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The interplay of syntax and prosody in Mam

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The interplay of syntax and prosody in Mam

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by

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ABSTRACT OF THE DISSERTATION

The interplay of syntax and prosody in Mam

by

Noah Eli Elkins
Doctor of Philosophy in Linguistics
Universityof California, Los Angeles, 2023
Professor Kie Zuraw, Co-Chair
Professor Harold Torrence, Co-Chair

A recent research program – which, after Royer (2022), we may call the "prosody as syntactic evidence" research program – has aimed to use a language's prosodic structure to make proposals about its syntactic structure, given that it has long been understood that the two are correlated. This dissertation, situated squarely within this research program, presents two major findings about Mam, an understudied Mayan language of Guatemala and Mexico. First, using a number of purely syntactic diagnