186)

(4)	*Ø*	*Qop-**ooj***	*naah*	*taqe*	*kanteela*	*aw-uum.*
	B3S	light-PERF	head	P	candle	A2S-RN.by

'The candles have been lit by you.'

I have so far not found any convincing reflexes of *-ooj* in Yucatecan or Wastekan languages, nor does Kaufman (2015: 311) list any. Since all the extant cognates are in Eastern and Western Mayan languages, the suffix can only be confidently reconstructed to Proto-Central Mayan.

Since *-ooj* is attested in both Q'anjob'alan and K'iche'an languages as an infinitive, this function likely reconstructs to proto-Central Mayan. In addition, the *-ooj*-infinitive takes a generic object in both subgroups, suggesting that this incorporating structure is a retention. The evidence strongly suggests that the use of *-ooj* reflexes as markers of perfect aspect is innovative. (I will justify each of these claims in more detail in the sections that follow.)

Formally, **-ooj/-uuj*-derived forms act like nominalizations. K'iche'an languages consistently (and Q'anjob'alan languages sometimes) use *-ooj*-infinitives in nominal contexts, such as the object position of a matrix verb. In addition, Q'anjob'alan languages can use *-oj*-infinitives in adverbial purpose clauses, even when no nominal argument slot is available; this usage could be an innovation or a unique retention. However, the fact that K'iche'an *-ooj*-infinitives appear exclusively as arguments of verbs does not prove that they are strictly nominal; depending on the language, they may pattern differently from true nouns in that they cannot be possessed, modified with adjectives, or take determiners. The same is true of the English infinitive, which appears in verbal argument slots like a noun (compare "I want *to go to the store*"/"I want *that*"; "*To err* is human"/"*It* is human") but cannot take other nominal modifiers (*"My long *to go to the store* went badly," intended reading 'My long trip to the store went badly'). A full comparison of the

verbal or nominal modifiers that occur with **-ooj/-uuj* will require more data than is currently available in published sources.

6.2. BASIC DATA

6.2.1. Summary of cognate forms

Table 18 shows the languages for which an *-ooj* form is attested, with the function that it has in each language. I will expand on the form and function in later sections. There are other *-Vj* suffixes in each language that I have not listed as cognates, which will be discussed below.

Branch	Language	Form	Function
K'iche'an	K'iche'	*-ooj/-uuj ~ -oj/-uj*	1. Subordination[48] 2. Unproductive deverbal noun
	Kaqchikel	*-oj/-uj*	1. Subordination 2. Unproductive deverbal noun
	Tz'utujil	*-ooj/-uuj ~ -oj/-uj*	Subordination
	Poqomam	*-ooj/-uuj ~ -oj/-uj*	1. Subordination 2. Perfect aspect
	Poqomchi'	1. *-V_Rj* 2. *-ooj/-uuj*	1. Subordination 2. Perfect aspect
Q'anjob'alan	Q'anjob'al	*-oj/-uj*	Subordination
	Akateko	*-o***	Subordination
	Popti'	*-o'/-u'***	Subordination
	Mocho'	*-eh*	Subordination
	Chuj	*-(o)j*	Subordination
	Tojol-ab'al	*-uj, -unej*	Perfect aspect
Tseltalan	Tseltal	*-oj, -ej*	1. Perfect aspect 2. Unproductive action noun
	Tsotsil	*-oj*	1. Perfect aspect
Ch'olan	Chol	*-oh*	Unproductive action noun
	Ch'orti'	*-oj*	Unproductive action noun

Table 18: Functions of **-ooj/-uuj* descendants in Mayan languages. A double asterisk indicates a non-cognate form included for discussion.

The crucial points of variation to note in the above table are the variety of functions that appear across the family. Depending on the language, **-ooj* reflexes may either (1) mark a subordinated transitive verb, (2) create a nominalization of a transitive verb, or (3) indicate perfect aspect on transitive verbs.

[48] All varieties of K'iche' have frozen nominalizations with the *-ooj* suffix, but only the Nahualá and Santa Catarina Ixtahuacán varieties use the suffix productively.

6.2.2. Cognacy questions

6.2.2.1. Poqom infinitive and participle

Poqomam and Poqomchi' both have two suffixes derived from **-ooj/-uuj*, one which marks a compound-forming infinitive and one that marks the passive perfect participle. In Poqomam, the two suffixes are phonologically identical and follow the same vowel harmony pattern as in other K'iche'an languages: the basic suffix is *-ooj*, varying to *-uuj* after a root vowel /u/.

POQOMAM (Benito Pérez 2007: 79)

(5)	a.	*tik-**ooj***	'to sow', '(has been) sown'	< *tik-* 'sow'
	b.	*yok'-**ooj***	'to cut', '(has been) cut'	< *yok'-* 'cut with machete'
	c.	*p'us-**uuj***	'to fold', '(has been) folded'	< *p'us-* 'fold, double over'

In Poqomchi', the two suffixes have become more distinct: the perfect participle suffix retains the *-ooj/-uuj* allomorphy, while the infinitive suffix fully assimilates to the root vowel, becoming *-V_Rj*.

Despite this difference, the Poqomchi' infinitival *-V_Rj* is clearly related to the participial *-ooj/-uuj* in Poqomchi' and cognate with *-ooj/-uuj* in other K'iche'an languages. In a few cases the Poqomchi' infinitive surfaces with a non-harmonic /o/ vowel (6b), showing that the suffix is *-oj* underlyingly.

POQOMCHI' (Mó Isém 2006: 215)

(6)	a.	*il-**ij**...*	'to see…'	< *il-* 'see'
	b.	*ch'ey-**ej**... ~ ch'ey-**oj**...*	'to hit…'	< *ch'ey-* 'hit'

Beyond this, Poqomchi' -V_Rj has the same syntactic distribution as *-ooj/-uuj* infinitives in other K'iche'an languages. The phonological consequences will be discussed in section 6.3 and the syntactic distribution in section 6.5.

6.2.2.2. Q'anjob'alan -oj *and* -V' *suffixes*

Akateko and Popti' have an infinitival *-oj* suffix that looks superficially like a reflex of **-ooj/-uuj* but is actually descended from another suffix **-oq*, the proto-Mayan intransitive dependent suffix. Reflexes of **-oq* appear with intransitive verbs in dependent clauses in every branch of the family (Martin 1998; Kaufman 2015: 291). Popti' and Akateko replaced the **-ooj/-uuj* transitive infinitive with *-o'/-u'* and *-o(')* respectively; the Popti' suffix comes from an older irrealis suffix **-'*, while the etymology of the Akateko suffix is in question. This section discusses transitive infinitives in both languages.

For comparison, closely related Q'anjob'al has both the intransitive *-oq* and the transitive *-oj/-uj*, with no phonological reduction. According to Mateo Toledo (2008: 57-58), *-oq* with intransitive verbs marks irrealis mood, which manifests in potential aspect constructions (7). It also creates infinitives in the sense that it marks uninflected verbs in dependent constructions, including subordinate clauses (8) and secondary predicates such as resultatives (9). Mateo Toledo treats the irrealis *-oq* as synchronically a different suffix

from infinitival *-oq*. In any case, *-oq* is distinct from *-oj/-uj*, which creates infinitives from transitive verbs (10).

Q'ANJOB'AL (Mateo Toledo 2008: 56-57, 89)

(7) *Hoq-on* *way-**oq***
POT-A1P sleep-IRR
'We will sleep.'

(8) *Max-in* *b'et* *[saqch-**oq*** *hey-etoq]*
COM-B1S go.return play-INF A2P-with
'I went to play with you.'

(9) *Max-Ø* *hin-tzok'* *koj-**oq***
COM-B3S A1S-cut grind-INF
'I cut it into pieces.'

(10) *Asan* *[uk'-**oj*** *an]* *ch-Ø-y-une-j*
only drink-INF alcohol INC-B3S-A3S-do-TV.SUF
'It is only drinking alcohol that somebody does.'

As another comparison, in Chuj, *-ok* (<*-*oq*) is the intransitive 'irrealis' or 'potential' suffix (Domingo Pascual 2007: 160; Buenrostro Díaz 2013: 117). Transitive infinitive *-oj* (<*-*ooj/-uuj*) occurs in the expected infinitival contexts, followed by a bare object.

CHUJ (Buenrostro Díaz 2013: 117, 134)

(11) *ichta* *ol=Ø=y-ut-**ok*** *eb'* *anima* *eb'* *masanil*
thus FUT=B3=A3-do-POT PL person PL all
'All the people are going to do it this way.'

(12) *ix=in=s-kol* *waj* *Xun* *[aw-**oj*** *ixim]*
COM=B1=A3-help CL Juan sow-INF corn
'Juan helped me to sow corn.'

In Popti', *q* weakens to uvular fricative *j* word-finally[49] so that intransitive **-oq* becomes *-oj* (*-uj* harmonizing with /u/ in a root, by a productive morphophonological rule; Day 1973: 18). Popti' preserves both the irrealis/potential and the infinitival uses of **-oq*. Compare (13) and (14) from Popti' to (7) and (8) from Q'anjob'al.

POPTI' (Craig 1977: 311; Delgado Rojas et al. 2007: 115)

(13) *ch-in* *uk-**uj***
INC-B1S drink-POT
'I will drink (liquor)'

(14) *xk-ach* *to* *sajch-**oj***
ASP-B2 go play-INF
'you went to play'

Popti' has two different contexts where a *-(V)'* suffix appears. One *-' ~ -b'* suffix occurs with root and derived transitive verbs to mark irrealis mood, and is also glossed as 'future' (Craig 1977: 71) or 'potential' (Delgado Rojas et al. 2007: 115). This suffix attaches to the transitive stem vowel, which is *-a* by default but harmonizes with a root vowel /o/ or /u/.[50] The *-b'* allomorph appears on transitive roots without a final consonant or those ending in *h*, like *xih-* 'comb' in (16), in which case the final *h* is deleted (Delgado Rojas et al. 2007: 115). Crucially, irrealis forms are not infinitives: they can appear in both matrix and subordinate clauses, and they occur with person agreement markers (15-17).

[49] Seen also in, for example, proto-Mayan **winaq* 'man' > Popti' *winaj* (Kaufman and Justeson 2003: 86; CLJP n.d. 498).

[50] In closely related Q'anjob'al, *-a'/-o'/-u'* is the transitive category suffix, with no particular aspectual reading (CLQ 2005: 63). According to Robertson (1992: 158-163), Popti' maintains the earlier situation: **-a'* was originally associated with irrealis mood, and Q'anjob'al extended it to realis contexts.

POPTI' (Craig 1977: 320; Delgado Rojas et al. 2007: 115, 135)

(15) *ch-in to hach hin-kol-**o-'***
ASP-B1 go B2 A1-help-TV.SUF-FUT
'I go to help you.'

(16) *Ch-s-xi-**b'*** *hin-mi'* *s-xil* *hin-wi'* *han*
ASP-A3S-comb-POT A1S-mother A3S-RN A1S-hair 1S.CL
'My mother will comb my hair.'

(17) *hach w-il-a-'* *han*
B2S A1S-see-TV.SUF-POT 1S.CL
'I want to see you.'

Another suffix, *-o'/-u'*, behaves more like Q'anjob'al *-oj* in that it takes a bare noun object and does not occur with person agreement (18). Craig (1979: 145) calls this an 'incorporative antipassive' while Delgado Rojas et al. (2007: 142) call it an 'infinitive'. Like *-ooj/-uuj* in K'iche'an, *-o'/-u'* seems to occur exclusively with transitive roots (Delgado Rojas et al. 192). It also shares the same *o/u* vowel harmony pattern (19).

POPTI' (Craig 1979: 145; Delgado Rojas et al. 2007: 142)

(18) *xk-ach to (*haw-)il-**o'*** *qinh*[51]
ASP-B2 go (*A2-)see-AP fiesta
'you went to watch the *fiesta*'

(19) a. *maq'-**o'*** *ixim*
hit-INF corn
'to pound corn'

b. *ux-**u'*** *kapeh*
cut-INF coffee
'to cut coffee'

[51] Spelling follows Craig (1979: 145); elsewhere on the same page she spells this word as *q'inh*, the form listed in CLJP (n.d., 271).

Craig states that the infinitive *-o'/-u'* combines the potential *-'* with a stem vowel *-o/-u* (1977: 245). That said, this infinitival *-o'/-u'* is not just a straightforward extension of the *-'* potential construction, as the stem vowel shows a different pattern of allomorphy: contrast *ilo'* in (18) with *-ila'* in (17). (I do not have any information about the phonology of the infinitive suffix after a transitive root ending in *h* or a vowel, the context where the *-b'* allomorph of the potential suffix appears as described above; I do not discuss this allomorph further here.) Additionally, the potential *-'* occurs with person marking, while infinitival *-o'/-u'* cannot. Verbs marked with potential *-'* occur as main predicates and can have arbitrarily specific noun phrases as objects, as shown in (15-17); in contrast, example (18) shows infinitival *-o'/-u'* subordinated to a motion verb and with a bare noun object. This is a nearly identical distribution to that of the *-oj/-uj* infinitive in Q'anjob'al, but these cannot be related by direct descent; uvular fricatives do not become glottal stops in any other context in Popti'.[52]

What seems to have happened is that Popti' recruited the *-'* potential suffix to fill the role of the transitive infinitive, but kept the infinitive's original syntactic distribution and vowel harmony pattern. Three factors could have motivated this change. One factor is the existing parallel between **-oq* and **-'*: in proto-Q'anjob'alan, both indicated irrealis or optative mood, with intransitive and transitive verbs respectively (Robertson 1992: 158-163). In infinitival contexts, according to the reconstruction I develop in this chapter, **-oq* instead contrasted with **-ooj/-uuj*, the situation preserved in Q'anjob'al and

[52] However, *j* is occasionally deleted before a word boundary in Popti' (Day 1973: 16).

Chuj. As shown in Table 19, the extension of *-*ʼ* from irrealis to infinitival contexts can be seen as analogical levelling between *-oj* (<*-*oq*) and -*ʼ*: the two suffixes are now parallel.

Stage	Function	Intransitive	Transitive
Proto-Q'anjob'alan	Irrealis	*-*oq*	*-*ʼ*
	Infinitive	*-*oq*	*-*ooj/-uuj*
Popti'	Irrealis/Potential	-*oj/-uj*	-*ʼ*
	Infinitive	-*oj/-uj*	-**ʼ**

Table 19: Extension of irrealis *-*ʼ* as an infinitive in Popti'.

A second possible motivation is that when intransitive *-*oq* became -*oj/-uj*, this created ambiguity with the older -*oj/-uj* (<*-*ooj/-uuj*) transitive infinitive. By innovating a new transitive infinitive, speakers maintained the distinction between transitive and intransitive verbs. (The same consideration applies to Akateko, which also underwent *-*oq*>-*oj*, and which seems to have also extended the potential suffix as the transitive infinitive.) Like the replacement of *-*(oo)m* with *-*(o)maj* in Sakapultek and Sipakapense, described in section 5.3.2, this motivation calls to mind Heath's (1998) discussion of formal renewal, where a new affix is recruited to maintain the salience of an older category (in this case, the transitive infinitive, as distinct from the intransitive infinitive). Note that by extending *-*ʼ* to infinitival contexts, Popti' increased the salience of the distinction between transitive and intransitive verbs, but decreased the contrast between potential and infinitive constructions; if salience was indeed a motivation for this

change, it is interesting that the transitivity distinction took priority over the functional contrast.

Third, irrealis mood makes sense as a source for infinitival morphology in Q'anjob'alan languages. As shown in (14) and (15) and discussed at length in section 6.5, a major use of Q'anjob'alan infinitives is to create purpose clauses subordinated to motion verbs. Purpose clauses are inherently irrealis, as the intended purpose may or may not have actually been accomplished; for example, in (15), the speaker may or may not have succeeded in helping the addressee.[53] This contrasts with K'iche'an uses of *-ooj/-uuj*, where the matrix verb is generally vacuous (a light verb 'do') and the infinitive represents an actual (realis) event.

Unlike Craig (1977) and Delgado Rojas et al. (2007), Ross Montejo and Delgado Rojas (2000: 141) list a Popti' suffix *-oj/-uj* creating "action nouns" from both transitive and intransitive verbs (20-21). *-oj/-uj* in the intransitive examples should be understood as a reflex of **-oq* for the reasons stated above, but it is unclear whether the transitive examples in (20a-b) are reflexes of **-ooj/-uuj* or an extension of **-oq* to transitive verbs. Unfortunately, the authors provide only single-word examples with transitive roots, so that it is impossible to use context clues. They mention the *-(V)'* form only as a marker of potential aspect (2000: 71).

[53] At least to the extent that infinitive clauses subordinated to motion verbs are correctly analyzed as purpose clauses (the nuance captured in the English translation) and not simply associated motion. This warrants further research.

POPTI' (Ross Montejo and Delgado Rojas 2000: 141, 246)

(20) a. *tz'un-uj* (RTV)
sow-INF
'to sow'

b. *loq'-oj* (RTV)
buy-INF
'to buy'

c. *tz'un-w-uj* (IV)
sow-AP-INF
'to sow'

d. *loq'-w-oj* (IV)
buy-AP-INF
'to buy'

(21) *X-Ø-w-a'* *wa'-**oj** ya'* *paleh* *an.*
COM-B3S-A1S-give eat-INF CL priest CL
'I gave the priest something to eat.'

In Akateko, intransitive dependent suffix **-oq* became *-oj* as in Popti' (22). This is a result of a more general sound change where **q>j* word-finally (Zavala 1992: 15-16, Martin 1998: 199). The transitive infinitive, which takes a bare noun object, appears as *-o* in Zavala's examples (23).

AKATEKO (Zavala 1992: 87)

(22) *x-in-jul* *wey-**oj***
COM-B1S-come sleep-INF
'I came to sleep.'

(23) *txon-**o** si'* *Ø-y-un* *naj* *xunik* *'ewi*
sell-INF firewood B3-A3-do CLS.man Juan yesterday
'Selling firewood is what Juan did yesterday.'

The Akateko normative grammar (Silvestre Sánchez 2015) shows a few examples where the infinitive ends in a glottal stop as in Popti' (24c-d). Unlike in Popti', the Akateko suffix does not undergo vowel harmony with a root vowel /u/: the examples in (24) have an invariant /o/ vowel.

AKATEKO (Silvestre Sánchez 2015: 233)

(24) a. *laq'-**o*** 'to hug' < *laq'* 'hug'
b. *txum-**o*** 'to twist' < *txum* 'twist'
c. *ij-**o'*** 'to carry' < *ij* 'carry'
d. *uk'-**o'*** 'to drink' < *uk'* 'drink'

The presence of a glottal stop in Silvestre Sánchez's examples immediately suggests a connection to the irrealis suffix as in Popti', but the situation is more complicated in Akateko. As in Q'anjob'al (page 254, footnote 50), the proto-Q'anjob'alan *-*a'* irrealis suffix has become the -*V(')* transitive category suffix in Akateko, unmarked for aspect or mood. The category suffix -*V(')* disappears phrase-finally, and it shows limited vowel harmony: it is underlyingly -*a'* but assimilates to a root vowel /o/ or /u/ (Zavala 1992: 64), unlike the infinitive -*o*.

Zavala (1992) states that the Akateko -*o* infinitive is cognate with the -*o'*(/-*u'*) infinitive in Popti'. However, he does not think the -*o* infinitive and -*V(')* transitive category suffix are synchronically related within Akateko, because (*contra* Silvestre Sánchez 2015) the infinitive suffix lacks a final glottal stop (Zavala 1992: 85-86, footnote 50).

Note that it is not out of the question for Akateko *-o* to be a reflex of **-ooj/-uuj*. Final *j* is sometimes elided in Akateko: the word for 'girl' appears as either *k'opoj* or *k'opo* (Zavala 1992: 98, 262). Proto-Mayan **joj* 'raven' (Kaufman and Justeson 2003: 627) appears as Akateko *joo* (Zavala 1992: 25).

Future fieldwork may clarify two points: First, whether the glottal stop in Silvestre Sánchez's examples (35c-d) is spurious or robust. As noted above, these examples are from a normative grammar and appear only in isolation, not in a sentence context, and they contradict Zavala's statement that the suffix lacks a glottal stop. Second, future work may identify the conditions under which final **j* is deleted in Akateko. Both of these points speak to whether the **-ooj/-uuj* infinitive or **-'* irrealis suffix is the more likely source of Akateko *-o*.

I include both Popti' *-o'/-u'* and Akateko *-o(')* in the rest of the discussion in this chapter. Even though the form of Popti' *-o'/-u'* comes from the **-'* irrealis suffix, its distribution more strongly reflects that of the **-ooj/-uuj* infinitival suffix that it replaced, as I discussed above. The same observation applies in Akateko, though I consider the etymology of *-o(')* less certain. When reconstructing the original contexts of use of **-ooj/-uuj*, I will not base my analysis on these (potentially) non-cognate suffixes, but throughout this chapter I will show how their distribution compares to **-ooj/-uuj* reflexes in other Mayan languages.

6.2.2.3. Tojol-ab'al -uj/-unej

Tojol-ab'al's *-uj, -unej* perfect suffix is listed in Table 18, although there is some disagreement about its source. Law (2017a) and Gómez Cruz (2017) argue that Tojol-ab'al is a Tseltal-Chuj mixed language. Law (2017a: 55-56) considers *-unej* to be derived from the Chuj perfect suffix *-nak* (ultimately from proto-Mayan *-*Vnaq*), with a final *k>j* change. The same view was advanced by Kaufman (1984) and Dakin (1988) (both cited in Gómez Cruz 2017).

Gómez Cruz (2017: 127-129) instead argues that Tojol-ab'al *-uj, -unej* is cognate with Tseltal *-oj* (<**-ooj/-uuj*). Kaufman's most recent working paper suggests the same relationship (2015: 311). Gómez Cruz cites the following near-identical sentences from Tseltal and Tojol-ab'al:

TOJOL-AB'AL (Gómez Cruz 2017: 127)
(25) *S-jam-**uj**-Ø* or *S-jam-**unej**-Ø*
A3-open-PERF-B3
'He/she has it open.'

TSELTAL (Polian 2013: 167)
(26) *S-jam-**oj**-Ø.*
A3-open-PERF-B3
'He/she has it open.'

I would suggest a third possibility: perhaps *-uj* is directly from Tseltal, while *-unej* is a reflex of Chuj *-nak* that has shifted to more closely resemble *-uj* (so that they now act as long and short forms of the same suffix). The complexity of the Tojol-ab'al contact situation renders it challenging to find a definitive answer.

6.2.2.4. Ch'olan -(y)aj

Several Ch'olan languages have a *-(y)aj* antipassive or nominalizing suffix. Based on its distribution, as I will discuss below, it does not seem to be related to **-ooj/-uuj*.

Language	Suffix	Function	Source
Chol	*-(y)aj*	Nominalization/ Antipassive	Vásquez Álvarez 2011: 181, cit. Walters 2020: 31
Chontal	*-(ay)aj*	Nominalization/ Antipassive	Osorio May 2005: 167, cit. Walters 2020: 31
Cholti'	*-ya*	Nominalization	Robertson et al. 2010, Morán 1695, cit. Walters 2020: 31
Ch'orti'	*-(y)aj*	Nominalization	Walters 2020: 31

Table 20: *-(y)aj* nominalizing antipassive in Ch'olan languages.

Walters (2020) reconstructs**-yaj*, phonemically */-jax/, as a nominalization in proto-Ch'olan (2020: 29, 34). Robertson et al. (2004: 285) suggest that *-yaj* is a combination of two "nominalizing antipassive" suffixes **-y* and **-aj*. In Robertson et al.'s (2004) view, **-aj* also appears in *-Vj-el* "nominalizing antipassives" in Tseltal, which I discuss further in section 6.2.2.5 below.

Some aspects of the distribution of *-(y)aj* resemble that of *-ooj/-uuj* in other languages. For example, forms with *-(y)aj* sometimes appear subordinated to a verb meaning 'do', like other **-ooj/-uuj* reflexes. The Chol and K'iche' examples below both illustrate this pattern.

CHOL (Vazquez Álverez 2011: 181)

(27) *tyi i-cha'l-e-Ø ts'äk-a-y-**aj**, tyi i-cha'l-e-Ø koty-a-y-**aj***
PFV A3-do-DTV-B3 cure-DTV-EP-AP PFV A3-do-DTV-B3 help-DTV-EP-AP
'He (Jesus) cured, he helped' (lit. 'He did curing, he did helping')

K'ICHE' (Larsen 1988: 405)

(28) *tajin ki-Ø-ki-b'an ri q'at-**ooj***
PROG INC-B3S-A3P-do DET cut-NOM
'They are harvesting the wheat' (lit. 'They are doing the wheat harvest')

However, if this suffix is a reflex of **-ooj/-uuj*, it displays several oddities. First, the sound correspondences are off: Proto-Ch'olan **-aj* has an /a/ vowel, while the Q'anjob'alan, Tseltalan, and K'iche'an reflexes of **-ooj/-uuj* have /o/ in the basic form. **o>a* is not a regular sound change that occurred in Ch'olan. For more discussion about the phonological reconstruction of **-ooj/-uuj*, see section 6.3.

Second, **-ooj/-uuj* at least in K'iche'an languages is limited to transitive roots, while the *-yaj* suffixes of Ch'olan languages seem to be restricted to derived transitive verbs (Walters 2020; though as a contrary perspective, MacLeod (2004: 323-324) claims that *-yaj* in Classic Mayan was restricted to transitive roots, and that all apparent DTV examples of *-yaj* in the glyphs really represent a temporal clitic *-iiy*). As I will show later in this chapter, **-ooj/-uuj* can only be confidently reconstructed with transitive roots; whether proto-Central Mayan had a DTV cognate of the suffix is an open question (see section 6.3.3 below).

6.2.2.5. Ch'olan-Tseltalan -oj(-el)

Becquey (2014) cites an unproductive *-oj* suffix in Chol and Ch'orti' (29, 30a). This suffix occurs only in one frozen form meaning 'to cure' or 'curing rite' that is clearly cognate between the two languages, so he reconstructs the suffix as unproductive in proto-Ch'olan (Becquey 2014: 473, 1000). Becquey does not cite the sources of these forms; the Ch'orti' form is attested in Hull's (2016) dictionary, but I have not found corroboration for the Chol form. Hull gives an additional example with *-j* attaching to an *-e*-stem verb (30b).

CHOL (Becquey 2014: 473)
(29) *il-oj* 'to cure' < RTV *il-* 'heal through ritual prayer'

CHORTI' (Hull 2016: 302, 332)
(30) a. *nir-oj* 'healing prayer, curing rite' < RTV *nir-* 'heal'
b. *petz'-e-j* 'stacking pains caused by evil eye' < DTV *petz'-e* 'stack (up)'

A combination of suffixes, *-o-j-el*, productively creates action nominalizations in Ch'olan languages, as in (31) from Chol and (32) from Ch'olti'. In this case it is difficult to tell if *-o-j* is actually acting as a nominalization. The way Becquey glosses it, *-o-j* seems to be merely intransitivizing the verb, while *-el* is the nominalizing affix; *-el* normally creates nominalizations from intransitive verbs in Chol and Ch'olti' (Sattler 2004: 385; Robertson et al. 2010: 185-186; Vázquez Álvarez 2011: 101-103). Once again, Becquey does not give a citation for the Chol form; Vázquez Álvarez (2011) does not give any examples of this construction.

CHOL (Becquey 2014: 469)
(31) *k'el-o-j-el*
see-AP-IV-NOM
'action of seeing'

CH'OLTI' (Morán 1695, cited in Becquey 2014: 485)
(32) <machi ahcalohel tuba tuyanil ilbil ma ilbil?>

majchi	*ah-ka'l-**o-j-el***	*tub'a*	*tuyanil*	*il-b'il*	*ma'*	*il-b'il*
who	AGT-make-AP-IV-NOM	PREP	all	see-PTCP	NEG	see-PTCP

'Who created all that is visible and invisible?'

Tseltal has frozen forms with *-oj* or *-(o)j-el*, likely cognate with the Ch'olan suffixes. Polian treats these all as examples of the same *-oj* nominalizing suffix, though as with the Cholan examples above, one could also see them as two different suffixes. *-oj* in (33) is the sole nominalizing suffix, whereas the *-(o)j* of *-(o)j-el* in (34) may be an antipassive suffix, creating an intransitive base that the true nominalizer *-el* attaches to.

TSELTAL (Polian 2013: 462)
(33) *k'aj-**oj***
harvest-NOM
'harvest (n.), to harvest'

(34) a. *nuts-**(o)j**-el*
hunt-NOM-NOM
'hunt (n.)'

b. *kum-**(o)j**-el*
double.over-NOM-NOM
'action of folding over a corn plant'

c. *nop-**(o)j**-el*
learn-NOM-NOM
'study (n.)'

As mentioned in section 6.2.2.4, Robertson et al. (2004) identify a "nominalizing antipassive" *-aj* suffix that appears across Ch'olan-Tseltalan languages, including Classic Mayan. In their view, Tseltal *-Vj-el* and Ch'olan *-y-aj* nominalizations (discussed below) contain the same *-aj* suffix (Robertson et al. 2004: 285). They do not connect *-aj* to the *-ooj/-uuj* action nominalizations of K'iche'an and Q'anjob'alan. MacLeod (2004: 313-317) instead suggests that the Classic Mayan *-Vj* suffix was the active perfect marker in Classic Mayan. MacLeod's identification was largely based on Kaufman's reconstruction of **-o-ej* as the proto-Mayan "active perfect participle/gerund" (Kaufman 2015: 319) and so citing this form as evidence for the reconstruction runs some risk of circularity.

I do not attempt to weigh in on the hieroglyphic question here. For now, I note only that under one interpretation, the glyphic data are consistent with the idea that Classic Mayan *-Vj* was an action nominalization, consistent with the unproductive Chol and Ch'orti' reflexes mentioned above (29-30). Given the evidence presented in section 6.4 that proto-Central Mayan **-ooj/-uuj* was an action nominalization and that the Tseltalan *-oj/-ej* perfect is innovative, this analysis implies that proto-Ch'olan-Tseltalan also used the suffix only as an action nominalization; its extension to perfect aspect is unique to Tseltalan. MacLeod's (2004) interpretation where Classic Mayan *-Vj* is an active perfect marker instead supports reconstructing **(-o)-ej* with an active perfect meaning in proto-Ch'olan-Tseltalan.

Probably unrelated but worth mentioning here, Ch'olan-Tseltalan languages also have reflexes of a proto-Mayan **-V-j* suffix that creates intransitive verbs from non-

verbal roots (Robertson and Law 2009: 297-301). The Tseltal reflex of this suffix is normally *-aj*, but the vowel varies to *-ej*, *-oj*, or *-uj*, variation that Polian does not attempt to analyze (Polian 2013: 364). This *-Vj* differs from a true antipassive in that it creates intransitive verbs only from non-verbal bases. Thus, verbalizing *-Vj* does not have a clear historical connection to the *-aj* "nominalizing antipassive," which appears on verbal bases; Robertson discusses the two suffixes in separate papers (Robertson et al. 2004, Robertson and Law 2009) without suggesting a connection.

For his part, Kaufman states that the *-j* "(unspecified) intransitivizer" in Tseltalan is a reflex of proto-Mayan **-aj*, "mediopassive" suffix of DTVs, which has passive reflexes in other branches of the family (2015: 349). However, because he does not give any examples, it is unclear which Tseltalan *-j* suffix he is referring to: the *-Vj* suffix that verbalizes non-verbal stems, the *-Vj* antipassive, or both.

Note that the meaning of *k'ajoj* '(to) harvest' in (33) is very similar to that of frozen *-ooj/-uuj* nominalizations in K'iche', such as *muquuj* 'sowing of wheat' or *ch'olooj* 'plowed land prepared for sowing wheat' (69 below). Farming seems to be a common context in which these nominalizations become lexicalized, perhaps because the action of planting or harvesting is so culturally salient and closely linked to its resultant object (the grain that is planted or harvested).

Tseltal additionally has an *-ej* suffix that creates action nominalizations of intransitive roots and stems, e.g., *a'y-ej* 'to converse' (or 'the act of conversing'; Spanish *platicar*) from the intransitive root *a'ay-* 'hear' (Polian 2013: 340). I mention it here for completeness because it could be related, though this chapter focuses on transitive

derivations. See also *-e(e)h* that occurs with both transitive and intransitive verbs in Mocho (Kaufman 1967: xii), discussed in section 6.3.3 below.

Because there are so few examples, it is difficult to tease apart the relationships between the suffixes. In my opinion, Ch'olan-Tseltalan action nominalizations in *-oj* as shown in (29-30) and (33) could be reflexes of the **-ooj/-uuj* suffix, which can be reconstructed as an action nominalization based on the Q'anjob'alan and K'iche'an reflexes. If this is the case, they occur only as frozen nouns: they do not incorporate a bare noun object as in Q'anjob'alan or K'iche'an (see section 6.6). On the other hand, *-oj-el* in (31-32) and (34) seems to be an antipassive *-Vj* (unrelated to **-ooj/-uuj*) followed by an *-el* intransitive action nominalization.

6.3. PHONOLOGY

As I established previously, the apparent lack of cognates in the Yucatecan and Wastekan subgroups means that a suffix can only be reconstructed to proto-Central Mayan (the ancestor of all Mayan languages besides Yucatecan and Wastekan), and not to proto-Mayan. In this section I argue that the proto-Central Mayan suffix should be reconstructed as **-ooj/-uuj*, where the **-uuj* form appears after a verb root containing /u/ and **-ooj* appears with all other roots. The long vowel of the suffix may have shortened to **-oj/-uj* when the infinitive was followed by an object.

Table 21 gives more detail about the allomorphy of the suffix in the languages that have it. Unless otherwise specified, when the suffix is listed as *-ooj/-uuj* or *-oj/-uj*, this indicates that the form with /u/ appears after a verb root with an /u/ vowel, while the form with /o/ appears elsewhere. Akateko *-o(')* and Popti' *-o'/-u'* are included in the discussion here, as I argued in section 6.2.2.2 that their distribution (including vowel harmony) was directly influenced by **-ooj/-uuj*, despite not being cognate.

Branch	Language	Phonological form
K'iche'an	K'iche'	*-ooj/-uuj* (when in isolation) *-oj/-uj* (with a bare object)
	Achi	*-ooj/-uuj*
	Kaqchikel	*-oj/-uj*
	Tz'utujil	*-ooj/-uuj* ~ *-oj/-uj*
	Poqomam	*-ooj/-uuj* (when in isolation) *-oj/-uj* (infinitive, when an object follows) Jilotepeque: *-ooj* = [-uax] by regular phonological process
	Poqomchi'	*-V_Rj* (infinitive) *-ooj/-uuj* (perfect)
Q'anjob'alan	Q'anjob'al	*-oj/-uj*
	Akateko	*-o* ~ *-o'***
	Popti'	*-o'/-u'***
	Mocho'	*-e(e)h*
	Chuj	*-(o)j*
	Tojol-ab'al	*-uj, -unej*
Tseltalan	Tseltal	*-oj* after monosyllabic verbs *-ej* elsewhere
	Tsotsil	*-oj*
Ch'olan	Chol	*-oh* (one example)
	Ch'orti'	*-oj* with an RTV *-j* after a DTV stem

Table 21: Phonological form of **-ooj/-uuj* reflexes in each language. A double asterisk indicates a non-cognate form included in the discussion.

6.3.1. Vowel quality

In all of the K'iche'an languages, the infinitive suffix has a vowel quality alternation: the basic form of the suffix has an /o/ vowel, but the vowel assimilates to an /u/ vowel in the root. In Poqomchi', this alternation is preserved in the perfect participle *-ooj/-uuj*, but the

infinitival suffix undergoes even more complete vowel harmony: it almost always assimilates to the root vowel.

The more complete vowel assimilation seen in Poqomchi' should be seen as an innovation, for three reasons. First, it is unique to Poqomchi'. Second, the underlying /o/ vowel sometimes surfaces: depending on the variety, the infinitives of *ch'ey-* 'hit', *il-* 'see', and *b'an-* 'do/make' can appear respectively as *ch'ey-ej*, *il-ij*, and *b'an-aj* (with vowel harmony) or as *ch'ey-oj*, *il-oj*, and *b'an-oj* (with a non-harmonic /o/ vowel) (Mó Isém 2006: 215, Malchic Nicolás et al. 2000: 115). Third, total vowel assimilation is a normal type of sound change and is particularly common in Poqomchi', though I know of no source that systematically describes its distribution. Table 22 shows two cognate sets from K'iche', Poqomchi', and Q'eqchi' (all K'iche'an languages), where the vowels of the Poqomchi' cognate have assimilated to one another. The cognates in Table 22 are from Kaufman and Justeson (2003: 532-533, 1466); the proto-K'iche'an reconstruction is my own.

Proto-K'iche'an	Poqomchi'	K'iche'	Q'eqchi'	Gloss
**atin-*	***i****tin-*	*atin-*	*atin-*	'bathe'
**oxib'*	***i****xib'*	*oxib'*	*oxib'*	'three'

Table 22: Partial cognate sets from K'iche'an languages, showing Poqomchi' vowel harmony.

Other Poqomchi' suffixes show the same pattern of total assimilation seen with the infinitive. For example, the proto-K'iche'an *-*oom/-uum* perfect suffix becomes -V_R*m* in Poqomchi', harmonizing with the root vowel (Mó Isém 2006: 221); K'iche', Kaqchikel, and Tz'utujil preserve the original *o/u* vowel harmony pattern (see discussion in section 4.2.1.2).

Unlike Poqomchi', Poqomam preserves the *o/u* distinction in both the infinitival and participial versions of -*ooj/-uuj*. The variety spoken in San Luis Jilotepeque underwent a regular sound change of **o:>ua* (Smith-Stark 1983: 100) which affected the suffix: -*ooj* is pronounced as [-uax]. Again, this is clearly an innovation, with a very limited geographic distribution.

In the Q'anjob'alan subgroup, Q'anjob'al -*oj/-uj* and Popti' -*o'/-u'* show the same *o/u* alternation.[54] This is a general phonological rule in both languages: /o/ in a suffix normally (but not always) harmonizes with an /u/ vowel in a root (Day 1973: 18; Delgado Rojas et al. 2007: 142; Mateo Toledo 2008: 114). Smith-Stark (1983: 134) suggests that the Popti' and Poqomam vowel harmony rules are cognate. Thus, it seems justified to reconstruct the same vowel quality alternation to proto-Central Mayan: **-ooj/-uuj*.

Akateko lacks *o/u* harmony: the suffix is always shown with an /o/ vowel, even in examples where the root has /u/ (35). This lack of vowel harmony could be due to sound change or analogy. In Silvestre Sánchez's examples, the suffix appears as -*o'* with a glottal stop when the root begins in a vowel (35c-d) and as -*o* otherwise (35a-b). Silvestre

[54] As I argued in section 6.0 above, Popti' -*o'/-u'* is a reflex of the proto-Q'anjob'alan **-'* transitive irrealis suffix rather than of **-ooj/-uuj*, but -*o'/-u'* has a different vowel harmony pattern from the irrealis suffix (which is /a/ by default, harmonizing with /o/ or /u/). I attribute the difference to influence from the **-ooj/-uuj* infinitive that -*o'/-u'* replaced.

Sánchez does not call attention to this difference; he cites the suffix as *-o* in the main text (2015: 233). I have discussed the potential origin of this suffix in 6.2.2.2 above.

AKATEKO (Silvestre Sánchez 2015: 233)

(35)	a.	*laq'-**o***	'to hug'	< *laq'* 'hug'
	b.	*txum-**o***	'to twist'	< *txum* 'twist'
	c.	*ij-**o'***	'to carry'	< *ij* 'carry'
	d.	*uk'-**o'***	'to drink'	< *uk'* 'drink'

Mocho' differs from other Q'anjob'alan languages in that the suffix has the form *-eh* or *-eeh*, said to appear with both intransitive and transitive verbs (Kaufman 1967: xii). Examples are shown in (36); note that these examples include IVs and DTVs, but I have not come across any based on an unambiguous RTV, and so it does not directly compare to the other reflexes discussed here. I discuss the use with DTVs in section 6.3.3 below.

MOCHO' (Kaufman 1967: 170, 173, 175)

(36)	a.	*moh-tz'-eeh*	'marriage'	< IV *moh-tz'-* 'get married'
	b.	*'uk'-eeh*	'a drink'	< IV or TV *'uk'-* 'drink'
	c.	*waach-eeh*	'sleepiness'	< IV *wach-* 'sleep'
	d.	*wa'-s-eeh*	'expense, what to eat'	< DTV *wa'-s-* 'give someone to eat'

The Tojol-ab'al active perfect suffix is *-uj/-unej* with invariant /u/. As I noted in section 6.2.2.3, this suffix may have undergone irregular sound changes in the context of language mixing between Chuj and Tseltal: I see *-uj/-unej* as a convergence of the perfect suffix **-inaq* (by way of Chuj *-nak*) with **-ooj/-uuj* (via Tseltal *-oj*). It is worth noting that other suffixes have undergone **o>u* raising in Tojol-ab'al: the proto-Mayan **-oq* irrealis suffix becomes *-uk*, a form that Tojol-ab'al shares with Tseltal and Tsotsil

(Gómez Cruz 2017: 30). This example does not establish a regular vowel correspondence—the irrealis suffix has an /u/ vowel in both Tojol-ab'al and Tseltal, whereas *-uj/-unej* in Tojol-ab'al corresponds to *-oj* in Tseltal—but does suggest a general trend toward /u/-initial suffixes in Tojol-ab'al.

The putative cognates with the root *il* or *ir* 'see' in Chol and Ch'orti' have an /o/ vowel (section 6.2.2.5 above).

The Tseltalan cognates, which indicate perfect (or "stative") aspect on transitive verbs, support the idea that the basic form of the suffix had an /o/ vowel. Tsotsil has *-oj* with both RTVs and DTVs. (38b) below is derived using the *-be* "indirective" suffix that promotes an indirect object to the direct object; the new direct object in (38b) is the person affected indirectly by the killing, the owner of the animal that was killed.

TSOTSIL (Haviland 1981: 227; Sarles 1966: 57)

(37) *J-man-**oj*** *j-ka'* (RTV)
A1-buy-PERF A1-horse
'I have bought my horse.'

(38) a. *j-mil-**oj**-tik* (RTV)
A1-kill-PERF-1P
'we had killed it'

b. *la-j-mil-be-**oj*** (DTV in *-be*)
PST-A1-kill-INDIR-PERF
'I have/had killed it (his)' [or 'I have/had killed (it) for him' -JT]

Tseltal has *-oj* with monosyllabic transitive verbs (Polian 2013: 165), which mostly (but not entirely) correspond to transitive roots (39). Unlike the languages surveyed so far, however, Tseltal has *-ej* with verbs of more than one syllable. This includes *jelbin* which

Polian glosses as a polysyllabic root (40) and monosyllabic roots with derivational suffixes attached (41).

TSELTAL (Polian 2013: 166-167)

(39) *K-il-**oj**-at.*
A1-see-PERF-B2
'I have seen you.'

(40) *[j-]Jelbin-**ej**-tik-Ø* *te* *ch'in* *axux=e.*
A1-put.in.satchel-PERF-1P-B3 DET DIM garlic=DET
'We were carrying the garlic in the satchel.'
[lit. 'We had put the garlic in the satchel' -JT]

(41) a. *S-jam-**oj**-Ø.*
A3-open-PERF-B3
'He/she has it open.'

b. *S-jam-tilay-**ej**-Ø.*
A3-open-DISTR-PERF-B3
'He/she has each of them open.'

It would be simple enough to say that the **o>e* change is a Tseltal innovation, perhaps a morphophonological change related to syllable count. However, Polian indicates that a change is occurring in the opposite direction in the Oxchuc variety of Tseltal: polysyllabic verbs that previously had *-ej* are now regularizing it to *-oj* (Polian 2013: 167). In addition, Mocho' has the form *-eeh* which occurs minimally with IVs and DTVs, suggesting a possible cognate relationship. The difficulty is that very few other Mayan languages preserve a reflex of the suffix with DTVs, and not all DTV reflexes have the /e/ vowel (see discussion in section 6.3.3), so that it is unclear whether these cases are retentions or separate innovations.

In any case, we have enough evidence to reconstruct the vowel quality of the proto-Central Mayan suffix: it took the form *-*ooj* with RTVs, varying to *-*uuj* after a root vowel /u/. The *o/u* alternation is present in both the Q'anjob'alan and K'iche'an subgroups, and Ch'olan-Tseltalan languages also have -*oj* with RTVs, regardless of what is going on with DTVs. The next section will justify reconstructing a long vowel.

6.3.2. Vowel length

The basic form of the suffix clearly had a long vowel; the reflex of the suffix in most of the K'iche'an languages has a long vowel. Vowel length was phonemic in Proto-Mayan. Most K'iche'an languages preserve a length distinction, but the Q'anjob'alan, Tseltalan, and Ch'olan languages represented above have all either lost this distinction or, in the case of Ch'olti', the colonial sources do not indicate vowel length (Law 2014: 39).

Most K'iche'an languages show allomorphy in vowel length, where the suffix will have a short vowel when an object follows and a long vowel otherwise, as in the San Luis Jilotepeque variety of Poqomam:

POQOMAM (SAN LUIS JILOTEPEQUE) (Smith-Stark 1983: 349)

(42) a. *ch'uq-**uuj***
pick-NOM
'picking'

b. *ch'uq-**uj*** *pix*
pick-NOM tomato
'picking tomatoes'

Grammars of other K'iche'an languages often give examples that illustrate the long/short alternation, even if the author of the grammar does not call attention to it; see for example the following examples from Tz'utujil and K'iche':

TZ'UTUJIL (Dayley 1985: 180-181)

(43) a. *b'an-**ooj***
do.make-INF
'to do, make'

b. *b'an-**oj*** *jaay*
do.make-INF house
'to make houses'

K'ICHE' (Larsen 1988: 267-268)

(44) *yoq'-**ooj*** (frozen form)
thresh-NOM
'threshing of wheat'

(45) *b'an-**oj*** *sii'* (Nahualá and Santa Catarina Ixtahuacán only)
do.make-NOM firewood
'firewood making'

In Mó Isém's analysis of Western Poqomchi', the infinitive in -V_Rj never occurs in isolation; it must always have an object (Mó Isém 2006: 216). Infinitive -V_Rj (which incorporates a bare object) always has a short vowel, while the innovative perfect participle *-ooj/-uuj* (which does not incorporate an object) has a long vowel. Even though the difference in vowel length correlates with a difference in function, it is also consistent with the rule seen in other K'iche'an languages, where the vowel is short before a bare object. (In 47, note that *naah taqe kanteela* '(the head of) the candles' is not an incorporated object, but rather the grammatical subject of *qopooj* '(has been) lit'.)

POQOMCHI' (Mó Isém 2006: 186, 216)

(46) *K'ot-**oj*** *papas* *n-Ø-k-a'n,* *lahtz'* *ki-wach.*
dig-INF potatoes INC-B3S-A3P-do busy A3P-face
'They are digging potatoes, they are busy.'

(47) *Ø* *Qop-**ooj*** *naah* *taqe* *kanteela* *aw-uum.*
B3S light-PERF head PL candle A2S-RN.by
'The candles have been lit by you.'

Brown (1979: 44), also writing about Western Poqomchi', treats the vowel length alternation in infinitive -V_R*j* (48) as a consequence of a more general rule that long vowels are shortened when unstressed (49). Poqomchi', like most other K'iche'an languages, has word-final stress (Mó Isém 2006: 45; England and Baird 2017: 181). Brown's analysis presupposes that the infinitive and its object are functioning as one phonological word, so that the incorporated object attracts the main stress of the compound. This presupposition may not be valid for all contexts even in Poqomchi', as sometimes another word such as a preposition can intervene between the infinitive and its object (see examples 125-126 below).

POQOMCHI' (Brown 1979: 44; primary stress marked with an accent)

(48) a. *yok'-**ooj*** 'to cut'
b. *yok'-**oj** iíb'* 'to cut oneself'

(49) a. *b'iich* 'song'
b. *xi-b'ich-éj* 'he sang it'

Larsen notes a similar phonological rule in K'iche': a long vowel will become short when the addition of a suffix causes the syllable to no longer be word-final (Larsen 1988: 35).

Other derivational suffixes in K'iche'an languages show a similar alternation. For example, the *-ool/-uul ~ -ol/-ul* suffix in Tz'utujil, which creates an agent noun from a verb root, has a short vowel when an object follows and a long vowel otherwise.

TZ'UTUJIL (Dayley 1985: 181)

(50) a. *chan-**ol*** *uleep*
till-AGT land
'worker of land'

b. *aj-chan-**ool***
AGT-till-AGT
'peasant'

Not all K'iche'an languages show a long/short alternation with *-ooj/-uuj*. In Kaqchikel, the suffix appears as *-oj/-uj* with an invariant tense vowel, which corresponds to a long vowel in other K'iche'an languages, with or without an incorporated object (51). Short vowels in other K'iche'an languages correspond with lax vowels in Kaqchikel, so that the expected short form would be *-öj/-üj*.[55]

KAQCHIKEL (García Matzar and Rodríguez Guaján 1997: 457)

(51) a. *X-Ø-qa-chäp* *q'at-**oj.***
COM-B3S-A1P-grab cut-INF
'We began to cut wheat.'

[55] Proto-K'iche'an had five vowel qualities (**a, *e, *i, *o, *u*), each of which could be long or short (Campbell 1977). In varieties of Kaqchikel that maintain a ten-vowel system, including the one represented in García Matzar (2007), short vowels became lax vowels *ä, ë, ï, ö, ü* (normally realized as [ɨ, ɛ, ɪ, ɔ, ʊ], though the pronunciation of *ä* varies), and long vowels were reinterpreted as (short) tense vowels. Some Kaqchikel varieties lost the tense/lax distinction for *e, i, o,* and *u,* but all varieties distinguish *a/ä* (Patal Majzul et al. 2000: 35).

b. *X-Ø-qa-chäp* *choy-**oj*** *che'.*
COM-B3S-A1P-grab cut-INF tree
'We began to cut trees.'

López Ixcoy and Sis Iboy (2007) show *-ooj/-uuj* with an invariant long vowel in K'iche', even in examples where it has an incorporated object (52). Sis Iboy (2007) cites examples from Achi (53) which are nearly identical to (52) from K'iche'.

K'ICHE' (López Ixcoy and Sis Iboy 2007: 87)

(52) a. *X-e-b'e* *pa* *loq'-**ooj**.*
COM-B3P-go PREP buy-INF
'They went to buy.'

b. *X-Ø-b'ee* *ri* *ixoq* *pa* *ya'-**ooj*** *wa.*
COM-B3S-go DET woman PREP give-INF food
'The woman went to give food.'

ACHI (Sis Iboy 2007: 85)

(53) a. *X-e-b'e* *pa* *loq'-**ooj**.*
COM-B3P-go PREP buy-INF
'They went to buy.'

b. *X-Ø-e'-k* *ri* *ixoq* *pa* *ya'-**ooj*** *wa.*
COM-B3S-go-IV.SUF DET woman PREP give-INF food
'The woman went to give food.'

These examples disagree with examples (44-45) above from K'iche', which show the long/short alternation. It is difficult to tell whether these discrepancies represent an error in one of the sources or merely inter-speaker variation.

Other examples from multiple varieties of Poqomam break the long/short pattern: in (54-56), the *-ooj* suffix has a long vowel even though an object is present. In (54), the object *sii'* 'firewood' may not be incorporated: the noun *paam* 'stomach' is arguably

acting as a preposition, so that *paam sii'* 'on the firewood' is really a prepositional phrase. In (55-56), this is not the case: the suffix is long even though the infinitive is followed by an unmodified bare noun. Note that this cannot only be a matter of dialectal variation; Smith-Stark's examples in (42) above are also from the San Luis Jilotepeque variety and show the long/short pattern, unlike (56).

POQOMAM (PALÍN) (Santos Nicolás and Benito Pérez 1998: 430)

(54)	*X-ti-ru-q'ut-saa*	*la*	*ch'ir-**ooj***	*paam*	*sii'*
	COM-B2S-A3S-be.tired-CAUS	PRO	cut-INF	RN	firewood

'Cutting the firewood made you tired.'

POQOMAM (MIXCO) (Malchic Nicolás et al. 2000: 271)

(55)	*Ri ra'*	*ak'un*	*tik-**ooj***	*ab'iix*	*x-Ø-i-'an*	*yiyu'*	*haab'*
	DEM	boy	sow-INF	milpa	COM-B3S-A3S-do	DEM	year

'The boy did corn-planting all year.'

POQOMAM (SAN LUIS JILOTEPEQUE) (Malchic Nicolás et al. 2000: 272)

(56)	*Tik-**ooj***	*ab'iix*	*Ø-Ø-ru-'an*	*ma'*	*ak'un*	*riyu'*	*haab'*
	sow-INF	milpa	COM-B3S-A3S-do	ART	boy	DEM	year

'The boy did corn-planting all year.'

Considering all of the above, it seems clear that the proto-K'iche'an infinitive suffix had a length alternation: it appeared as **-ooj/-uuj* when the infinitive appeared in isolation and **-oj/-uj* when an object followed. This alternation appears in multiple K'iche'an languages (K'iche', Tz'utujil, Poqomchi', and Poqomam), though there is some variation among the descriptive sources. This may be a consequence of a more general rule that unstressed long vowels become short, as Brown (1979: 44) suggested for Poqomchi', assuming Brown's analysis that the incorporated object forms a compound with the

infinitive and attracts the main stress away from the suffix. The length alternation was neutralized in Kaqchikel and possibly some varieties of K'iche' and Poqomam.

In principle, the proto-Central Mayan suffix could have had the same long-short alternation. Conversely, it is also possible that the proto-Central Mayan suffix had an invariant long vowel, and that proto-K'iche'an innovated the rule whereby the vowel shortens before an incorporated object. Comparative evidence does not directly address this question, because the non-K'iche'an languages with reflexes of *-*ooj/-uuj* do not distinguish vowel length. Resolving this question will require a deeper look at sound changes between proto-Central Mayan and proto-K'iche'an, including changes in vowel length and stress placement. Most other Mayan languages do not have the consistent final-syllable stress seen in K'iche'an (England and Baird 2017: 181), and Kaufman (1990: 67) suggested that proto-Mayan instead stressed the heaviest syllable. Variation in stress placement could limit how far back in time we can apply Brown's (1979) analysis of the length alternation, which assumes that the incorporation of an object shifts stress away from the infinitive suffix.

6.3.3. What about DTVs?

The above discussion has focused on reflexes that occur with root transitive verbs, but the situation is slightly more complex when derived transitive verbs are included. Kaufman (2015: 311) reconstructed the form of the suffix in proto-Mayan as *-*o-ej* for root transitive verbs and *-*ej* for derived transitive verbs. While he does not justify this form,

it seems to be primarily based on Tseltal, which has *-oj* for monosyllabic and *-ej* for polysyllabic transitive verbs, and Mocho' which has *-e(e)h* with IVs and DTVs. The **-o* in **-o-ej* is assumed to be simply a category suffix marking root transitive verbs (2015: 293). Presumably, under his analysis, the combination **-o-ej* resolved into a long vowel **-ooj* in proto-Central Mayan, explaining the reflexes with an /o/ vowel that attach to transitive roots. As stated above, there is evidence to reconstruct a morphophonological rule to proto-Central Mayan whereby an /o/ vowel in a suffix will normally harmonize with an /u/ in the root (Smith-Stark 1983: 134), leading to the *-ooj/-uuj* alternation observed in Q'anjob'alan and K'iche'an with transitive roots.

The reconstruction of **-ej* with DTVs is not as certain as that of **-ooj/-uuj* with RTVs, because DTV reflexes of the suffix are much less common. In most cases that I have observed, in languages where RTVs use *-ooj/-uuj*, derived transitive verbs from infinitives by first antipassivizing the verb and using the intransitive action nominalization, as in (57) from Poqomam. Interestingly in this example, even though *k'ayinik* 'selling' is based on a morphologically intransitive stem, it still takes a bare noun object (*xuut* 'water jug') just as the *-ooj/-uuj* infinitive would.

POQOMAM (Smith-Stark 1983: 350)

(57)	*hin*	*nu-w-oj-i*	*Jalaap pan*	*k'ay-**in-ik***	*xuut*
	1S.PRO	INC-A1-go-IV.SUF	Jalapa to	sell-AP-NOM	water.jug
	'I'm going to Jalapa to sell water jugs.'				

Mocho's *-eh* or *-eeh* nominalizing suffix can occur with transitive or intransitive verbs (1967: xii). Example (58) shows it with a DTV *ts'ib-a-* 'write' (see also 36d above). The

nominalization takes *kafe* ‘coffee’ as a generic object, consistent with the behavior of *-ooj/-uuj* in other languages (section 6.6). This similar distribution suggests a possible cognate relationship, especially in light of Tseltal’s similar *-ej* perfect suffix that appears with polysyllabic verbs.

MOCHO’ (Pérez González 2021: 125)

(58) *ii-q’ats-a* *ha’-e* *we* *ts’ib-a-**eh*** *kafe*
A1-learn-TV FOC-PL DET write-TV-NOM coffee
‘I learned THOSE, the drawing of coffee lines’

Kaqchikel has an unproductive *-j* DTV nominalizing suffix, corresponding to *-oj/-uj* with RTVs.

KAQCHIKEL (García Matzar 2007: 31)

(59) a. *k’ay-i-**j*** ‘sale, transaction’ < *k’ay-i-* ‘sell’
b. *oq’-e-**j*** ‘tears, act of crying’ < *oq’-e-* ‘cry (something)’

Note that in (59b), *oq’* ‘cry’ is an intransitive verb and *-e* is glossed as a transitivizing suffix; another possible analysis is that *-ej* is an intransitive nominalization. *oq’ej* ‘tears, act of crying’ appears in other K’iche’an languages such as K’iche’ and Uspanteko (Christenson n.d. 85, Can Pixabaj 2007: 185); I have not found examples of *-ej* with other roots, so *oq’ej* may have been a frozen form even in proto-K’iche’an.

Hull (2016: 332) cites the Ch’orti’ form *petz’ej* ‘stacking pains caused by evil eye’ (above, 30b), from the *-e*-stem derived transitive verb *petz’-e* ‘to stack (up)’. This

suffix is unproductive but is consistent with the idea that *-ej* in other languages is a combination of an *-e* stem vowel with a *-j* nominalizing suffix.

These examples weakly suggest that proto-Central Mayan had an **-ej* or **-j* nominalizing suffix of DTVs, paralleling **-ooj/-uuj* with RTVs. If so, its reflexes are not nearly as widespread or as consistent as those of **-ooj/-uuj*. In some of the examples above (30b, 59), the suffix is just *-j*, and the vowel comes from the DTV stem. In Mocho', the vowel seems to be part of the *-eh* suffix; the verb in (58) has a separate transitivizing suffix *-a*. A deeper look at stem vowels and transitivizing suffixes could clarify whether these suffixes are truly cognate, and if so, whether the vowel was originally part of the suffix or not.

6.4. FUNCTION

6.4.1. Overview of functions

In this section, I examine the meanings associated with reflexes of **-ooj/-uuj*. Because both semantic and syntactic change are involved, it is impossible to keep them completely separate, but as much as possible I will focus here on meaning and save the more detailed syntactic discussion for sections 6.5 and 6.6. Table 23 shows the glosses reported for reflexes of **-ooj/-uuj*. These fall into three major categories: an *-ooj*-derived form may (A) refer to the action described by the verb, (B) refer to the patient or result of the verbal action, or (C) express perfect aspect on a transitive verb.

In reading A, the *-ooj* suffix is semantically vacuous, since the resulting form carries the same meaning as the base verb. The function of *-ooj* here is solely structural: it marks a syntactically deverbal form (i.e. an infinitive or action nominalization). Depending on the matrix verb and the discourse context, this can be interpreted as either a specific or habitual action. In such cases, the form often appears as the object of a light verb 'do':

K'ICHE' (Larsen 1988: 410)

(60) *tajin* *ka=Ø=b'aan* *u-q'at-**ooj*** *ri* *a* *Maax*
PROG INC=B3S=do.PAS A3S-cut-NOM DET MASC Tom
'Tom's wheat harvest is being done.'

Q'ANJOB'AL (Mateo Toledo 2008: 89)

(61) *Asan* *[uk'-**oj*** *an]* *ch-Ø-y-une-j*
only drink-INF alcohol INC-B3S-A3S-do-TV.SUF
'It is only drinking alcohol that somebody does.'

In some Q'anjob'alan languages, the *-oj* infinitive can create purpose clauses. In Chuj, in (62), the intransitive motion verb *honh'el* 'we went out' is followed by a subordinate clause *pojj k'atzitz* 'to split firewood' which indicates the reason the speakers went out (the *o* vowel of the suffix is deleted in this case). The infinitive in such cases still refers to the action of the verb, so I classify it under reading A for this section. I will deal with the syntactic side of purpose clauses in section 6.5.

CHUJ (Maxwell 1982: 168)

(62) *Ø-honh-'el* *poj-**(o)j*** *k'atzitz*
REC-A1-go.out split-INF firewood
'We went out to split firewood.'

Category B references an entity that is affected by or the recipient of the action (a patient) or an entity that is created in the course of that action (a result). This reading is present in Poqom and in frozen forms in K'iche'.

For C, I use "perfect aspect" in the broadest sense, referring to a prior event that is relevant at the topic time for one reason or another. In reality, the aspectual category glossed as "perfect" can encompass a variety of readings (see section 1.4), but it would take targeted fieldwork and/or corpus work to determine which specific aspectual readings are available in each language.

Branch	Language	Gloss	Meaning category
K'iche'an	K'iche'	Action Nominalization	Action Frozen forms: patient/result
	Kaqchikel	Infinitive/Active verbal noun	Action Frozen forms: patient/result
	Tz'utujil	Infinitive	Action
	Poqomam	(1) Antipassive Action Nominalization (2) Perfect participle	(1) Action (2) Perfect aspect/Patient
	Poqomchi'	(1) Verbal noun/infinitive; (2) Passive participle	(1) Action (2) Perfect aspect/Patient
Q'anjob'alan	Q'anjob'al	Infinitive	Action
	Akateko	Infinitive	Action
	Popti'	Infinitive	Action
	Mocho'	Verbal noun	Action, Patient
	Chuj	Infinitive	Action
	Tojol-ab'al	Perfect participle	Perfect aspect
Tseltalan	Tseltal	1. Perfect 2. Action noun	1. Perfect aspect 2. Action
	Tsotsil	Stative	Perfect aspect[56]
Ch'olan	Chol	Antipassive verbal noun	Frozen form: Action
	Ch'orti'	Antipassive verbal noun	Frozen form: Action, result

Table 23: Functions of **-ooj/-uuj* reflexes, by language.

Confusingly for reconstruction, both the "action" and "perfect aspect" readings are present in multiple subgroups. Reconstructing only one reading to proto-Central Mayan requires us to claim that the other reading arose in two subgroups independently or through contact. It is possible that both readings were present in proto-Central Mayan, as

[56] Though Haviland (1981) glosses the suffix as 'stative', he defines this as "...the state that results from realizing an action" (1981: 227, my translation), which falls under the broad definition of perfect aspect (a prior event has some relevance at topic time). His examples are consistent with this: *Kilojot 'onox* 'I know your face', lit. 'I have always seen you'; *Smajojon lek; yech'o i'och ta chukel* 'He has hit me a lot, so he went to jail' (1981: 227).

they are in modern Poqomam, Poqomchi', and Tseltal, but I will argue in this section that there is insufficient evidence to reconstruct the perfect reading; this use is innovative.

Kaufman (2015: 319) glosses proto-Mayan **(-o)-ej* (in my reconstruction, proto-Central Mayan **-ooj/-uuj*) as 'perfect participle/gerund'. By this he seems to mean that the suffix had two functions (a gerund and a participle), both of which had a perfect meaning. His term "active perfect gerund," which he also calls "active (perfect?) verbal noun," is based on the reflexes that I have here called action nominalizations. His justification for the "active perfect participle," seemingly an adjectival form, is more tenuous; he relates this to the Tseltalan "perfect status" and the Poqom "passive perfect participle" reflexes (both of which he considers innovative), but no modern reflex of the suffix forms an "active perfect participle" and Kaufman is not clear about how this form would have behaved in proto-Mayan.

By labeling **(-o)-ej* a "perfect participle/gerund," Kaufman is contrasting it with his "incompletive participle/gerund" **-al*. Reflexes of **-al* also form action nominalizations in many Mayan languages, and the suffix reconstructs to proto-Mayan (Kaufman 2015: 319). Despite giving them different labels, he does not give any examples to show how the "perfect participle/gerund" and "incompletive participle/gerund" would have contrasted in meaning or function—in his reconstruction, they can both form action nominalizations. As seen in examples above such as (61) and (62), nominalizing reflexes of proto-Central Mayan **-ooj/-uuj* often appear in clauses that describe habitual actions or create purpose clauses; if anything, these both align more

closely with an incompletive meaning than with the perfect, which refers to a prior completed action.

I argue here that *-*ooj/-uuj* originally had the "action" meaning and that the "perfect" reading was innovated, probably independently, in Poqom and Tseltalan. The first reason for this is simply the majority principle: a reflex with an action reading appears in most of the languages above, including in Poqomam, Poqomchi', and Tseltal which also have the perfect use. The perfect reading is limited to Poqom and Tseltalan (including Tojol-ab'al, insofar as its -*uj/-unej* perfect suffix is seen as a descendant of Tseltal -*oj/-ej*).

The second factor is structural similarity: as will be discussed in sections 6.5 and 6.6, the "infinitive" or "action noun" construction in Q'anjob'alan and K'iche'an, which is associated with the action reading, consistently appears subordinated to a matrix verb, and usually takes a bare noun object in what can be described as noun incorporation. By contrast, the -*ooj*-derived perfect constructions in Poqom and Tseltalan are structurally different: Tsotsil -*oj,* Tseltal -*oj/-ej,* and Tojol-ab'al -*uj/-unej* are used exclusively on transitive verbs in active voice, while in Poqomam and Poqomchi', -*ooj/-uuj* is mostly used as the passive perfect participle of transitive verbs. This structural difference does not prove that the perfect constructions arose independently, but it is what we might expect to see if they had.

The third reason is that there is a clear route by which -*ooj/-uuj* became a perfect in Poqom; it is not cognate with the Tseltalan perfect. Poqom perfect constructions in -*ooj/-uuj* are based on an older use of the suffix as a patient nominalization. In turn,

patient nouns can arise as an extended meaning of action nominalizations. All the intermediate stages of this progression are present in K'iche'an languages, as sections 6.4.2 and 6.4.3 will show. While the pathway from action noun to perfect is not as clear in Tseltalan, section 6.4.4 suggests possible routes by which the Tseltalan perfect could have arisen.

6.4.2. Patient nouns becoming perfect participles in Poqom

In all K'iche'an languages that have an **-ooj/-uuj* reflex, the action reading is available. Poqomam and Poqomchi' can additionally use the suffix to indicate passive perfect participles (47 repeated here as 63).

POQOMCHI' (Mó Isém 2006: 186)

(63)	*Ø*	*Qop-**ooj***	*naah*	*taqe*	*kanteela*	*aw-uum.*
	B3S	light-PERF	head	PL	candle	A2S-RN.by
	'The candles have been lit by you.'					

As noted in sections 2.2.2 and 4.4.3, in many Mayan languages, the "perfect participle" is structurally ambiguous between a verb and a noun. In K'iche', for example, the *-oom/-uum/-m* perfect participle can appear in a predicate to express perfect aspect, as in (64-65), but it can also be used as a noun referring to the patient of an action. In (66), *mokoom* can be interpreted as a passive perfect participle 'his/her services have been asked for' or as a patient noun 'one whose services have been asked for', i.e. 'servant.' This nominal form can be possessed, as in (66b).

K'ICHE' (Larsen 1988: 236)

(64) *at* *nu-ch'ay-**oom***
B2S A1S-hit-PERF
'I have hit you'

(65) *e'* *muq-**uum***
B3P bury-PERF
'They are buried; they have been buried'

(66) a. *mok-oom*
ask.for.the.services.of-PERF
'(one who has been) asked for the services of; servant'

b. ***nu**-mok-oom*
A1S-ask.for.the.services.of-PERF
'my servant'

Larsen suggests that the nominal use may be primary, underlying even the supposedly "verbal" uses. For (64), Larsen suggests the alternate reading 'you are my one-who-has-been-hit' (1988: 238).[57] By extension, (65) could also be read literally as 'they are buried ones'. This ambiguity is possible because Set A person markers are used both for ergative agent agreement and for possessor agreement. In K'iche', the ergative and possessive prefixes differ only in 1st person singular, and crucially, perfect constructions use the nominal version (*nu-/w-*) instead of the verbal version (*in-/inw-*) (Larsen 1988: 237-238). The "object" of the perfect in (64-65) is actually the subject of a non-verbal predicate, marked with Set B agreement.

[57] Sansò (2016: 934) suggests a similar origin for the "object voice" construction in Rukai, an Austronesian language, which he interprets as deriving from a possessed patient nominalization.

Descriptions of the *-ooj/-uuj* participle in Poqom are consistent with this idea. The perfect participle is a nonverbal form; unlike other aspectual categories, it does not occur with TAM particles or proclitics. Further, colonial sources expressly talk about *-ooj* participles as patient nouns and show the progression that would lead to their reinterpretation as perfect aspect. Morán (1720) says the following about Poqomam:

> Y assi todos los que hacen, en. ari. mudado el. ari. en. oh.: su propria significacion es, cossa hecha, cossa vista. Dios es hacedor de todas las cossas visibles, e invisibles. Dios vanal re unche yloh, ma yloh. Suelesse hacer nombre este participio, y variarsse [sic] con las particulas possessiuas. nu vanoh. mi obra. oh ruvanoh Dios. nosotros somos hechura de Dios.
>
> And so all the [verbs] that end in [the passive suffix] *-ari* change *-ari* to *-oj*.[58] Its proper meaning is 'thing done', 'thing seen.' 'God is the maker of all things visible and invisible': *Dios b'anal re unche il-**oj,** ma il-**oj.*** Normally this participle makes a noun and varies with possessive particles: *nu-b'an-**oj*** 'my workmanship'; *oj ru-b'an-**oj** Dios* 'we are the creation of God' (Morán 1720: 14 [folio 7a], my translation and emphasis)

In the citation above, Morán clearly translates participles derived in *-ooj* as patient nouns: *il-**oj*** 'thing seen', *b'an-**oj*** 'thing done/made'. The fact that the participles can be possessed (as in *nu-b'an-**oj*** 'my workmanship') is further evidence that they are acting as nouns. However, Morán's examples also illustrate the context in which a patient noun could be reinterpreted as a marker of perfect aspect. I give his final example here, glossed:

[58] The manuscript does not indicate vowel length. In my translation, I standardized the Poqomam orthography but left the vowel length unspecified.

POQOMAM (Morán 1720: 14)
(67) *oj* *ru-b'an-**oj*** *Dios*
B1P A3S-do.make-PERF God
'we are the creation of God'

In fact, (67) parallels the K'iche' active perfect construction in (64). Just as Larsen suggests 'I have hit you' can be literally read as 'you are my one-who-has-been-hit', in (67) Morán's translation 'we are the creation of God' is semantically equivalent to 'God has created us': both express the "resultative perfect" meaning, the state of an entity resulting from a prior action (see section 1.4).

Stoll (1888) describes the same ambiguity in postcolonial Poqomchi':

> Die Bildungen auf *oj* gestatten indessen auch die Verbindung mit dem Pronomen possessivum *nu-ch'ab-uj* es ist mein Geschossenes, d. h. ich habe geschossen.
>
> The formations in *-oj*, however, also allow the attachment of the possessive pronoun: *nu-ch'ab'-uj* **it is my shot, i.e. I have shot** (Stoll 1888: 87, my translation and emphasis)

Stoll's example is glossed here.

POQOMCHI' (Stoll 1888: 87)
(68) *Ø* *nu-ch'ab'-uj*
B3S A1S-shoot-PERF
'I have shot [it]' (lit. 'it is my shot')

Another factor here comes from morphosyntax. In all examples that I have seen, such as in example (63) above, perfect participle *-ooj/-uuj* in Poqom occurs exclusively in a predicative position. I have never observed it acting as an attributive adjective within a

noun phrase, unlike the *-oom/-uum/-m* perfect of K'iche' (Larsen 1988: 235; see section 2.2.2) which speaks against the idea that *-ooj/-uuj* forms a deverbal adjective. Both nouns and adjectives can freely appear as non-verbal predicates, so it is entirely plausible that *qopooj* is a patient noun in (63), which would be translated as 'The candles are lit things because of you'.

All of the above suggests that the "perfect" *-ooj* in Poqomam and Poqomchi' is historically (and perhaps even synchronically) based on a patient noun. Crucially for the broader Mayan comparison, the Poqom perfect participle *-ooj/-uuj* should not be used as evidence for reconstructing the "perfect" meaning to proto-Central Mayan, because there is a clear pathway by which this meaning arose in Poqom. The next section accounts for how the patient reading originated from the action reading in the first place.

6.4.3. From action nouns to patient nouns in K'iche'an

The patient reading of *-ooj/-uuj* is only productive in Poqom, where it underlies the passive perfect participle, but the reading is attested in frozen forms in K'iche' and Kaqchikel, suggesting that proto-K'iche'an already had the seeds of an extension from action noun to patient noun.

Some frozen forms in K'iche' are also consistent with a patient noun reading (69). Larsen indicates that *-ooj* is only productive in the Nahualá and Santa Catarina Ixtahuacán, where it functions as an infinitive with the "action" reading. However, all varieties of K'iche' have frozen lexical nouns originally based on the *-ooj* suffix (Larsen

1988: 267-268). Some of these have strong "action" readings: in (69a-c), 'sowing of wheat', 'bullfight', and 'dance' can all be construed as referring to actions. Others refer to the patient of the action or an entity that results from that action: In (69d) *ch'ol-ooj* (from *ch'ol* 'to peel, skin') is translated as 'plowed land prepared for sowing wheat' (most likely in the sense that the top layer of soil is peeled off); this could be seen as a patient noun (the field that underwent the plowing) or as an entity that resulted from the action (the prepared field which has come into existence as a result of plowing). It is not translated as an action ('plowing'). Similarly, in (69e), *ch'ak-ooj* is translated not as an action 'earning money', but as the entity that is created by the process, the person's actual 'earnings'.

K'ICHE' (Larsen 1988: 267)

(69)				
	a.	*muq-uuj*	'sowing of wheat'	< *muq* 'to bury'
	b.	*tzur-uuj*	'bullfight'	< *tzur* 'to molest, to bull-fight'
	c.	*xoj-ooj*	'a dance'	< *xoj* 'to dance'
	d.	*ch'ol-ooj*	'plowed land prepared for sowing wheat'	< *ch'ol* 'to peel, skin'
	e.	*ch'ak-ooj*	'earnings'	< *ch'ak* 'to earn, to win (over)'

These are all frozen forms, and as Larsen indicates, their meanings are idiosyncratic and not fully predictable from the root (1988: 268). There is no evidence that *-ooj/-uuj* ever productively created patient or result nouns in K'iche'. However, these examples do show the result of the more productive "action" reading shifting to a patient or result reading.

Hartmann (2014) describes a similar process that happened with the *-ung* nominalizing suffix in German. Originally, *-ung* created nouns that transparently referred to the action of the verb (*grabung* 'the act of digging', *Lesung* 'the act of reading'). Over time, the meanings of many *-ung* nominals became more idiosyncratic and concrete, referring to specific bounded events (*Lesung* 'an event of reading', *Ausstellung* 'exhibition'), and even objects or people associated with the action (*Heizung* 'heating device', *Leitung* 'management/leader') (Hartmann 2014: 163).

Kaqchikel also has *-oj/-uj/-j* nominalizations with lexicalized meanings (70), in addition to the more productive infinitival use of the suffix. (70c-d) in particular have very patientive meanings, referring to the item that is earned or bought (note that 70c 'earnings' is cognate with 69e in K'iche').

KAQCHIKEL (García Matzar 2007: 31)

(70)	a.	*k'ut-uj*	'a request'	< DTV *k'ut-u-* 'ask for'
	b.	*ch'a'-oj*	'a sin, fault'	(unproductive root)
	c.	*ch'ak-oj*	'earnings'	< RTV *ch'ak-* 'to earn'
	d.	*loq'-oj*	'something bought'	< RTV *loq'* 'to buy'
	e.	*k'ay-i-j*	'sale, transaction'	< DTV *k'ay-i-* 'to sell'
	f.	*oq'-e-j*	'crying (n.)'	< DTV *oq'-e-* 'to cry sth.'

I suggest that **-ooj/-uuj* in proto-K'iche'an primarily referred to the action of the verb, the meaning inherited from proto-Central Mayan. Infinitival reflexes of the suffix in modern K'iche'an languages (including Poqom) preserve this meaning. However, frozen *-o(o)j* patient nouns in K'iche' and Kaqchikel suggest that proto-K'iche'an **-ooj/-uuj* was already polysemous between an "action" and "patient" reading, at least with some

individual lexical items. This completes the link between proto-Central Mayan and Poqom: Poqom later innovated by using *-ooj/-uuj* productively to create patient nouns, the usage that underlies the modern perfect participle.

6.4.4. From action nominalization to perfect aspect in Tseltalan

In Tseltalan (and, by extension, Tojol-ab'al; section 6.2.2.3), where reflexes of **-ooj/-uuj* also mark perfect aspect, there is not a clear progression from a nominalization to a perfect marker like there is in Poqom. Tsotsil *-oj* and Tojol-ab'al *-uj~-unej* appear to have only the perfect reading. Tseltal *-oj/-ej* primarily indicates perfect aspect, but *-oj* also semiproductively creates action nouns (33 repeated here as 71) (see section 6.2.2.5 above).

TSELTAL (Polian 2013: 462)
(71) *k'aj-**oj***
harvest-NOM
'harvest (n.), to harvest'

Again, based on the comparative evidence from K'iche'an and Q'anjob'alan, the action reading was clearly an original use of the suffix, even though it is no longer productive in Tseltalan. There is not strong evidence to reconstruct **-o-ej* to proto-Central Mayan as an active perfect marker; besides this, it would have competed with the **-o-'m* active perfect (section 4.3). The action nominalization must have become a perfect aspect marker in Tseltalan; here I discuss possibilities for how this could have happened.

One hypothesis is that Tseltalan underwent a change similar to Poqom, where the action nominalization *-*o*-*ej* first became a patient noun and was later reanalyzed as an active perfect aspect construction. However, there is no direct evidence for this sequence of events, unlike Poqom where all steps in the sequence are attested. Modern Tseltalan languages do not use -*oj*/-*ej* in passive contexts; -*b'il* is the passive perfect participle. Projecting the Poqom pathway of change onto Tseltalan implies that *-*o*-*ej* gained and then lost a patient noun reading on its way to becoming an active perfect marker, but we have no evidence of a patientive stage.

A second hypothesis is that the Tseltalan -*oj* perfect arose from contact with Poqom. This is unlikely, as they are geographically distant and have no other evidence of mutual contact.

A third hypothesis is that the action nominalization *-*o*-*ej* directly shifted to become the active perfect aspect marker in Tseltalan, without going through a passive stage. This is the simplest explanation but raises the question of how the perfect meaning arose. Kaufman states that the "active (perfect?) verbal noun" became the "perfect active" in Tseltalan and does not imply that it went through a passive stage, similar to this third hypothesis, but his analysis differs in that he suggests the original action nominalization had an associated perfect meaning already, without elaborating on what this meant for its contexts of use (Kaufman 2015: 319).

As a thought experiment, I illustrate a possible route in (72), showing different stages of proto-Tseltalan. (72a) shows an action nominalization *il-oj* 'seeing'. Possessing this nominalization with *k*- '1st person Set A' would yield 'my seeing' (72b). Tseltal

allows nouns to appear by themselves as predicates, often without an overt subject (73). Using the nominalization *k-il-oj* as a predicate would mean 'It is my seeing' (72c). If this predicate is interpreted as an existential statement 'my seeing exists' (72d), then this sets up the final step: to assert that the action exists is to say that it has been performed at least once, which is a use of perfect aspect (72e). Note that in this progression, the original incorporated object of the action nominalization is lost; instead, the subject of the non-verbal predicate is reinterpreted as the object of the perfect.

PROTO-TSELTALAN (Hypothetical)

(72)	a.	Stage 1:	**il-oj*	'seeing'
	b.	Stage 2:	**k-il-oj*	'my seeing'
	c.	Stage 3:	**k-il-oj*	'it is my seeing'
	d.	Stage 4:	**k-il-oj*	'my seeing exists'
	e.	Stage 5:	**k-il-oj*	'I have seen (it)'

TSELTAL (Polian 2013: 448)

(73) *Pukuj bi*[59]
demon PART
'It is a demon'

The progression in (72) is not airtight but suggests directions to look for potential intermediate stages. (72d) is the most conjectural, as I do not have direct evidence for Tseltal stative predicates acting as existential constructions; the latter normally use the existential-locative predicate *ay* 'there are/is' (Polian 2013: 623). (72b) is also anomalous, as I have no other examples of an *-ooj/-uuj* action noun appearing as a non-verbal predicate (see section 6.5 below). (110) below from Poqomchi' is a similar but not

[59] *bi* is a discourse particle that frequently appears at the end of a clause (Polian 2013: 757).

entirely parallel example where the action nominalization *nip'ojooj* 'my sewing' appears as the subject of an existential predicate (not as the predicate itself). Future detailed investigation of colonial Tseltalan manuscripts may provide more data about the distribution of the *-oj/-ej* suffix at an earlier stage, linking the action nominalization to the perfect meaning.

6.4.5. Summary of semantic change

To summarize this section, it is clear that in proto-Central Mayan, forms derived in **-ooj/-uuj* denoted the action described by the base verb. Cognates in K'iche'an languages suggest that **-ooj/-uuj* in proto-K'iche'an was beginning to develop a polysemy between action and patient noun readings. Even though the "perfect aspect" reading occurs in both Tseltalan and Poqom, it is clearly innovative in Poqom and not a retention, so this reading cannot be confidently reconstructed. I have also presented a possible route for how the action nominalization reading became a perfect in Tseltalan, which likely followed a slightly different trajectory from Poqom.

6.5. EXTERNAL SYNTAX

6.5.1. Overview of external syntax

In this section, I examine the external syntax of forms derived in *-ooj*: in other words, what syntactic category they behave as, with respect to the phrases that contain them (in

the terms of Haspelmath 1996). Internal syntax, or the expression of the argument structure of *-ooj* forms, will be dealt with in the next section (6.6). The goal of this section is to determine to what extent the proto-Central Mayan forms derived in **-ooj/-uuj* pattern like canonically nominal or verbal forms.

Table 24 below looks at four ways that the *-ooj*-derived form can relate to the verb phrase. Perfect forms in Poqom and Tseltalan can stand alone as predicates. In all the other languages, the *-ooj*-derived form is always a constituent of a verb phrase headed by another verb. Within these languages, I consider three possible positions that the form could occur in: as the object argument of the verb, as the subject of the verb (or of a non-verbal predicate), and elsewhere in the verb phrase (i.e. in a context that a noun could not appear).

Mayan languages allow both nouns and verbs to appear in the object position of a verb. In some Mayan languages, a fully inflected finite verb phrase can be the complement of a transitive verb, as in (74).

K'ICHE' (Larsen 1988: 390)

(74) *k=Ø=w-aaj* *k=in=b'ee-k*
INC-B3S-A1S-want INC-B1S-go-IV.SUF
'I want to go.' (lit. "I want I go")

I do not know of any examples in Mayan languages where unambiguously verbal forms appear as the subject of another verb (or non-verbal predicate). English allows non-finite clauses in this position, though it sounds archaic:

ENGLISH (self-constructed example)
(75) ***To finish the race quickly*** *is desirable.*

The last column covers cases where the *-ooj*-form occurs as an adjunct to the verb phrase and cannot be construed as the subject or object. If both the subject and object positions of the matrix verb are filled (or have a clear referent that is not the *-ooj*-form), then this indicates that the *-ooj*-form is doing something else. To illustrate this, I give the English example in (76a), where *blew* has both argument positions filled (subject *I*, object *the whistle*) and so *to distract them* must be acting as an adjunct (in this case, forming a purpose clause). Compare this to (76b) which shows that the noun phrase *(a) distraction* cannot appear in the same position. For a noun phrase to act as an adjunct in this way, it must be in a prepositional phrase (76c).

ENGLISH (self-constructed examples)
(76) a. *I blew the whistle loudly* ***to distract them.***
b. **I blew the whistle loudly* ***(a) distraction.***
c. *I blew the whistle loudly* ***as a distraction.***

In Table 24, "ND" (no data) indicates that the form is not attested in that position, but the grammar does not expressly rule it out. "No" indicates that the grammar specifically rules out that construction. Especially for the languages with less robust description, unattested forms could very well exist, but if all languages in a subgroup (or multiple grammars of a well-described language like K'iche') lack attestation of the construction, this suggests more strongly that it does not exist in those languages.

Branch	Language	Object of verb	Other nominal contexts	Adjunct	Main predicate
K'iche'an	K'iche'	Yes	Yes	ND	ND
	Achi	Yes	Yes		
	Kaqchikel	Yes	ND	ND	ND
	Tz'utujil	Yes	Yes	ND	ND
	Poqomam	Yes (infinitive)	ND	ND	Yes (perfect)
	Poqomchi'	Yes (infinitive)	Yes	ND	Yes (perfect) No (infinitive)
Q'anjob'alan	Q'anjob'al	Yes	Yes	Yes	ND
	Akateko	ND	Yes	Yes	ND
	Popti'	ND	ND	Yes	ND
	Chuj	No	Yes	Yes	ND
	Tojol-ab'al	ND	ND	ND	Yes
Tseltalan	Tseltal	ND	ND	ND	Yes (perfect)
	Tsotsil	ND	ND	ND	Yes
Ch'olan	Chol	ND	ND	ND	ND
	Ch'orti'	Yes	ND	ND	ND

Table 24: Positions where -*ooj*-derived forms can appear

Table 24 shows general patterns, the details of which I will elucidate in the next section (6.5.2). All subgroups allow the *-*ooj/-uuj* infinitive to appear as the direct object of a transitive matrix verb: this is the main pattern in K'iche'an languages, but is also attested in Q'anjob'al and with frozen forms in Ch'orti'. K'iche', Q'anjob'al, Akateko, and Chuj have isolated examples of the infinitive appearing in other canonically nominal contexts (subject, noun possessor, object of preposition). However, Q'anjob'alan languages most often use the infinitive to create adjunct clauses (specifically purpose clauses) that cannot be construed as an object or other core argument of the matrix verb.

Finally, outside of the infinitival uses, Poqom, Tseltalan, and Tojol-ab'al use reflexes of **-ooj/-uuj* as main predicates with a perfect meaning, an innovative usage that I have discussed in section 6.4.

6.5.2. Data

Examples (77-80) from Tz'utujil, Poqomchi', and Q'anjob'al show the *-oj*-infinitive acting as the direct object of a matrix verb meaning 'do' or 'begin'. (In 77 from Tz'utujil, the infinitive can even be optionally preceded by a definite article.) The Poqomchi' and Q'anjob'al sources I consulted did not include any simple transitive clauses with this pattern, but (78) and (79) show the infinitive phrase as a focused constituent and (80) as the response to a question. In each of these cases the constituent corresponds to the object of the 'do' verb.

TZ'UTUJIL (Dayley 1985: 393-394)

(77) *X-Ø-qaa-maj* ***(ja)*** ***choy-oj chee'***
COM-B3S-A1P-begin ART cut-INF tree
'We began to cut trees' or 'We began the cutting of trees'

POQOMCHI' (Mó Isém 2006: 216) (repeated from example 46 above)

(78) ***K'ot-oj papas*** *n-Ø-k-a'n,* *lahtz'* *ki-wach.*
dig-INF potatoes INC-B3S-A3P-do busy A3P-face
'They are digging potatoes, they are busy.'

Q'ANJOB'AL (Mateo Toledo 1998: 140; Mateo Toledo 2008: 440)

(79) *A* ***tx'aj-oj*** ***ch'en*** *chi-Ø y-un* *ix* *Katal*
FOC wash-INF car INC-B3 A3-do CLS Catarina
'Cleaning cars is what Catarina does.'

(80) Q. *Tzet* *chi-Ø* *h-one-j?*
what INC-B3S A2S-do-TV.SUF
'What are you doing?'

A. *Ten-oj* *aj* *lek-an* *awal.*
move-INF DIR standing-POS corn.plant
'Standing up corn plants that have fallen'
lit. 'Moving corn plants up standing.'

The Ch'orti' frozen form *niroj* 'healing prayer, curing rite' acts as a lexical noun and can appear as the object of a verb 'do' or 'give'.

CH'ORTI' (Hull 2016: 302, 426)

(81) *E* *winik* ***nir-oj*** *war* *u-che*
DET man heal-NOM PROG A3-do
'The man is performing a healing rite.'

(82) *E* *ixik* *tu'yokir tu'yokir* *uy-ajk'u* *ixin* ***e*** ***nir-oj***
DET woman truthfully A3-give go DET heal-NOM
'The woman wasted no time in giving a curation.'

Zavala (1992) does not show examples of the *-o* infinitive as the object of a transitive matrix verb in Akateko. Maxwell (1982: 167) states that in Chuj, *-oj* infinitives are used with intransitive matrix verbs, implying by omission that it does not appear as the object of a transitive verb.

In the majority of examples from Q'anjob'alan languages, the infinitival clause is subordinated to an intransitive verb of motion but does not fill a normal subject or object argument slot. Instead, it seems to be a secondary predicate, used as a purpose clause to indicate the purpose of the motion. In all three examples, an absolutive marker (*in/honh* 'I') references the subject of the matrix verb.

Q'ANJOB'AL (Mateo Toledo 2008: 293)

(83) *ch-in* *cheq-lay-toq* ***il-oj*** ***awal*** *y-uj* *hin-txutx...*
inc-B1S send-PAS-DIR see-INF corn.plant A3S-by A1S-mother
'I was sent to watch/take care of the cornfield by my mother...'

AKATEKO (Zavala 1992: 315)

(84) *x-in-jul* ***tzok'-o*** ***si'***
COM-B1S-come cut-INF firewood
'I came to cut firewood.'

POPTI' (Craig 1979: 145)

(85) *xk-ach to* ***il-o'*** ***qinh***
ASP-B2 go see-AP fiesta
'you went to watch the *fiesta*'

CHUJ (Maxwell 1982: 168)

(86) *Ø-honh-'el* ***poj-(o)j*** ***k'atzitz***
REC-A1-go.out split-INF firewood
'We went out to split firewood.'

Grammars of K'iche'an languages do not illustrate this secondary predicate usage. K'iche' and Achi *-ooj/-uuj* infinitives can appear as the object of a preposition to form a purpose clause, as discussed below (91-92), but they cannot directly modify the main verb as in Q'anjob'alan.

Even though Q'anjob'alan languages normally use *-oj*-infinitives in purpose clauses, there are other examples where they appear in straightforward nominal contexts. One example from Chuj shows the *-oj* infinitive acting as the subject of the main verb.

CHUJ (Maxwell 1982: 168)

(87) *x-Ø-laj-w* ***tz'ib'-(o)j*** ***hu'un***
COM-B3-end-AP write-INF paper
'Writing the letter ended.'

Similarly, Akateko allows the *-o* infinitive to appear as the subject of a non-verbal predicate. In (88), the predicate is *sa'al* 'good' and the subject is *tsoko te'* 'cutting trees.'

AKATEKO (Zavala 1992: 87)

(88) *texan* *sa'al-Ø* ***tsok-o te'***
possibly good-B3 cut-INF tree
'It might be good to cut trees.'

In Q'anjob'al, an *-oj*-infinitive can appear as a focused constituent, corresponding to the possessor of a noun in the main clause. In (89), *jun juloj no'* 'shooting animals' is understood as the possessor of *swatx'iloq* 'its goodness', and in (90), *jun achnoj unin ti* 'bathing children' is the possessor of *yelapnoq* 'its meaning'. This, along with the demonstrative elements in both phrases (the indefinite article *jun*, the demonstrative *ti* in 90), shows that the infinitive phrase in both examples (including its incorporated object) is acting as a noun phrase.

Q'ANJOB'AL (Mateo Toledo 1998: 140)

(89) *A* ***jun*** ***jul-oj*** ***no'*** *manxa s-watx'-il-oq*
FOC IND shoot-INF animal many A3-good-ABST-IRR
'Shooting animals is very good' (lit. 'Shooting animals, much is its goodness')

(90) *A* ***jun*** ***achn-oj*** ***unin*** ***ti*** *kawal miman y-elapn-oq*
FOC IND bathe-INF child DEM TNS big A3-mean-IRR
'Bathing children is very important' (lit. 'Bathing children, very big is its meaning')

Another nominal context where *-ooj*-infinitives can appear in K'iche'an languages is as the object of a preposition, once again more consistent with a nominal form. This usage is attested in (91) from K'iche', where *pa q'atooj* 'to harvest' is an adjunct to *xb'ee* 's/he went' and describes the purpose of the motion, like purpose clauses in Q'anjob'alan languages (though in Q'anjob'alan, the infinitive itself is the head of the purpose clause and is not the object of a preposition). (92) shows a similar purpose construction in Achi.

K'ICHE' (Larsen 1988: 420)

(91)	*X-Ø-b'ee*	***pa***	*q'at-ooj*
	COM-B3S-go	PREP	harvest-NOM

'S/he went to harvest wheat' (lit. 'S/he went to wheat harvest')

ACHI (Sis Iboy 2007: 85)

(92)	*X-Ø-e'-k*	*ri*	*a*	*Yaak*	***pa***	*tzuk-uuj*	*ib'ooy*
	COM-B3S-go-IV.SUF	DET	MASC	Yaak	PREP	seek-INF	armadillo

'Yaak went to search for armadillos.'

In (93a) from Tz'utujil, the prepositional phrase *chi tijoj tii'iij* 'to eat meat' modifies the motion verb *ok* 'enter' (used in the sense of 'begin'). In this case, the prepositional phrase is not a purpose clause (93a does not mean 'We entered in order to eat meat'). Passive action nominalizations, a different type of non-finite construction, can appear in the same syntactic frame (93b).

TZ'UTUJIL (Dayley 1985: 394)

(93) a.	*X-oq-ok*	***chi***	*tij-oj*	*tii'iij*
	COM-B1P-enter	to	eat-INF	meat

'We began to eat meat.'

b. *X-in-ok* ***chi*** *a-tz'e<j>t-iik*
COM-B1S-enter to A2S-see<PAS>-NOM
'I began to see you.'

Poqomchi' -$V_{R}j$ infinitives frequently appear as the object of the preposition *chi* when they are subordinated to *(k'ah)chi'*, the progressive auxiliary.

POQOMCHI' (Mó Isém 2006: 216)

(94) *Chi' k-eeb'* ***chi*** *tz'ir-ij* *wach* *maatz' pan* *kosina.*
PROG CL-B3P PREP strain-INF face atol PREP kitchen
'They are straining *masa* in the kitchen.'

6.5.3. Reconstruction

In K'iche'an languages, the *-ooj/-uuj* infinitive acts as a nominal form, which normally appears as the object of a matrix verb meaning 'do' or 'begin'. Q'anjob'al shares this context of use in examples such as (80). As it is present in both K'iche'an and Q'anjob'alan, this usage likely reconstructs to proto-Central Mayan. Examples like (87-90) from Akateko, Chuj, and Q'anjob'al, where the infinitive can appear as the subject of the sentence or as a possessor, are consistent with the idea that the infinitive is basically nominal.

In Q'anjob'alan languages, the most widespread use of the **-ooj/-uuj* infinitive is to form a purpose clause, usually subordinated to an intransitive motion verb. I have not seen *-ooj/-uuj* used in this way in K'iche'an languages. Poqomchi' has a similar construction that uses the agent nominalization *-ool/-uul*. In example (95), the agent

nominalization *ilol* ‘one who sees’ appears in a purpose clause *to see the sick person* (literally ‘the seer of the sick person’).

POQOMCHI’ (Mó Isém 2006: 217)

(95) *X-in-chaa* *il-**ol*** *yowaab’*
COM-B1S-come see-INF sick
‘I came to see the sick person’
(suggested literal translation: ‘I came (as) the seer of the sick person’)

Based on the data surveyed, proto-Q’anjob’alan **-ooj/-uuj* must have been able to appear in both contexts: the infinitive, fundamentally a nominal form, could also appear in secondary predicates to make purpose clauses. However, its use as the head of a purpose clause is limited to Q’anjob’alan languages, and so there is not enough evidence to positively reconstruct this usage to proto-Central Mayan.

As a final note, the above comparison focuses on the relationship of the **-ooj/-uuj* infinitive to the matrix verb. Another relevant dimension is whether the infinitive is more likely to be modified by verbal or nominal modifiers (or both) in a given language. Nominal modifiers include demonstratives, adjectives, numerals, and possession, while verbal modifiers include adverbs and directional postclitics, among others. (Note that I am here referring to words that modify the infinitive itself, not its object; I will discuss the latter in section 6.6 below.) The *-ooj/-uuj* infinitive in some K’iche’an languages can occur with or without a determiner, yielding slightly different translations (96). A determiner also appears with the Mocho’ *-eh* form in (58) above.

KAQCHIKEL (García Matzar and Rodríguez Guaján 1997: 457)

(96) a. *X-Ø-qa-chäp* ***ri*** *choy-oj* *che'*
COM-B3S-A1P-begin DET cut-INF tree
'We began the cutting of trees.'

b. *X-Ø-qa-chäp* *choy-oj* *che'*
COM-B3S-A1P-begin cut-INF tree
'We began to cut trees.'

A future study may compare possible modifiers that occur with the **-ooj/-uuj* infinitive across the family. This would provide added detail about the infinitive's distribution and to what extent it behaves as a nominal or verbal form.

6.6. INTERNAL SYNTAX

Most of the action nominalization reflexes of **-ooj/-uuj* can be followed by a bare noun that indicates a generic object of the action. Different sources refer to this construction as compounding, noun incorporation, or more formally, "Equi-NP Deletion" (Craig 1979), but these refer to the same construction, shown in the examples below. The generic-object construction is widespread and most likely reconstructs to proto-Central Mayan. However, the use of a generic object is not obligatory in all the descendant languages, and some allow more complex noun phrases to follow the infinitive. This section explores possible objects of *-ooj/-uuj* infinitives across the family to reconstruct whether the proto-Central Mayan infinitive took a bare object, no object, or if both constructions

were possible. I also briefly look at more complex objects that occur with the infinitive in modern languages, though there is not yet enough data to fill out this part of the picture.

6.6.1. Bare noun object

This section describes the presence or absence of an incorporated bare noun object with infinitival *-ooj/-uuj* in modern Mayan languages. Most examples of incorporation with the Mayan *-ooj/-uuj* infinitive resemble what Mithun (1984) calls "lexical compounding": unlike a noun that is acting as a full argument of the verb, which can refer to a specific entity, the incorporated noun usually represents a generic or typical object of the action, which combines with the verb semantically to describe a particular kind of event (e.g., English *berry-picking, mountain-climbing*). Because it refers to a generic object rather than a specific one, an incorporated noun generally does not accept demonstratives or definite articles, which would pick out a specific entity (Mithun 1984: 848).

In this section I focus on the infinitive, rather than the perfect constructions in Poqom, Tseltalan, and Tojol-ab'al, as the latter are much more permissive of full noun phrases as objects (see section 6.6.3). The data discussed in this section are summarized in Table 25 below.

Frozen **-ooj/-uuj* nominalizations like those found in K'iche', Tseltal, and Ch'orti' (30, 33 and 69 above) generally occur alone, without an object. I list these in Table 25 below, but because they are lexicalized, they do not give much information for the reconstruction. These forms could descend from productive **-ooj/-uuj*

nominalizations that occurred without an object, or they may have just lost the object when they became lexical nouns. Without other evidence, there is no way to tell.

In K'iche', only the Nahualá and Santa Catarina Ixtahuacán varieties use *-oj/-uj* (semi)productively as an action nominalization; these always occur with a bare noun object in what Larsen terms "phrasal compounds" (97).

K'ICHE' (Larsen 1988: 268)
(97) *ban-oj* ***sii'***
do-NOM firewood
'firewood making'

López Ixcoy and Sis Iboy's (2007) examples from K'iche' show the *-ooj/-uuj* infinitive with and without a bare object (98-99). Sis Iboy (2007) cites near-identical examples from Achi (100-101).

K'ICHE' (López Ixcoy and Sis Iboy 2007: 87)
(98) *X-Ø-b'ee* *ri* *a* *Yaak* *pa* *tzuk-uuj* ***ib'ooy***
COM-B3S-go DET MASC Yaak PREP seek-INF armadillo
'Yaak went to search for armadillos.'

(99) *X-e-b'e* *pa* *loq'-ooj.*
COM-B3P-go PREP buy-INF
'They went to buy.'

ACHI (Sis Iboy 2007: 85)
(100) *X-Ø-e'-k* *ri* *a* *Yaak* *pa* *tzuk-uuj* ***ib'ooy***
COM-B3S-go-IV.SUF DET MASC Yaak PREP seek-INF armadillo
'Yaak went to search for armadillos.'

(101) *X-e-b'ee* *pa* *loq'-ooj.*
COM-B3P-go PREP buy-INF
'They went to buy.'

Most Kaqchikel examples include the bare noun object (102-103). In example (104), *q'atoj* 'cutting wheat' does not occur with an object; nevertheless, as seen in the translation, the habitual patient (wheat) is still understood. The root *q'at-* seems to include the object as part of its meaning, so it may not be necessary to express the object overtly with this particular root.

KAQCHIKEL (García Matzar and Rodríguez Guaján 1997: 457, García Matzar 2007: 87)

(102) *X-Ø-qa-chäp* *choy-oj* ***che'***
COM-B3S-A1P-begin cut-INF tree
'We began to cut trees.'

(103) *Ri* *b'an-oj* ***jay*** *yalan* *k'atzinel*
DET do-INF house TNS necessary
'It is necessary to construct houses.'

(104) *X-Ø-qa-chäp* *q'at-oj*
COM-B3S-A1P-begin cut-INF
'We began to cut wheat.'

García Matzar (2007) gives examples where lexicalized *-oj/-uj/-j* nominalizations in Kaqchikel, like those in (70) above, occur without an object and modified by a numeral and adjective (105). (Note that *ch'a'-*, the root of *ch'a'oj* 'sin', is no longer attested in Kaqchikel; *ch'a'oj* is lexicalized and not a compositional use of the *-oj/-uj* infinitive.)

KAQCHIKEL (García Matzar 2007: 31)

(105) *Jun* *nimaläj* ***ch'a'-oj*** *x-Ø-u-b'än* *ri* *achi*
one very.big ?-NOM COM-B3S-A3S-do DET man
'The man committed a great sin.'

Dayley lists examples of Tz'utujil *-ooj* infinitives without an object (106), though none in a sentence. The available full-sentence examples always have an object, which Dayley notes is interpreted as indefinite[60] (1985: 181).

TZ'UTUJIL (Dayley 1985: 180, 393-394; García Ixmatá 1998: 125)

(106) a. *ch'ey-ooj* 'to hit'
b. *b'an-ooj* 'to make'
c. *tz'at-ooj* 'to see, look at'

(107) *X-Ø-qaa-maj* *(ja)* *choy-oj* ***chee'***.
COM-B3S-A1P-begin the cut-INF tree
'We began to cut trees.'

(108) *Ja* *b'an-oj* ***jaay*** *qas* *k'atziineel*
DET do-INF house TNS necessary
'It is necessary to construct houses.' (compare (103) above from Kaqchikel)

Mó Isém states that the *-V_Rj* infinitive cannot occur without an object in Western Poqomchi' (2006b: 216). Brown (1979), also writing about Western Poqomchi', lists forms that occur with and without an object: (109) in isolation, and (110) in a sentence. (110) is atypical in that *p'ojooj* 'sewing' is possessed; this use of *p'ojooj* may be more lexicalized and not a canonical use of the infinitive.

POQOMCHI' (Brown 1979: 44, 192)

(109) a. *yok'-ooj* 'to cut'
b. *yok'-oj* ***iib'*** 'to cut oneself'

[60] A topic for future semantic fieldwork could be the extent to which the incorporated object is truly generic (i.e. nonspecific) or merely indefinite, referring to specific entities that have not been previously defined in the context. Out of context, the free translation of (107) is compatible with both readings: generic ("We began (the action of) tree-cutting") and indefinite ("We began cutting (specific) trees").

(110) *Ku* *wilik* *ni-p'oj-ooj*.
still EXST A1S-sew-INF
'I still have sewing (to do).'

Poqomam "antipassive action nominalizations" (Smith-Stark 1983: 349) can occur with or without an object:

POQOMAM (SAN LUIS JILOTEPEQUE) (Smith-Stark 1983: 349; Malchic Nicolás et al. 2000: 272)

(111) a. *ch'uq-uuj* 'picking'
b. *ch'uq-uj* ***pix*** 'picking tomatoes'

(112) a. *'an-ooj* 'doing, making, building' (phonetically [ʔan-uaχ])
b. *'an-oj* ***paat*** 'house-building'

(113) *Tik-ooj* ***ab'iix*** *Ø-Ø-ru-'an* *ma'* *ak'un* *riyu'* *haab'*
sow-INF cornfield INC-B3S-A3S-do ART boy DEM year
'The boy did corn-planting all year.'

As an intermediate conclusion, Proto-K'iche'an must have allowed **-ooj/-uuj* to occur with or without a bare object, a state that is evidenced in multiple descendant languages. Phonological evidence weighs in here as well: as shown in section 6.3.2 above, multiple K'iche'an languages have a rule whereby a derivational suffix with a long vowel becomes short when an object follows. If proto-K'iche'an **-ooj/-uuj* infinitives could not occur alone (that is, they always occurred with an object), then the vowel of the suffix would always have been short, and speakers would have reanalyzed the form as simply having a short vowel all the time.

Q'anjob'al sources vary. Mateo Toledo (2008) states that the *-oj* infinitive in Q'anjob'al requires an incorporated object, as shown in the following pair of examples.

Q'ANJOB'AL (Mateo Toledo 2008: 263)

(114) a. *Max-in* *toj* *[tzok-oj* ***sii']***
COM-B1S go cut-INF firewood
'I went to cut firewood.'

b. **Max-in* *toj* *[tzok-oj]*
COM-B1S go cut-INF
Intended: 'I went to cut (something).'

However, the ALMG descriptive grammar (CLQ 2005) shows examples without an object. In (115), *kuyoj* 'study' forms part of a phrase *yatutal kuyoj* 'school/house of study', which may be a lexicalized use; in (116), *kuyoj* forms a purpose clause '(in order) to study', which is more clearly infinitival. I am uncertain whether the discrepancy between Mateo Toledo and CLQ on this point is due to dialectal variation, errors in the data, or some more subtle grammatical condition.

Q'ANJOB'AL (CLQ 2005: 139, 203)

(115) *Chi-Ø* *toj* *naq* *unin* *b'ay* ***y-atut-al*** ***kuy-oj***
INC-B3 go CL.man boy in A3-house-POSS study-INF
'The boy is going to school'

(116) *Chi-Ø* *toj* *q'o* ***kuy-oj***
INC-B3 go PRO.her study-INF
'She is going to study.'

As a side note, Q'anjob'al also allows double-verb infinitives as shown in (117). In this construction, the first verb takes the infinitive *-oj* suffix, and the nominal object appears after the second verb (117a). *-oj* cannot attach to the second verb (117b). Mateo Toledo indicates that in (117a), the second verb (*koj*) would be expected to take the *-oq*

intransitive dependent suffix, except that *-oq* disappears phrase-medially; in other words, *koj(-oq)* is acting as a secondary predicate to *q'aqoj* 'cutting'.

Q'ANJOB'AL (Mateo Toledo 2008: 263)

(117) a. *Max-on* *b'et-ik'* *hon* *[q'aq-**oj*** *koj* *te'-ej*[61]*]*
COM-B1P go.return-DIR EXCL cut-INF grind tree-ABS
'We went to destroy trees by cutting them.'

b. **Max-on* *b'et-ik'* *hon* *[q'aq* *koj-**oj*** *te'-ej]*
COM-B1P go.return-DIR EXCL cut grind-INF tree-ABS
Intended: 'We went to destroy trees by cutting them.'

Maxwell says that in Chuj "[t]he infinitive option is *often* chosen when the second verb appears with an habitual object" (1982: 167, my emphasis). From her description it is not clear to me whether the object is obligatory. I have not seen any naturally occurring examples that omit it, but Maxwell cites (119) with parentheses around the object, indicating that it is optional.

CHUJ (Maxwell 1982: 168)

(118) *Ø-honh-'el* ***poj-j***[62] ***k'atzitz***
REC-A1-go.out split-INF firewood
'We went out to split firewood.'

(119) *x-Ø-laj-w* *tz'ib'-j* ***(hu'un)***
COM-B3-end-AP write-INF paper
'writing the letter ended'

[61] Some nouns in Q'anjob'al (and other Mayan langauges) take a suffix in their unpossessed form, which is lost when the noun is possessed (CLQ 2005: 91). The root *te* 'wood' does not occur alone as a lexical noun. Thus, despite being morphologically complex, *te'ej* plays the same role here as a bare noun.

[62] Maxwell lists the suffix as *-oj* in the morphological breakdown of (118) and (119), but the /o/ vowel is elided.

As discussed in section 6.2.2.2 above, Popti' and Awakateko infinitives use an innovative *-o'/-u'* suffix derived from the transitive irrealis, but these retain a very similar distribution to *-oj/-uj* infinitives in other Q'anjob'alan languages, so that they are worth comparing here. Popti' and Akateko infinitives occur with a generic object (120-121). In both languages, the incorporated object is a defining feature of the infinitive construction: Craig calls the Popti' *-o'* infinitive an "incorporating antipassive" (Craig 1979: 145) while Zavala glosses Akateko *-o* as "transitive infinitive with object" (1992: 85, my translation).

POPTI' (Craig 1979: 145)

(120) a. *il-o'* ***q'inh***
see-INF fiesta
'to watch the fiesta'

b. *kol-o'* ***ánma***
help-INF person
'to help people'

AKATEKO (Zavala 1992: 87)

(121) *txi-Ø-too* *eb'* *naj* *jul-o* ***no'***
INC-B3-go CL3P PRO.man hunt-INF animal
'they go to hunt animals'

In Akateko, Peñalosa states that the *-o* transitive infinitive sometimes occurs with intransitive verbs instead of the expected *-oj* (<*-*oq*) intransitive dependent suffix (1987: 308), in which case it does not take a bare object. If this *-o* is truly the transitive infinitive (and not just the intransitive *-oj* with the final fricative elided), its appearance with

intransitive verbs is innovative; no other Mayan language has this. In all full-sentence examples I have seen with transitive roots in Akateko, *-o* takes a bare object.

AKATEKO (Peñalosa 1987: 309)
(122) *texan ch=(j)ax jul o'-o* (or *o'=oj*)
why ASP=A2 come cry-INF (or cry=DEP)
'Why do you come to cry?'

In Q'anjob'alan languages, it is clear that the normal use of the *-oj/-uj* transitive infinitive is to incorporate a bare noun object. Q'anjob'al has examples of the *-oj/-uj* infinitive without an object, and Maxwell (1982) hints that the object is optional in Chuj, but the vast majority of examples include the object in both languages. In Akateko and Popti', there is no indication that the *-o'/-u'* infinitive can occur without an object (except in rare cases such as (122) where the suffix appears on an intransitive verb).

Table 25 summarizes the data described above about objects of the *-ooj/-uuj* infinitive. "ND" ("No data") in a cell means there is no evidence for or against that usage; "Maybe" indicates that the evidence is unclear. Once again, this table focuses on the infinitive and action nominalization reflexes, rather than the perfect reflexes.

Branch	Language	No object	Bare noun
K'iche'an	K'iche'	Yes (frozen)	Yes
	Achi	Yes	Yes
	Kaqchikel	Yes	Yes
	Tz'utujil	Yes	Yes
	Poqomam	Yes	Yes
	Poqomchi'	Yes	Yes
Q'anjob'alan	Q'anjob'al	Yes	Yes
	Akateko	No	Yes
	Mocho'	ND	Yes
	Popti'	No	Yes
	Chuj	Maybe	Yes
Tseltalan	Tseltal	Yes (frozen)	No
Ch'olan	Chol	ND	ND
	Ch'orti'	Yes (frozen)	ND

Table 25: Types of objects that may appear with *-ooj* transitive action nominalizations.

As seen in the above table, all K'iche'an and Q'anjob'alan languages allow the *-ooj/-uuj* infinitive to incorporate a bare noun, which represents a generic object of the verb. Sources in both subgroups show examples where *-ooj/-uuj* occurs by itself without an object, but in all cases, this seems to be the less common usage, and is often limited to lexicalized forms. Because both usages are widely attested, the proto-Central Mayan **-ooj/-uuj* infinitive could likely occur with or without an object, but based on the ubiquity of the bare-noun construction in descendant languages, I suggest that this was the primary usage.

6.6.2. More complex NPs

In this section, I look at instances where an *-ooj* form takes a more complex noun phrase as an argument—one modified by a determiner, adjective, or other nominal modifier—rather than just incorporating a bare noun. These examples are relevant to discussing the verbal or deverbal nature of the infinitive. If *-ooj* can only be followed by a bare noun, this suggests that it may simply be forming noun-noun compounds, but if it can select for a full noun phrase, then it is maintaining some of the argument structure of its transitive root. While examples of complex NP objects of *-ooj* are attested across the family, they are fairly scarce in descriptions, and most secondary sources do not call attention to these examples or delimit what modifiers are possible. Thus, this section will be only a general survey; future corpus work could more thoroughly identify what modifiers are possible in each language.

In (123) from Tz'utujil, the object can be preceded by the numeral *jun* 'one', acting as an indefinite article, to clarify that the action was done to one dog. There is not enough information about the context to determine whether *jun tz'i'* picks out one specific dog as the object or simply denotes the (generic) act of hitting a single dog (compare English *It's bad to hit a dog* which is normally understood as a generic statement; picking out a specific dog by asking *#Which one?* is infelicitous on the intended reading). Dayley gives no examples of the infinitival object with a definite article; compare (124) where the notional patient (and grammatical possessor) of the

passive action nominalization *rch'ejyiik* 'being hit' can take either the indefinite article *jun* or definite article *ja.*

TZ'UTUJIL (Dayley 1985: 41)

(123) a. *ch'ey-oj* ***tz'i'***
hit-INF dog
'to hit dogs' (or 'dog-hitting' -JT)

b. *ch'ey-oj* ***jun*** ***tz'i'***
hit-INF one dog
'to hit a dog'

(124) a. *r-ch'e<j>y-iik* ***tz'i'***
A3S-hit<PAS>-NOM dog
'for dogs to be hit'

b. *r-ch'e<j>y-iik* ***jun*** ***tz'i'***
A3S-hit<PAS>-NOM one dog
'for a dog to be hit'

c. *r-ch'e<j>y-iik* ***ja*** ***tz'i'***
A3S-hit<PAS>-NOM ART dog
'for the dog to be hit'

In some Poqomchi' examples, -$V_R j$ infinitives and their objects can be separated by relational nouns derived from body parts, such as *paam* 'stomach' or *wach* 'face', which have prepositional meanings. In other situations, a relational noun will be "possessed" by the notional object of the preposition and take Set A prefixes for possessor agreement. *paam* and *wach* in (125) and (126) do not take possessor agreement, suggesting that they are being treated as true prepositions in these examples. Thus, *paam huuj* 'in the book(s)' and *wach maatz'* '(at) the corn dough' should be considered prepositional phrases.

POQOMCHI' (Mó Isém 2006: 216, 2007: 42)

(125) *Re' k-eh q'e' suq k-eh i juch'-uj* ***paam*** *huuj*
DET A3P-RN very sweet A3P-RN ART scribble-INF stomach book
'They enjoy scribbling in their notebooks.'

(126) *Chi' keeb' chi tz'ir-ij* ***wach*** *maatz' pan kosina.*
PROG CL-B3P PREP strain-INF face atol PREP kitchen
'They are straining corn dough in the kitchen.'

Poqomam allows possessed relational nouns as the object of an infinitive, including the reflexive *-iib'* and the "dative" *-eh* (127) (compare 109 above from Poqomchi', which has the bare reflexive noun *iib'* without a possessor). The objects in (127) are both unusual in that they seem to pick out a specific individual rather than a generic kind of object. In the available examples, the relational noun always takes third person singular agreement; it is unclear whether this construction is productive with all combinations of person and number. It is also unclear if a relational noun with a prepositional meaning as in (127b) can appear with an overt possessor, the notional object of the preposition; Smith-Stark gives these examples in isolation, outside of a sentence context.

POQOMAM (Smith-Stark 1983: 349)

(127) a. *tok-oj* ***r-iib'***
hit-INF A3S-REFL
'hitting himself'

b. *tz'aj-oj* ***r-eh***
wash-INF A3S-RN.to
'washing it'

(128) is an interesting case in that *tikooj* 'sowing' seems to be possessed by the topicalized agent (*lo ma' ak'un* 'the boy'. The object (*ma' ab'iix* 'the milpa') includes the definite article *ma'* (Smith-Stark 1983: 518)[63] and refers to a specific object (one particular field), meaning that it is not "incorporated" under Mithun's (1984) definition.

POQOMAM (SAN PEDRO PINULA) (Malchic Nicolás et al. 2000: 271-272)

(128) *Lo ma' ak'un Ø-Ø-qehp-a ru-tik-ooj ma' ab'iix ture'*
DET ART boy COM-B3S-begin-IV A3S-sow-INF ART milpa ADV
'The boy began sowing the cornfield' (lit. 'The boy, his sowing of the milpa began' -JT)

In Chuj, the infinitive phrase can contain a demonstrative (129). However, it is unclear in (129) whether *chi'* is modifying the object *kape'* or the whole infinitive phrase.

CHUJ (Buenrostro Díaz 2013: 134)

(129) *tz=Ø=b'at winh* [*mol-oj kape* ***chi'***]
HAB=B3=go CL.male grind-INF coffee DEM
'He is going to grind coffee.'

Example (80) from Q'anjob'al, repeated here as (130), shows a more complex string of constituents following *tenoj* 'moving'. *aj* 'up' is a postverbal directional particle, and Mateo Toledo's literal translation indicates that the positional predicate *lekan* 'standing' is a secondary predicate modifying *tenoj*, not an attributive modifier of the

[63] Smith-Stark distinguishes "determiners" from "definite articles" in Poqomam (1983: 524). Both can appear simultaneously with definite noun phrase, seen with *lo ma' ak'un* 'the boy' in (128).

object noun *awal* ‘corn plant’. Mateo Toledo elsewhere in the same work (2008: 429ff.) describes the Q’anjob’al construction whereby positionals can act as secondary predicates to verbs: in (131), *nilan* ‘grouped’ is a secondary predicate modifying the action of the verb *xjay…heb’* ‘they came’. Thus while (130) may not show a complex NP, it is evidence that the *-oj*-infinitive still permits verbal modifiers.

Q’ANJOB’AL (Mateo Toledo 2008: 429, 440)

(130) Q. *Tzet* *chi-Ø* *h-one-j?*
what INC-B3S A2S-do-TV.SUF
‘What are you doing?’

A. *Ten-oj* *aj* ***lek-an*** *awal.*
move-INF DIR standing-STAT corn.plant
‘Standing up corn plants that have fallen’
lit. ‘Moving corn plants up standing.’

(131) *Axa* *b’ay-tu xin* *x-Ø-jay* ***nil-an*** *heb’.*
PART at-DEM TNS COM-B3S-come group-STAT 3P.PRO
‘It is there where they came [and stayed] grouped.’

According to Craig (1979), Popti’ does not allow the object noun to occur with determiners, but it can occur with adjectives that “express inherent or predictable characteristics” of the noun; she does not provide examples of these (Craig 1979: 146). While this does represent a more complex noun phrase, it fits the default pattern described above in section 6.6.1, where the object of the infinitive tends to be nonspecific.

As seen above, the *-ooj/-uuj* infinitive can take more complex complements in some Mayan languages, but the available examples do not show a consistent pattern. The

Tz'utujil infinitive can take objects with indefinite articles (but apparently not definite articles), while Poqomam permits definite objects marked by definite articles or possession. A preposition can introduce the object of the infinitive in Poqomchi'. Popti' allows prenominal adjectives, though limited to a generic meaning. Lack of data makes it impossible to reconstruct the proto-Central Mayan pattern; future targeted fieldwork may rigorously establish the types of complements that each language allows. I predict that most languages will have a similar constraint as in Popti', where modifiers can only describe "inherent or predictable characteristics" of the object (Craig 1979: 146). This would be consistent with the overall observation that the object of the transitive infinitive is incorporated and interpreted as generic.

6.6.3. Arguments of perfect constructions

In constrast to *-ooj/-uuj* infinitives, perfect constructions in Tseltalan languages, Tojol-ab'al, and Poqom can take arbitrarily complex noun phrases as objects, as in example (132).

TSELTAL (Polian 2013: 167)

(132)	[*j*]-*Jelbin-ej-tik*	***te***	***ch'in***	***axux=e***
	A1-put.in.satchel-PERF-1PL	DET	DIM	garlic=DET
	'We put the garlic in the satchel.'			

I have argued above in 6.4.2 and 6.4.4 that these perfect constructions are innovative. A possessed **-ooj/-uuj* nominalization started to be used as a non-verbal predicate; the

subject of the non-verbal predicate was reinterpreted as the object in a perfect construction, while the possessor was reinterpreted as the agent (*nuch'ab'uj* 'It is my shot' > 'I have shot it' in 68 above). In my analysis, the "object" of the perfect construction does not correspond to the former incorporated object of the **-ooj/-uuj* nominalization; it is a different constituent and is not subject to the same constraints. Instead, my analysis predicts that any NP constituent that could form the subject of a non-verbal predicate should now be a possible object of the innovative perfect construction.

6.6.4. Summary of internal syntax

In this section I have argued that proto-Central Mayan **-ooj/-uuj* infinitives could occur in isolation or incorporating a bare noun as a generic object, though the latter was probably the more common construction. The modern descendant languages vary as to whether or not the incorporated object is required. Poqom, Tseltalan, and Tojol-ab'al, where this infinitive became a perfect aspect marker and can now occur as a matrix predicate, innovated the most in that they now select for arbitrarily complex full noun phrases as objects.

Future fieldwork or corpus work should thoroughly investigate the types of modifiers that can occur with infinitival objects in each descendant language. The preliminary evidence surveyed here suggests that the object of the proto-Central Mayan **-ooj/-uuj* infinitive did accept modifiers, but probably only those that were consistent

with a generic reading for the object, clarifying the kind of action that is in view but not specifying individual objects.

6.7. CONCLUSION

In this chapter, I have given evidence for the form and distribution of the **-ooj/-uuj* infinitival suffix in proto-Central Mayan. I have argued that with transitive roots, the form should be reconstructed as **-ooj/-uuj*, probably shortening to **-oj/-uj* when an object followed the infinitive. There is weaker evidence for a corresponding **-j* or **-ej* suffix with derived transitive verbs, though this still requires more study.

I have shown that the basic function of **-ooj/-uuj* in proto-Central Mayan was to create a deverbal form referring to the action described by the verb. In proto-K'iche'an, a patient noun reading may have been available with certain roots, preserved in Poqom and in unproductive reflexes in K'iche' and Kaqchikel. Tseltalan and Poqom innovated perfect aspect constructions based on **-ooj/-uuj*; this usage does not reconstruct to pCM.

Syntactically, the **-ooj/-uuj* infinitive is basically nominal and could appear as the object of a verb meaning 'do', a usage that survives in all K'iche'an languages and in Q'anjob'al. All Q'anjob'alan languages can use the infinitive as the head of a purpose clause subordinated to a motion verb; there is not sufficient evidence to reconstruct this usage to pCM, but I have not ruled out that it is a retention that was lost in K'iche'an. With respect to the infinitive's own argument structure, I have shown that the **-ooj/-uuj*

infinitive usually occurred with a bare noun referring to a generic object (noun incorporation) but could also probably occur alone, without an object. More data is necessary to determine whether the pCM infinitive could take verbal modifiers or more complex objects.

Because the reflexes of **-ooj/-uuj* have such widely varying functions across the family, its history interacts not only with that of perfect marking, but with the history and typology of subordinate clauses in Mayan languages (Aissen 1987, 2017; England 1989, 2013). Future work may integrate the findings of this chapter into a larger study of the diachrony of subordinate clause structures, showing how the functional load of each construction has changed. For example, the fact that **-ooj/-uuj* infinitives head purpose clauses only in Q'anjob'alan languages raises the question of how other Mayan languages construct purpose clauses, and how the expression of this category has changed over time. Such questions underscore the main takeaway of this chapter, which is that the detailed diachronic study of a single grammatical construction (in this case, the **-ooj/-uuj* infinitive) is crucial in order to understand how it fits into the larger grammatical system (in this case, the paradigm of perfect marking and the system of subordinate clauses).

Chapter 7: Conclusion

7.1. Overview: Putting the pieces together

In the preceding chapters, I have discussed the various perfect constructions seen across Mayan languages and offered an account for their origin, changes in their distribution and function, and areal borrowing. This chapter puts the pieces together to show how the form of the Mayan perfect changed from proto-Mayan into the descendant languages. I also outline broader takeaways and avenues for future research.

Section 7.2 compiles and summarizes my analysis of the proto-Mayan perfect paradigm and how it evolved into each of its descendant languages, including intermediate stages. Section 7.3 outlines contributions of this research for Mayan linguistics and the study of historical morphology in general. Section 7.4 discusses ways to expand this analysis, both by looking at perfect constructions in more detail and by relating the perfect to the wider derivational paradigm.

7.2. Evolution of the Mayan perfect paradigm

In chapters 3 and 4, I argued that proto-Mayan had the perfect paradigm shown in Table 26 below. Intransitive verbs used the perfect participle suffix **-i-naq* (section 3.1.1) while transitive verbs used the suffix **(-o)-'m* in both active and passive perfect

constructions (sections 4.3-4.4). As I argued in section 4.4.3, the active transitive perfect was synchronically based on the passive perfect, which was underlyingly a patient noun. In this section, I assemble the full picture of how the form of the perfect changed across time in Mayan languages. Table 26 shows the evolution of the perfect paradigm from proto-Mayan into its immediate descendants, based on my analysis in the previous chapters.

Language	IV	Active		Passive	
		RTV	DTV	RTV	DTV
Proto-Mayan	*-*i*-*naq*	*-*o*-*'m*	*-*'m*	*-*o*-*'m*	*-*'m*
Proto-Wastekan	*-*e*-*neq* (or *-*e*-*nek*)	?	?	?	?
Proto-Yucatecan	***-a'an, -V_Rl, -en*** (<Ch'olan)	*-*m*-***aj***	*-*m*-***aj***	***-b'il*** (<WM), ***-a'an***	***-b'il*** (<WM), ***-a'an***
Proto-Central Mayan	*-*i*-*naq*	*-*o*-*'m*[64]	*-*'m*	*-*o*-*'m*	*-*'m*

Table 26: Reconstruction of the perfect paradigm in Proto-Mayan and its immediate descendants. Innovative suffixes are bolded.

In Wastekan, intransitive perfect *-*i*-*naq* underwent a vowel change to become *-*e*-*neq* (apparently an irregular sound change). Both Teenek and Chicomuseltec underwent the Lowland **q>k* sound change (Law 2014: 42), producing -*e*-*nek*. Norcliffe (2003: 67) places the **q>k* sound change in proto-Wastekan, but she does not account for

[64] As discussed in section 4.2.1.2, a rule can be reconstructed at least to proto-Central Mayan where /o/ in a derivational suffix normally harmonizes with /u/ in a root. For visual simplicity and to avoid redundancy, I have not represented *o/u* harmony in this and the following tables.

the fact that **q>k* is an areal sound change (Law 2014: 42), which could have affected Wastekan languages either before or after they separated from one another. Depending on the timing of the **q>k* change, Proto-Wastekan may have had **-e-neq* or **-e-nek*.

In Teenek, the transitive perfect suffix **-o-'m* became *-aam*; I am unsure what led to the change in vowel quality. *-aam* takes additional suffixes to distinguish voice (active *-al*, passive *-ej*, antipassive *-ath*). The available documents in Chicomuseltec have no data about transitive perfect marking, so it is unclear whether these forms first appeared in proto-Wastekan or only later in Teenek, and because there are no remaining Chicomuseltec speakers, this question may be unanswerable. Thus, I have left the proto-Wastekan transitive perfect markers unspecified in Table 26.

Note that even though proto-Yucatecan was one of the first groups to split off from proto-Mayan, the breakup of Yucatecan into its four descendants was fairly recent (1,000 years before present, per Kaufman's 1976a estimate), reflected in how little Yucatecan languages have diverged from one another. Table 26 shows Proto-Yucatecan in its late form. By this point, proto-Yucatecan had added the **-aj* completive suffix to the transitive perfect to make **-m-aj* (section 5.4), borrowed **-b'il* from Western Mayan (section 4.4), possibly borrowed **-en* from Ch'olan-Tseltalan **-eem~-een* (section 3.1.2.1), recruited **-a'an* as an intransitive and passive participle suffix (section 3.1.3), and began using the stative participle suffix **-V_Rl* with intransitive verbs, possibly as a result of Ch'olan-Tseltalan influence (sections 3.1.4 and 4.2.4.4). The innovation of **-m-aj* likely took place before the recruitment of **-a'an*, because when they occur in the

same word, the latter appears farther from the root, and **-a'an* has much more free attachment (section 3.1.3), but I do not have evidence for the order of the other changes.

Table 27 shows changes that took place within Yucatecan. Mopan lost active perfect marking. The Lacandon active perfect became *-m-an~-m-än*, probably a contraction of *-m-aj-a'an* (Hofling 2006: 376; see section 5.4), while the Lacandon passive perfect *-b'il* became *-b'ir* in Southern Lacandon by a regular sound change (Hofling 2017: 705).

Language	IV	Active		Passive	
		RTV	DTV	RTV	DTV
Proto-Yucatecan	**-a'an, *-V_Rl, *-en*	**-m-aj*	**-m-aj*	**-b'il, *-a'an*	**-b'il, *-a'an*
Yucatec	*-a'an, -V_Rl, -en*	*-m-aj*	*-m-aj*	*-b'il, -a'an*	*-b'il, -a'an*
Itzaj	*-a'an, -al*	*-m-aj*	*-m-aj*	*-b'il, -a'an*	*-b'il, -a'an*
Mopan	*-a'an, -V_Rl, -en*			*-b'il, -a'an*	*-b'il, -a'an*
Lacandon	*-a'(a)n*	*-m-**an** ~ -m-**än***	*-m-**an** ~ -m-**än***	*-b'il ~ -b'äl ~ -b'ir, -a'an*	*-b'il ~ -b'äl ~ -b'ir, -a'an*

Table 27: The perfect paradigm in Yucatecan languages.

Proto-Central Mayan retained the proto-Mayan paradigm. Table 28 shows the separation of Central Mayan into Western Mayan and Eastern Mayan. Western Mayan in turn splits into Q'anjob'alan and Ch'olan-Tseltalan, while Eastern Mayan splits into Mamean and K'iche'an.

Language	IV	Active		Passive	
		RTV	DTV	RTV	DTV
Proto-Central Mayan	*-*i-naq*	*-*o-'m*	*-*'m*	*-*o-'m*	*-*'m*
Proto-Western Mayan	*-*i-naq*			***-b'-Vl***	***-b'-Vl***
Proto-Q'anjob'alan	*-*i-naq*			*-*b'-Vl*	*-*b'-Vl*
Proto-Ch'olan-Tseltalan	***-eem ~-een***			*-*b'il*	*-*b'il*
Proto-Eastern Mayan	*-*i-naq*	*-*o-'m*	*-*'m*	*-*o-'m*	*-*'m*
Proto-Mamean	*-*naq*			*-*o-'m*	*-*'m*
Proto-K'iche'an	*-*i-naq*	*-*oom*	*-*V_1m*	*-*oom*	*-*V_1m*

Table 28: The perfect paradigm in proto-Central Mayan and its immediate descendants. Innovative suffixes are bolded.

Proto-Western Mayan lost active perfect forms altogether and innovated **-b'-Vl* as the new passive perfect participle. Strictly speaking, as I have discussed in section 4.2.2.1, **-b'-Vl* could have been innovated later and spread to other Western Mayan languages by contact in the Lowland Mayan linguistic area, but this does not explain its presence in Mocho' which does not have other evidence of Lowland Mayan contact. In either case, every Western Mayan language now has a reflex of **-b'-Vl* (*-b'il* in all languages but Tojol-ab'al and Mocho'). Proto-Q'anjob'alan is identical to proto-Western Mayan.

Proto-Ch'olan-Tseltalan repurposed the proto-Central Mayan intransitive action nominalization **-e-'m* as a new perfect participle **-eem* (varying to **-een* to dissimilate from a stem ending in a bilabial consonant; see section 3.1.2.2). If one follows MacLeod (2004) in considering the Classic Mayan *-Vj* suffix a perfect marker, then proto-Ch'olan-Tseltalan could also be reconstructed with **(-o)-ej* as an active transitive perfect marker,

an extension of the proto-Central Mayan *-*ooj/-uuj* action nominalization. Positing this innovation in proto-Ch'olan-Tseltalan does have an appealing structural symmetry: it implies that both the intransitive and transitive gerunds shifted to become perfect participles at the same time. However, Robertson et al. (2004) consider the Classic Mayan -*Vj* suffix an action nominalization, not a perfect, which would imply that the extension of *-*ooj/-uuj* to perfect contexts cannot be confidently reconstructed any earlier than proto-Tseltalan (see Table 30). As discussed in section 6.2.2.5, the analysis of -*Vj* as an action nominalization in proto-Ch'olan-Tseltalan is more consistent with modern Ch'olan languages, which use the suffix in unproductive action nominalizations, so I do not list it as a perfect in Table 28.

Proto-Eastern Mayan retained the proto-Mayan paradigm. Proto-Mamean lost active perfect forms but retained **(-o)-'m* as a passive perfect participle; proto-Mamean also extended **(-o)-'m* to become an infinitival suffix (section 4.2.1.1). Proto-K'iche'an kept the proto-Eastern Mayan paradigm but deleted the preconsonantal glottal stop in **(-o)-'m* as a regular sound change, leading to compensatory lengthening of the preceding vowel. With RTVs this created the form *-*oom/-uum*, while with DTVs that have a variable stem vowel, the perfect suffix lengthens the preceding stem vowel (represented here as -V_1m).

Table 29 shows the changes that occurred to the perfect paradigm in Q'anjob'alan languages.

Language	IV	Active		Passive	
		RTV	DTV	RTV	DTV
Proto-Q'anjob'alan	*-*i*-*naq*			*-*b'*-*Vl*	*-*b'*-*Vl*
Q'anjob'al	-*naq*			-*b'il*	-*b'il*
Akateko	-*naj*	***-b'il***	***-b'il***	-*b'il*	-*b'il*
Popti'	-*naj*			-*b'il*	-*b'il*
Mocho'	-*naq*	ND	ND	-*ob'aal*	-*ob'aal*
Chuj	-*nak*	***-nak***	***-nak***	-*b'il,* ***-nak***	-*b'il*
Tojolab'al	-*el*	***-unej ~ -uj***	***-unej ~ -uj***	-*ub'al*	-*ub'al*

Table 29: The perfect paradigm in Q'anjob'alan languages.

Core Q'anjob'alan (Q'anjob'al, Akateko, Popti) and Mocho' largely retained the proto-Q'anjob'alan paradigm. Akateko extended passive -*b'il* to fulfill the role of the active perfect (section 4.2.2.3). Intransitive perfect -*nak* can appear in active and passive transitive contexts (sections 3.1.1.2 and 4.2.5.1). The -*naq* suffix underwent phonological changes in Akateko and Popti' (where **q>j* word-finally) and Chuj (which underwent the Lowland **q>k* sound change) (section 3.1.1.3). I discuss the phonological changes to **-b-Vl* in Mocho' below.

Tojol-ab'al is a mixed language that incorporates features of Chuj and Tseltal (Law 2017a). Unlike either of its source languages, Tojol-ab'al has -*el* as the intransitive perfect participle. In section 4.2.4.5 I argued that -*el* is related to the intransitive infinitive suffix -*el* in Tojol-ab'al.

Tojol-ab'al uses -*unej* or -*uj* (interchangeable forms) as the active voice perfect marker. I discuss this more in section 6.2.2.3. Kaufman (1984), Dakin (1988), and Law (2017a) trace -*unej*~-*uj* to the -*nak* active perfect suffix of Chuj, while Kaufman (2015)

and Gómez Cruz (2017) claim that *-unej~-uj* comes from **(-o)-ej* by way of Tseltal *-oj/-ej*. I suggest that the Tojolab'al forms may be blending the two suffixes: *-unej* is more closely related to *-nak*, while the shorter form *-uj* was influenced by *-oj*, but the two suffixes have converged phonologically so that they now behave as a long and short form of the same suffix.

Mocho' and Tojolab'al use *-ob'aal* and *-ub'al* respectively for passive perfect participles. Even though I believe these to be cognate with the *-b'il* suffix seen in other Western Mayan languages, their form differs: they begin in an *o* or *u* vowel, and the middle vowel is /a/ instead of /i/. In section 4.2.2.2 I discussed that the initial *o* or *u* vowel of the suffix in Mocho' and Tojolab'al is probably innovative, but I am not certain what accounts for the variation in the middle vowel; either the suffix had a variable vowel in proto-Q'anjob'alan (which is how I have written it in Table 28 and Table 29) and the vowel fossilized as /a/ or /i/ in the descendant languages, or proto-Q'anjob'alan had *-b'il* and Mocho' and Tojolab'al changed the vowel for an undetermined reason.

Table 30 shows the perfect paradigm in Ch'olan-Tseltalan languages. The intransitive perfect suffix *-em~-en* was retained in all descendants, though it was regularized to *-em* in Tsotsil and to *-en* in Chontal. The exact conditioning environment of the two allomorphs changed slightly in Eastern Ch'olan (Ch'olti' and Ch'orti'): the *-en* allomorph appears only after /m/, not after all bilabial consonants as in proto-Ch'olan-Tseltalan. Chontal and Ch'orti' use *-em~-en* as a passive participle of transitive verbs in some contexts; for a full discussion on this point, see section 3.1.2.3.

Proto-Ch'olan-Tseltalan had a *-V_R*l* "stative participle" suffix that appeared with positional and transitive roots. Tsotsil maintains a productive distinction between -V_R*l* as a non-eventive "stative participle" and *-b'il* as the passive perfect participle, but in Chontal and the Tila variety of Chol, -V_R*l* seems to have replaced *-*b'il* as the passive participle of transitive roots. Chontal and Tila Chol retained *-b'il* as the passive perfect participle with DTVs, and all other Ch'olan varieties kept *-b'il* as the passive perfect participle of all transitive verbs, though Ch'orti' underwent a **l>r* merger that produced *-b'ir.*

Chontal also innovated the preverbal perfect aspect marker *san* or *jan*, as discussed in section 4.2.5.5.

Language	IV	Active		Passive	
		RTV	DTV	RTV	DTV
Proto-Ch'olan-Tseltalan	*-eem ~-een			*-b'il	*-b'il
Proto-Tseltalan	*-em~-en	*-oj	*-ej	*-b'il	*-b'il
Tseltal	-em~-en	-oj	-ej	-b'il	-b'il
Tsotsil	-em	-oj	-oj	-b'il	-b'il
Proto-Ch'olan	*-eem~-een			*-b'il	*-b'il
Classic Mayan	ND			-b'il	-b'il
Chol	-em~-eñ			-V_R*l*, -bil	-bil
Chontal	-en, san/jan	san/jan	san/jan	-el, -V(l) ~ -V'	-bi(l), -äl
Ch'olti'	-em~-en			-b'il	ND
Ch'orti'	-em~-en			-b'ir	-b'ir

Table 30: The perfect paradigm in Ch'olan-Tseltalan languages.

The perfect paradigms of Mamean languages diverged significantly, as shown in Table 31. Each of them innovated a way to express perfect aspect in active voice, though the morphology is different in each case and cannot be reconstructed to proto-Mamean.

Language	IV	Active		Passive	
		RTV	DTV	RTV	DTV
Proto-Mamean	*-*naq*			*-*o-'m*	*-*'m*
Mam	*-na(q),* ***-ni, -naj****, **oo-taq, maa-taq**	***oo-taq, maa-taq***	***oo-taq, maa-taq***	*-'n(-**maj**), -na(j), -aj*	*-'n(-**maj**), -na(j), -aj*
Teko	*-naq,* ***matx, (o)je=tq***	***matx, (o)je=tq***	***(o)je=tq***	*-' ~ -m; -o-'n*	*-' ~ -m; -o-'n*
Awakateko	*-naq*	***-naq***	***-naq***	***-ij; -ij-t***	*-Vn-**t***
Ixil	***-y(aj),*** *-na'q ~ -naj*	***-l(a')***	***-l(a')***	***-l(a'), -el***	***-l(a'),** -m-**al***

Table 31: The perfect paradigm in Mamean languages.

Most Mamean languages kept a reflex of *-*naq* as the intransitive perfect participle, though Mam gained the unproductive suffixes -*ni* and -*naj*, which may be irregular variants of *-*naq*. In Ixil, the reflex -*na'q* gained a glottal stop (section 3.1.1.3). Awakateko extended -*naq* to transitive verbs in active voice, similar to Chuj. (Both changes could have happened independently, acting on the same pressure to fill a gap in the paradigm, or it could have been a result of Chuj-Awakateko contact; Barrett (2002) identified several instances of contact between Q'anjob'alan and Mamean languages.) Mam and Teko both innovated preverbal perfect aspect markers, as discussed in section 4.2.5.4.

The passive perfect participle **(-o)-'m* was retained in Mam and Teko with all verbs, and with DTVs in Awakateko (-*Vn-t*) and Ixil (-*mal*) (sections 4.2.1.1 and 4.2.5.2). In Mam and Teko, **-(o)'m* underwent a regular word-final **m>n* sound change. Awakateko innovated the form -*ij(-t)* with RTVs, discussed in section 4.2.5.2.

Northern Mam and Teko borrowed -*maj* from K'iche'an languages via the Sacapulas Corridor. In Mam, this combined with the existing -*'n* participle to form -*'n-maj* (section 5.3.3).

Ixil recruited an -*el* positional stative participle suffix as the new passive perfect participle, possibly as a result of Ch'olan influence (see section 4.2.4.2). With RTVs, -*el* attaches directly to the root, but with DTVs, the suffix combined with the existing -*m* perfect to form -*mal.*

At some point, Ixil innovated a distinction between the older "perfect participle" (Adell 2019's "resultative stative") and a newer "perfect aspect" category. As discussed above in sections 3.1.6 and 4.2.4.2, the perfect markers -*y(aj)* and -*l(a')* may appear either with finite verbs or in non-verbal predicates; when they appear with finite verbs, they always occur with the *qat=* 'cessive aspect' proclitic (Adell 2019: 269). By contrast, the -*na'q,* -*el,* and -*mal* "resultative stative" suffixes always occur in non-verbal predicates (Adell 2019: 444).

Table 32 shows the perfect in K'iche'an languages. Q'eqchi' was likely the first to split off, then Uspanteko, Poqom, and Core K'iche'an.

Language	IV	Active		Passive	
		RTV	DTV	RTV	DTV
Proto-K'iche'an	*-*i*-*naq*	*-*oom*	*-*V*$_1$*m*	*-*oom*	*-*V*$_1$*m*
Q'eqchi'	-*enaq*	-*om?*	-*m?*	***-b'il***	***-mb'il?***
Uspanteko	***-V*$_R$*´l, -íl, -él,*** *-(i)naq*	-*oom?*	-*V*$_1$*m?*	***-V*$_R$*l,*** -*oom*	***-l***
Proto-Poqom	*-*i*-*naq,* *-*lam*	*-*V*$_R$*m ~ -*om*	*-*m*	***-ooj*** *-*V*$_R$*m*-aj*	*-*m*-*aj*
Poqomam	-*inaq* -*anaq* -*lam*	-*om*	-*m*	-*ooj*	-*(a)maj*
Poqomchi'	-*(V*$_R$*)naq* -*inaq* -*lam*	-*om* ~ -*V*$_R$*m*	-*m*	-*ooj* -*(V*$_R$*)maj*	-*maj*
Proto-Core K'iche'an	*-*i*-*naq*	*-*oom*	*-*V*$_1$*m*	*-*oom*	*-*V*$_1$*m*
K'iche'/Achi	-*inaq*	-*oom*	-*V*$_1$*m*	-*oom*	-*V*$_1$*m*
Kaqchikel	-*inaq*	-*om*	-*m*	-*om*	-*m*
Tz'utujil	-*inaq*	-*oon*	-*V*$_1$*n*	-*oon*	-*V*$_1$*n*
Sakapultek	-*inaq*	***-V*$_R$*m(aj)***	***-m(aj)***	***-V*$_R$*m(aj)***	***-m(aj)***
Sipakapense	-*naq*	***-maj***	***-maj***	***-maj***	***-maj***

Table 32: The perfect paradigm in K'iche'an languages.

Q'eqchi' borrowed -*b'il* from Ch'olan. As discussed in sections 4.2.1.1 and 4.4.3.1, Q'eqchi' retains -*om* (<*-*oom*) as a patient nominalization. Kaufman (1976b), in an overview of K'iche'an languages, records an -*(o)m* or -*(oo)m* active perfect suffix in Q'eqchi' and Uspanteko respectively; this form is not attested in later grammatical descriptions, but if accurate, it would be consistent with a retention from proto-K'iche'an. Because descriptions of the Q'eqchi' aspectual system are incomplete and often contradictory, this topic deserves further study.

Uspanteko, as discussed in section 5.3.1, likely borrowed *-maj* from Poqom as the passive perfect participle. *-maj* subsequently shifted to become a verbal passive suffix. Uspanteko recruited the positional perfect participle *-(V_R)l* (with some variations in vowel quality) as the new perfect participle for all verbs, possibly as a result of Ch'olan influence (section 4.2.4.3). A few intransitive verbs in Uspanteko retain *-inaq.*

Poqom has been discussed at length in section 5.2. The proto-Poqom forms shown here are from the latest stage, immediately before the divergence of Poqomchi' and Poqomam. Proto-Poqom innovated a passive perfect participle **-(o)m-aj* as a fusion of the **-(oo)m* perfect and **-aj* passive suffixes. Later, Poqom extended the RTV action nominalization **-ooj/-uuj* to become a perfect participle, replacing **-om-aj*. At some point, Poqom also innovated a participle *-lam,* which appears on intransitive verbs derived via the *-h-* infix.

The proto-Core K'iche'an perfect paradigm was identical to that of proto-K'iche'an. Tz'utujil (and some Kaqchikel varieties) underwent a word-final **m>n* change that affected the transitive perfect participle. Tz'utujil also innovated an Agent Focus perfect participle *-oyoon~-uyuun* (not shown) (Dayley 1985: 214). As the biggest divergence from proto-Core K'iche'an, Sakapultek and Sipakapense borrowed proto-Poqom **-(o)maj* as the transitive perfect marker in all contexts.

7.3. CONTRIBUTIONS OF THIS RESEARCH

7.3.1. Contributions for Mayan linguistics

This dissertation is the first thorough diachronic study of perfect morphology across the Mayan family. I have given evidence for the shape of the proto-Mayan perfect paradigm and have explored how that paradigm changed between proto-Mayan and its descendants. My analysis is by no means complete, and I offer it as a starting point for further exploration of the Mayan derivational paradigm.

For those working on synchronic description of a Mayan language, this analysis may give context for the origins of that language's perfect morphology, which can help clarify its synchronic distribution. I especially hope that this dissertation inspires more research on the distribution of the perfect and other verbal morphology in modern Mayan languages; as is clear throughout this dissertation, the available descriptions have many gaps and often give only a surface-level description of the form and function of a given morpheme. Further primary research on Mayan languages can reveal much more about the contexts of use of these constructions. I discuss some specific topics for further research in section 7.4 below.

7.3.2. Takeaways for historical morphology

In this project, I have traced the history of a single grammatical function (perfect participles) in the Mayan language family by comparing the morphemes that carry out that function in each descendant language. In doing so, I have demonstrated the value of

considering contexts of use in morphosyntactic change (as in, for example, Barðdal 2013). The most relevant context for Mayan perfect marking is base attachment, or what type of verb stem the participial suffix can occur with: intransitive verbs, transitive roots, and derived transitive verbs; and with transitive verbs, whether the verb is active or passive. In the context of chapter 6, when talking about functional change of the **-ooj/-uuj* suffix, other contexts of use become relevant: whether the derived form can appear as a main predicate or only subordinated to other predicates, what types of object it can take, and whether it takes nominal or verbal modifiers. Considering the detailed contexts of use of a construction allows us to compare its distribution directly across languages and to identify where there are gaps in our data.

Beyond the general principle of comparing usage in detail, this dissertation has also highlighted complicating factors that may arise in reconstructing morphological change. First, if multiple morphemes are widespread with a given function, it can be challenging to decide which of them to reconstruct, or whether they both reconstruct with slightly different functions. Chapter 4 dealt with the **-o-'m* and **-b'il* passive perfect participle suffixes, both of which are widespead in Mayan languages; only by carefully comparing their geographic distribution and pathways of change is it possible to determine which suffix had this function in proto-Mayan (**-o-'m*). This leads to the second point, which is that language contact can disrupt a straightforward comparison of cognate morphemes (Law 2013, Pat-El 2013). In chapter 4 I argued that *-b'il* is so widespread in Mayan languages precisely because of contact among Lowland languages, and in chapter 5 I showed how the participial suffix *-maj* spread areally through Eastern

Mayan languages, so that its distribution in the family no longer conforms to the accepted subgroup divisions. Finally, it is always important to consider pathways of functional change and how this can influence the overall paradigm. Chapter 6 showed that even though reflexes of **-ooj/-uuj* appear as perfect markers in multiple Mayan subgroups, the suffix straightforwardly reconstructs as a marker of action nominalizations, and the perfect reflexes are due to a common pathway in Mayan languages whereby nominalizations become perfect aspect markers. I discuss this pathway further in the next section.

7.3.3. Takeaways for typology of grammaticalization

The main purpose of this dissertation was to understand changes to the Mayan perfect paradigm on their own terms, rather than to construct a larger theory of how grammatical change takes place. However, this study has discussed at least two common routes whereby Mayan perfect aspect constructions have arisen from other grammatical constructions: from nominalizations (especially patient nominalizations) and from non-eventive stative participles. This section briefly places those two pathways in the context of broader typological work on the grammaticalization of perfect marking.

The *World Lexicon of Grammaticalization* lists three major sources for perfect aspect markers: (A) "H-possessive" (i.e. a verb meaning 'to have'), (B) "iamitive" ('already'), and (C) a lexical verb meaning 'throw' (Kuteva et al. 2019: 484). The first is most relevant here. The H-possessive source for the perfect is common in European languages, which Heine and Kuteva (2006: 140-182) argue to be the result of a contact-induced grammaticalization. The following French examples show the verb *avoir* 'to have' (in its form *a*, inflected for 3S subject agreement) acting as a lexical verb (1a) and

as part of a perfect construction, taking the participial form of the verb ‘work’ as its object (1b). Note that *has* in the English translation has the same polysemy.

FRENCH (INDO-EUROPEAN) (Kuteva et al. 2019: 343)

(1) a. *Il* ***a*** *deux enfants.*
He have.3S two children
‘He has two children.’

b. *Il* ***a*** *travaillé beaucoup.*
He have.3S work.PTCP much
‘He has worked a lot.’

Possessive constructions in languages that lack a “have” verb may similarly develop into perfect constructions. In Russian, the possessor is marked for genitive case and occurs as the object of a preposition; (2a) could be paraphrased ‘To me [there is] a car.’ In (2b), just as in (1b) from French, the possessum is replaced by the participial form of a verb, creating a perfect construction.

RUSSIAN (INDO-EUROPEAN) (Kuteva et al. 2019: 343)

(2) a. *U menja mašina.*
PREP me.GEN car
‘I have a car.’

b. *U menja postroen dom.*
PREP me.GEN build.PTCP house
‘I have built a house.’

In sections 4.4.3 and 6.4.2, I have shown examples from Mayan languages where a possessed patient noun developed into an active perfect construction. This can be seen as a special case of the H-possessive source for the perfect. Mayan languages lack a possessive “have” verb; the equivalent construction is an existential predicate whose

subject bears possessor agreement, as shown in (3) from K'iche'. To express a possession relationship between two entities, Mayan languages use a copular construction, as shown in (4). As Larsen (1988: 237-238) suggested, and as I argued extensively in the sections referenced above, active perfect constructions such as (5) are structurally identical to possessive constructions, evidence that they originally derive from possessed patient nouns.

K'ICHE' (Larsen 1988: 236-238, 294)

(3) *k'oo* *jun* *nu-tz'ii'*
EXST one A1S-dog
'I have a dog' (lit. 'There is one my dog')

(4) *at* *nu-k'ajool*
B3S A1S-man's.son
'You are my son'

(5) *at* *nu-ch'ay-oom*
B2S A1S-hit-PERF
'I have hit you' (lit. 'You are my one-who-has-been-hit')

This dissertation also shows examples where a perfect aspect marker arose as an extension of a pure stative marker, a source not listed by Kuteva et al. (2019). The Yucatecan participle *-a'an* (section 3.1.3) and the Western Ch'olan perfect participle *-V_Rl* (sections 3.1.4 and 4.2.4) both originated as stative participles. In Ch'olan the pathway is particularly clear: proto-Ch'olan-Tseltalan distinguished the (eventive) passive perfect participle **-b'il*, which indicates the state of an entity resulting from a prior event caused by an agent, from the (non-eventive) pure stative participle *-V_Rl*, which indicates the state of an entity without entailing a prior event that caused that state. Modern Tsotsil preserves this contrast. In Chontal and Tumbalá Chol, *-V_Rl* has replaced **-b'il* as the perfect participle of transitive roots (4.2.4).

The extension of a stative participle to a perfect aspect marker resembles Condoravdi and Deo's (2014) discussion of the *-ta* suffix in Indo-Aryan. In the oldest texts, *-ta* is polysemous between an (eventive) resultative and a (non-eventive) pure stative reading; both describe a result state of the action described by the verb, but the resultative reading entails a prior event that caused that state, while the pure stative reading does not. In later texts, *-ta* gains other readings associated with "perfect aspect": the "existential perfect" reading, which describes an event occurring prior to topic time without any entailment about a result state, and the "universal perfect" reading, which describes a state that has persisted until the topic time (Condoravdi and Deo 2014: 264-266). As discussed in section 2.2.1, there is not enough information to distinguish between resultative and perfect readings in most Mayan languages; most examples of Mayan "perfect markers" are consistent with a resultative reading. Rather than showing an extension from resultative aspect to perfect aspect, my analysis of Ch'olan *-V_Rl* shows what could be an earlier stage of this progression: a pure stative marker gaining a resultative reading.

7.4. FUTURE RESEARCH

This section addresses ways that future research on Mayan languages can expand the analysis I have presented here. 7.4.1 discusses gaps in the description that future fieldwork or corpus work can remedy. 7.4.2 discusses ways to explore the diachrony of perfect marking in more detail by examining individual subgroups. 7.4.3 speculates about possible pre-Proto-Mayan connections, while 7.4.4 expands the analysis beyond perfect marking to other parts of the verb paradigm.

7.4.1. Data gaps

This study has been constrained by the available data. Some Mayan languages have very robust documentation: K'iche' and Tseltal both have very thorough descriptive grammars that discuss the majority of constructions in the language. On the other hand, some languages lack any detailed coverage of their derivational morphology, or even have wildly contradictory information. Descriptions of Q'eqchi' in particular have a number of gaps, and sources disagree about the semantics of Q'eqchi' aspectual morphology. Most Mayan languages fall somewhere between these two extremes.

Nevertheless, even comparatively robust grammars of Mayan languages often lack important details about a given form's distribution. These include details about base attachment: if a suffix is labeled as occurring with transitive verbs, does it apply equally well to RTVs and various categories of DTV? Grammars differ in to what extent they mention unproductive affixes or allomorphy of a productive affix; in Teenek, Edmonson (1988) catalogs many unpredictable forms, while Kondić (2012) tends to generalize over morphophonological variation and ignore unproductive suffixes. Semantics is particularly underrepresented in current descriptions, and so this dissertation has not attempted to discuss semantic change: "resultative aspect" vs. "perfect" or "perfective" aspect (see sections 1.4 and 2.2.1).

Some of these questions can be resolved by a sufficiently large corpus, where available. For example, an annotated corpus can reveal the frequency of a given suffix and what roots it occurs with. However, some syntactic and semantic questions can most

effectively be answered by original fieldwork, as they require negative evidence and the nuanced intuitions of native speakers. The need for fieldwork is especially great in languages without large publicly accessible corpora.

As an example, Haviland's description of Tsotsil notes a functional difference between the suffixes *-em*, *-b'il*, and *-Vl*, all of which can create participle-like forms from transitive verbs. *-b'il* creates passive participles, which refer to the result state of a prior event caused by an agent; *-em* creates mediopassive participles, which refer to the result state of a prior event without an agent; and *-Vl* creates simple stative adjectives, which refer only to a state without entailing any prior event (Haviland 1981: 258). In section 3.1.2.3, I argued that the mediopassive use of *-em* reconstructs to proto-Ch'olan-Tseltalan because it appears in Tsotsil and in Ch'olan languages, but Polian's (2013) description of closely related Tseltal lacks any mention of the construction; Polian lists *-em* only as a perfect participle of intransitive verbs. At this point I can only argue from lack of evidence; Tseltal may genuinely lack mediopassive participles in *-em*, or this may be a gap in the description. Future work may determine whether this construction exists or is entirely ungrammatical in Tseltal.

Another major category of sources that deserve further study are manuscripts from the colonial period (1500-1821), which include grammars, dictionaries, and texts. While colonial grammars do not have the benefit of modern linguistic theory and often pigeonhole Mayan languages into Latin grammatical categories, they offer a perspective on the grammatical structure of the earliest attested stage of the language. Colonial vocabularies, like modern dictionaries, can reveal patterns of derivational morphology in

lexical entries. Colonial texts are challenging to interpret in that many of them are written by non-native speakers, they often lack Spanish translations, and they are primarily Catholic doctrinal works, a genre that does not fully represent pre-Columbian language usage. Nevertheless, despite the limitations of these sources, it is important to "use all the data" (Lauersdorf 2018), and future work may expand our picture of Mayan derivational morphology as represented in the oldest sources.

7.4.2. Further work on the diachrony of perfect marking

This dissertation has focused on the broad strokes of Mayan participial diachrony: determining which affixes are cognate, which should be reconstructed to proto-Mayan, what was the source of any innovative forms, and how the paradigm changed between proto-Mayan and the modern languages. To continue the art metaphor, after painting the broad strokes, finishing the picture requires filling in the texture, shading, and intricate designs in one section of the painting at a time. The next logical stage of this project is to analyze the distribution of perfect participles in more minute detail: aspectual semantics, syntactic distribution, discursive use, and dialectal variation. The relationship of perfect suffixes to other aspectual morphology, and a comparison of the contexts in which speakers use each form, is crucial here for understanding how the paradigm has changed over time.

I have mainly used secondary sources (descriptive grammars and dictionaries) for this study. These provide representative data about the overall distribution of derivational

morphemes, and so they are useful references for the level of detail I have attempted here. To answer more specific questions will require targeted fieldwork or corpus research, processes that are necessarily slower. Achieving this level of detail for every Mayan language is a job for a large, coordinated research team, and sifting through this much data is the work of careers. A more manageable starting point is to document variation within smaller subgroups that have diverged more recently, or even variation within a single language where this information is available. For example, Core K'iche'an languages are extremely similar, but their aspectual systems have diverged and have undergone developments even since the colonial period (Robertson 1992: 124-139). A thorough corpus study could compare the contexts of use of the perfect and other aspectual morphemes across varieties of Core K'iche'an, including dialectal variation within each language and differences between colonial and modern varieties.

In this way, I consider it important to approach diachronic linguistics from two directions. First, there are broad comparative studies like this one that cover the whole family at once, which establish relationships between constructions that appear in multiple subgroups, whether due to contact or shared retention. This could be considered a "top-down" approach, if one visualizes a language family tree diagram with the proto-language at the top. Second, there are narrower, more detailed studies that examine the variation among closely related descendant groups and extrapolate this level of detail gradually backward toward the proto-language—a "bottom-up" approach. Switching between the two helps maintain both perspective and rigor: broad comparative studies establish a larger context, reorienting the researcher to the big picture amid the weeds of

data, while comparison at a smaller time depth allows a level of precision, thorough coverage of the data, and holistic examination of language and culture that is impossible with surface comparison.

7.4.3. Before Proto-Mayan

The perfect as a category is remarkably stable in Mayan linguistic prehistory. Most of the grammatical morphemes associated with perfect aspect in Mayan languages have always been grammatical morphemes, as far as can be confidently constructed using the comparative method. For example, the *-oom/-uum/-m* perfect suffix of K'iche' can be traced in a direct line to proto-Mayan **(-o)-'m*, which had nearly the same function and distribution (section 4.4.3.1). The innovative perfect suffix *-V_Rl* in Ch'olan-Tseltalan languages was originally a different derivational suffix, which formed stative adjectives from positional roots (section 4.2.4.1). In chapter 4, I claimed that the use of **-b'Vl* as a perfect participle was a Western Mayan innovation; nevertheless, its component suffixes **-Vb'* 'passive' and **-Vl* 'nominalization' both reconstruct to proto-Mayan (sections 4.2.2.4 and 4.4.5).

There are some clues to stages of the language before proto-Mayan. For example, the proto-Mayan **-o-'m* transitive perfect suffix is formally similar to the **-e-'m* intransitive gerund, which became a perfect participle in Ch'olan-Tseltalan languages (section 3.1.2). These have the same basic form, **-'m*, and differ only in the stem vowel of the verb they attach to (**-o* with transitive roots, **-e* with intransitive verbs). While the

two suffixes seem to have had distinct functions in proto-Mayan, the shared form suggests that they were once manifestations of a single suffix (perhaps a nominalization). Somehow, the meaning of the suffix interacted with the transitivity of the base in a way that caused the suffix to bifurcate into two distinct functions. A similar alternation can be seen in K'iche' between the *-ol/-ul/-l* suffix that creates agent nouns from transitive verbs and the *-eel* suffix that creates subject nominalizations from intransitive verbs (López Ixcoy and Sis Iboy 2007: 19-21): in this case, the meaning of the two suffixes is nearly identical (both create nominalizations referring to a participant who performs the action of the verb) but the suffix vowel is conditioned by transitivity.

It is worthwhile to ask what the original lexical sources of these grammatical morphemes may have been. The only way to approach this topic is to identify a lexical item that has sufficient formal and semantic overlap with the perfect to suggest a possible relationship. Such lexical items could have survived in modern Mayan languages: compare *have* in English, which retains its original lexical meaning 'possess' in addition to its grammatical meaning as a perfect auxiliary. Future work on distant genetic relationships between Mayan and other language families could also identify cognates. Mora-Marín (2016) has presented a preliminary study of regular sound correspondences between Mayan and Mixe-Zoquean languages, though his paper identified very few connections between grammatical morphemes. The chance of finding a lexical cognate of proto-Mayan derivational suffixes is small, but it is worth keeping one's eyes open.

7.4.4. Grammatical change beyond the perfect

In section 2.3.3, I outlined a model of Mayan derivational morphology that includes action nominalizations, argument nominalizations (subject/agent/patient nominalizations), and instrument/location nominalizations, in addition to perfect participles. Future work may examine the diachrony of each of these other categories and the paradigmatic connections between them. Chapter 6 examines one of these connections: the proto-Central Mayan *-*ooj/-uuj* infinitive became a perfect marker in Tseltalan, Tojol-ab'al, and Poqom. In section 4.2.1.2, I mentioned how the *-*o-'m* perfect participle seemingly gained an infinitival function in Mamean languages. There are many other overlaps that are worth exploring in more detail.

For example, a *-Vl* suffix creates agent nominalizations from transitive roots in K'iche'an languages, but Poqom has extended it to infinitival contexts. Mó Isém states that the *-ool/-uul* infinitive in Poqomchi' "…occurs only in adverbial purpose clauses, and when it is found in isolation, it is interpreted as an agentive" (2006: 217, my translation). (6) shows an *-ool/-uul* agent nominalization, while (7) shows the same form translated as an infinitive. In Poqomchi', this "infinitive" is used exclusively when the matrix predicate is an intransitive motion verb. The agent of the infinitive clause is identified with the subject of the matrix verb.

POQOMCHI' (Mó Isém 2006: 219)

(6) *K'u ti chik loq i ch'iw-**ool**.*
PART PART already DIR ART bother-AGT
'The bothersome person has already come.'

(7) *Xa* *ch'iw-**ol*** *aj'ux* *wo'* *n-Ø-k'ul-ik.*
only bother-AGT child PART INC-B3S-arrive-IV.SUF
'S/he comes only to bother the children.'

Infinitival *-ool/-uul* is clearly related to the agentive (and not a distinct suffix) because both have the same pattern of allomorphy: the base suffix is *-ool,* harmonizing to *-uul* when the root vowel is /u/, and the suffix vowel becomes short when a bare object follows (as in 7) (Mó Isém 2006: 217-219). In fact, these "infinitives" may still synchronically just be agent nouns. In example (8), Mó Isém translates the form *tikool* as an agentive nominalization, 'sower'. Like the infinitive in (7), *tikool* occurs with an intransitive motion verb (*xojchalik* 'we came'), and the agent performing the sowing is identified with the subject of the motion verb.

POQOMCHI' (Mó Isém 2006: 219)
(8) *Hoj* *tik-**ool*** *x-oj-chal-ik.*
1P.PRO sow-AGT COM-B1P-come-IV.SUF
'We came in the role of sowers.'

I am uncertain whether *tikool* in (8) is best analyzed syntactically as an appositive to the pronoun *hoj* ('We sowers came') or as an adjunct to the verb ('We came as sowers'). Regardless, the function of *tikool* is to indicate the role that the subject plays in the situation, the reason that they came—in other words, *tikool* fulfills the same role as a purpose clause, indicating the purpose of the motion. Along these lines, (7) could just as easily be translated as 'S/he comes only as one who bothers children', where *ch'iwol* is an agent nominalization 'one who bothers' (as in 6).

Such cases of functional change underscore the need to consider Mayan derivational morphology as a system. This means not only looking at a single morpheme, in this case the *-ool/-uul* suffix and how its function changed, but also looking at a given function and keeping track of how different languages express that meaning. For example, Q'anjob'alan languages use a reflex of **-ooj/-uuj* to form purpose clauses (discussed in section 6.5), parallel to *-ool/-uul* in Poqomchi'. A topic for future work could be a comparative study of purpose clauses across the Mayan family, with the aim of reconstructing how proto-Mayan expressed this meaning and how its descendants innovated new constructions. Keeping both formal and functional relationships in mind allows us to understand grammatical change more fully.

Appendix: Sources consulted

This section describes the sources I consulted for this dissertation, listed by subgroup and then by language. This is not an exhaustive list of all extant sources, but it represents those that I have actively used and found most helpful for this study. For more information about how I chose and used sources, see section 2.4.

A.1. K'ICHE'AN

A.1.1. K'iche'

Larsen's (1988) dissertation is my main source for K'iche' and represents one of the most robust grammars available for a Mayan language. Other sources consulted include Mondloch's (1981) thesis on verbal morphology, Christenson's (n.d.) dictionary, and López Ixcoy and Sis Iboy's (2007) compilation of derivational morphology.

A.1.2. Achi

While K'iche' and Achi are considered separate linguistic communities by their speakers and recognized as such by the Guatemalan government, they are mutually intelligible, and linguists typically consider Achi to represent an eastern variety of K'iche' (e.g. Campbell 2017: 45). Many sources on K'iche' include data from Achi, but a few "Achi"-specific sources exist. I primarily referenced the ALMG descriptive and normative

grammars (CLAc 2005, 2016), as well as Sis Iboy's (2007) compilation of derivational morphology.

A.1.3. Kaqchikel

The primary Kaqchikel source for this dissertation was García and Rodríguez's (1997) descriptive grammar, published by OKMA, which notes points of variation among speakers. An additional main source was García Matzar's (2007) compilation of derivational morphology. I occasionally consulted Patal Majzul et al.'s (2000) study of dialectal variation and the ALMG descriptive grammar (CLK 2004); the latter does not thoroughly cover derivational morphology but occasionally has details not found in García and Rodríguez (1997).

A.1.4. Tz'utujil

Dayley's (1985) linguistic grammar was my primary reference for Tz'utujil. I also consulted García Ixmatá's (1997) descriptive grammar and (1998) compilation of derivational morphology, both published by OKMA.

A.1.5. Sakapulteko

My two main sources for Sakapulteko are Du Bois' (1981) dissertation and the OKMA grammar by Mó Isém (2007a). Both are fairly robust descriptions, and they generally agree on details. In addition to the linguistic description, Du Bois includes a chapter

about the linguistic and historical relationships between Sakapulteko and other K'iche'an communities.

A.1.6. Sipakapense

Barrett's (1999) dissertation was the first major study of Sipakapense and is still the most thorough. I also referenced Tema Bautista's (2005) descriptive grammar published by the ALMG.

A.1.7. Poqomchi'

Poqomchi' has two major dialect areas, eastern and western (Campbell 1978). My primary reference is Mó Isém's (2006) licenciate thesis on the phonology and morphology of Western Poqomchi'. Other resources include Brown's (1979) dissertation on Western Poqomchi' word-formation, which sometimes presents analyses that differ from Mó Isém (2006), and Mó Isém's (2007b) compilation of derivational morphology, which largely follows her thesis but has additional examples. Malchic Nicolás et al.'s (2000) dialect survey covers variation in both Poqomam and Poqomchi'. Finally, Marcel Dobbels' (2003) dictionary of Eastern Poqomchi' includes hundreds of seemingly naturalistic full-sentence examples, often exhibiting constructions that no other source expressly describes.

In addition to the modern resources, I have cited individual data points from Stoll's (1888) grammar of Poqomchi', written in German. In my opinion, Stoll's

grammar is comparable in quality to grammars of Mayan languages written in the mid-1900s, and he brings up key data points from an earlier stage of the language.

A.1.8. Poqomam

The most complete source on Poqomam is Smith-Stark's (1983) dissertation, which covers the San Luis Jilotepeque variety. I also consulted Santos Nicolás and Benito Pérez's (1997) published grammar, Malchic Nicolás et al.'s (2000) dialect survey of Poqomam and Poqomchi', and Benito Pérez's (2007) compilation of derivational morphology, all published by OKMA. I have referenced Pedro Morán's (1720) *arte*, a Dominican missionary grammar of Poqomam, for data from the colonial period.

A.1.9. Uspanteko

I have relied on Can Pixabaj's (2007) grammar, the most detailed published source on Uspanteko. When necessary to look up individual words, I consulted Vicente Méndez's (2007) dictionary. The ALMG descriptive grammar (CLU 2001) includes a few examples of perfect participles without much discussion. Kaufman's (1976b) discussion of Sakapulteko and Sipakapense listed Uspanteko grammatical forms based on preliminary survey data, including active voice perfect suffixes *-oom*, *-V_1m* that I have not seen corroborated in any other source (see Table 8).

A.1.10.Q'eqchi'

Even though it is one of the largest Mayan languages by number of speakers, grammatical descriptions of Q'eqchi' are notoriously incomplete and often contradictory. For this dissertation, my primary source was Tzoc's (2003) descriptive grammar published by the ALMG, closely followed by Stewart's (2016) grammar (a lightly updated version of Stewart 1980). The ALMG's Q'eqchi' dictionary (CLQq 2004) contains many helpful full-sentence examples, which often helped clarify situations where the grammars did not provide enough data. For other sources of examples or alternative analyses, I occasionally consulted Tzul and Cacao's (1997) short descriptive grammar published by the PLFM, Tzoc and Cabnal's (2004) normative grammar published by the ALMG, and DeChicchis' (2009) article on Q'eqchi' aspect. As with Uspanteko, Kaufman (1976b) includes data on a Q'eqchi' *-(o)m* perfect suffix that is not labeled as such in other sources.

A.2. MAMEAN

A.2.1. Mam

Mam is the Mayan language with the most dialectal variation, and is divided into three main areas: north, south, and west, with two central subgroups (England 2017: 500). Northern and Southern Mam have the most documentation; the other varieties are mainly represented in studies of dialectal variation.

The main source I used is England's (1983) grammar of Northern Mam (primarily the variety spoken in San Idelfonso Ixtahuacán). As needed, I also consulted Perez Vail and Jiménez's (1997) grammar of the Cajolá (Southern Mam) variety, and Pérez et al.'s (2000) dialect survey, both published by OKMA. Dialectal variation within Mam is particularly relevant for chapter 5, which discusses the diffusion of the *-maj* perfect participle.

A.2.2. Tektiteko

The two most complete descriptive grammars of Tektiteko (also called Teko) are those of Stevenson (1987) and Pérez Vail (2007), the latter published by OKMA. Their descriptions of perfect participles differ, and so I have addressed any discrepancies in the main text. I consulted other sources as needed: Kaufman's (1969) report on Tektiteko, the first academic source to identify it as a language separate from Mam, includes a grammatical sketch with a list of derivational morphemes (1969: 165-166). The Tektiteko linguistic community of the ALMG has published two relevant resources: a descriptive grammar (CLT 2001) and a dictionary (Méndez and López 2018).

A.2.3. Awakateko

The main sources I referenced for Awakateko were the ALMG descriptive grammar (Tuyuc Sucuc 2001) and normative grammar (CLA 2013). I also consulted McArthur and

McArthur's (1966) grammar sketch, which includes a list of derivational morphemes, and Larsen's (1981) article on ergativity in Awakatek.

A.2.4. Chalchiteko

Most linguists consider Chalchiteko a variety of Awakateko (e.g. Campbell 2017: 45), though they are officially recognized as separate communities. The ALMG has published a normative grammar (CLC 2018), which serves to establish written norms for the language but was based on fieldwork with native speakers, and which I referenced to identify derivational morphemes.

A.2.5. Ixil

For Ixil I have relied on Adell's (2019) dissertation, which covers the phonology and morphology of the Chajul variety of Ixil and is the most detailed description available of an Ixil variety. I also consulted Ayres' (1991) grammar, which covers the Chajul and Nebaj varieties; while he has less information about semantics, he lists more variant forms of the perfect suffix, both between the Chajul and Nebaj varieties, and allomorphs within each variety.

A.3. Q'ANJOB'ALAN

A.3.1. Q'anjob'al

I have relied on three main sources for Q'anjob'al. Mateo Toledo's (1998) pedagogical grammar and the ALMG descriptive grammar (CLQ 2005) were my main references for identifying perfect participial morphology. Mateo Toledo's (2008) dissertation on secondary predication in Q'anjob'al was an essential source of examples, particularly of the *-oj/-uj* infinitive that is the focus of chapter 6.

A.3.2. Akateko

Zavala's (1992) grammar is the most extensive linguistic work on Akateko, and the main source for this dissertation. His grammar is descriptively oriented and based on original fieldwork. Peñalosa (1987) gives an early sketch of Akateko grammar; while not detailed, the sketch includes several clear examples of perfect participles and infinitives. In addition, I consulted Silvestre Sánchez's (2013) descriptive grammar and a (2015) normative grammar of Akateko, both published by the ALMG. I referenced both, because sometimes the normative grammar included data not present in the descriptive grammar: Silvestre Sánchez (2015: 233) has a few examples of the infinitive *-o(')*, relevant for the discussion of **-ooj/-uuj* in chapter 6, while Silvestre Sánchez (2013) does not discuss it.

A.3.3. Popti’

My two main sources for Popti’ were Craig’s (1977) descriptive grammar and the ALMG normative grammar (Delgado Rojas et al. 2007). I also consulted Day’s (1973) descriptive grammar and Craig’s (1979) article on antipassive constructions; the latter was particularly relevant for chapter 6 which discusses the relationship of the Popti’ *-o’/-u’* infinitival suffix to the *-ooj/-uuj* infinitive found elsewhere in the family.

A.3.4. Mocho’

Mocho’ is highly endangered and understudied. As of Kaufman 1967, Mocho’ varieties were spoken in Motozintla, Tuzantán, and Amatenango de la Frontera (Kaufman 1967: ii). The Motozintla variety is the best described, and there is some information available for Tuzantán. Unfortunately, I know of no source that treats the Amatenango variety. The main sources I used are Kaufman’s (1967) unpublished vocabulary and field notes, which includes a grammatical sketch, and the dissertations of Palosaari (2011) and Pérez González (2021), as well as a shorter article by Martin (1998) on irrealis constructions.

Though Palosaari’s and Pérez González’s descriptions are more comprehensive, Kaufman’s sketch grammar has the most information on derivational morphology, which was relevant here. Palosaari includes two tables of nominalizing affixes, with little commentary and largely based on Kaufman’s list (Palosaari 2011: 131-132). More research needs to be done on Mocho’ derivational morphology, potentially using corpora.

A.3.5. Chuj

My main sources for Chuj were Maxwell's (1982) thesis on Chuj language usage and the ALMG normative grammar (Domingo Pascual 2007). I also consulted Williams and Williams' (1966) ethnographic and grammatical sketch, Hopkins' (1967[2005]) grammar, and the ALMG descriptive grammar (García Pablo and Domingo Pascual 2007).

A.3.6. Tojol-ab'al

Law (2017a) and Gómez Cruz (2017) have argued that Tojol-ab'al is a mixed language with elements from Tseltal and Chuj. Gómez Cruz's (2017) dissertation, the main source I have relied on here, demonstrates the effects of language mixing by thoroughly comparing Tojol-ab'al grammar to that of Tseltal, Chuj, and other closely related Mayan languages. I have additionally consulted Furbee-Losee's (1976) descriptive grammar and Curiel's (2007) master's thesis on Tojol-ab'al information structure.

A.4. TSELTALAN

A.4.1. Tseltal

Polian's (2013) grammar of Tseltal is one of the most exhaustive descriptions available for any Mayan language. It is based on extensive fieldwork and text collection done in

Oxchuc, Chiapas, from 1998 onward. Tseltal has three main dialect areas: Northern, Central, and Southern. The variety spoken in Oxchuc is situated in the Central Tseltal dialect area and is relatively innovative. Polian makes occasional reference to two other varieties, spoken in Tenejapa (another Central variety) and Bachajón (a conservative Northern variety) (2013: 36). Most of the examples in Polian's grammar come directly from corpus texts. Others were elicited with native speakers. A few basic examples were self-constructed by Polian (a non-native speaker) based on his knowledge of the language (Polian 2013: 46).

A.4.2. Tsotsil

For Tsotsil I have relied on Haviland's (1981) descriptive grammar, which covers the variety spoken in Zinacantán. Aissen describes Haviland's grammar as "quasi-pedagogical" but one that "touches on nearly every topic of syntactic interest in the language with insight" (1987: xviii). I also used examples from Sarles' (1966) dissertation on the San Bartolomé de los Llanos variety.

A.5. CH'OLAN

A.5.1. Chol

Chol has two main varieties, Tila and Tumbalá. This dissertation relies on Vásquez Álvarez's (2011) dissertation, which focuses on the Tila Chol variety, but which indicates differences between Tila and Tumbalá at key points.

A.5.2. Chontal

My main source for Chontal was Knowles' (1984) dissertation, which has fairly comprehensive coverage of derivational morphology, including irregular and unproductive forms. In the course of this study, I have also consulted Osorio May's (2005) master's thesis on Chontal verbal morphology and (2016) doctoral thesis on Chontal syntax.

A.5.3. Ch'orti'

For Ch'orti' I have primarily referenced Wichmann's (1999) morphological sketch. López de Rosa's (2004) descriptive grammar is less detailed but includes several examples of participial forms. Hull's (2016) dictionary includes a great deal of grammatical information; he labels the functions of derivational suffixes that appear in morphologically complex headwords.

A.5.4. Colonial Ch'olti'

Ch'olti' is attested in only one colonial manuscript dating to the 1600s. This manuscript included historical records, doctrinal texts, a vocabulary, and a grammar sketch, all attributed to the Spanish priest Francisco Morán (1695), though there are indications that multiple authors contributed over a period of time (Robertson, Law, and Haertel 2010: 8-23). Sattler (2004) and Robertson, Law, and Haertel (2010) have written grammatical descriptions of Ch'olti' based on analysis of Morán's original. Robertson, Law, and Haertel (2010) is the more comprehensive work, with a full transcription, gloss, and translation of the manuscript as well as a grammatical analysis, but Sattler (2004) occasionally calls attention to grammatical details not mentioned by Robertson, Law, and Haertel. I have referenced both of their secondary descriptions for this work.

A.6. YUCATECAN

A.6.1. Yucatec

Most of the Yucatec examples I cite here are from Bolles and Bolles' (2014) grammar, which has examples of several different contexts of use of the perfect, Bricker's (2019) historical grammar which compares colonial and modern usage, and Hofling's (2017) comparative overview of Yucatecan languages. I also checked forms against Blair's (1964) grammar, which describes the verb template but says very little about the perfect.

A.6.2. Itzaj

My primary source for Itzaj was Hofling's descriptive grammar (Hofling with Tesucún 2000) which includes many examples of derivational morphology, including combinations of affixes; these are most often single-word examples, but he does include several full sentences. I also consulted Schumann Gálvez's (2000) grammar and included examples from Hofling's (2017) Yucatecan overview.

A.6.3. Mopan

For Mopan I used a combination of the Comunidad Lingüística Mopan's (2001) descriptive grammar and Hofling's (2017) comparative overview of Yucatecan languages. I also consulted Schumann Gálvez's (1997) grammar and Hofling's (2007) overview of Mopan morphology (which also has a comparative Yucatecan angle).

A.6.4. Lacandon

There is very little information available on Lacandon perfect marking. The sketch grammar in the introduction of Hofling's (2014) dictionary and his (2017) Yucatecan overview are the two sources that say the most about the perfect, though Bruce's (1968) descriptive grammar and Bergqvist's (2008) dissertation on temporal reference have a few examples.

A.7. WASTEKAN

A.7.1. Teenek

Teenek (also referred to in the literature as Wastek or Huastec) has three major varieties, referred to as Huastec of Veracruz, Huastec of San Luis Potosí, and South Eastern Huastec or Huastec of San Francisco (Kondić 2012: 20). By far the most thorough descriptions, and the ones I referenced the most, are the doctoral dissertations of Edmonson (1988) and Kondić (2012), about the Potosí and South Eastern varieties respectively. Edmonson tends to describe constructions in granular detail, while Kondić often excludes unproductive forms and glosses over variation and exceptions that appear in her examples, but both authors referenced constructions that are key to this analysis. Ochoa's (1984) published grammar of the Veracruz variety is much less detailed; she focuses on phonology and inflectional morphology, and has slightly less than a page about deverbal adjectives such as participles (1984: 98-99).

A.7.2. Chicomuseltec

Chicomuseltec, once spoken in Chicomuselo, Mexico, is now extinct. It is preserved in one fragment of a 1755 confessional, and in wordlists collected by Karl Sapper (1897) and Franz Termer (1928). Günter Zimmerman (1955) compiled these few earlier sources and compared them with Teenek in order to glean as much as possible about Chicomuseltec grammar; his compilation was my main reference for this dissertation. Lyle Campbell and Una Canger (1978) reported that as of their fieldwork in the 1970s,

only a handful of people in the community remembered Chicomuseltec words; there is next to no grammatical information in their report. Norcliffe's (2003) master's thesis reconstructs the history of the Wastekan subgroup, including Chicomuseltec, but she does not discuss the perfect.

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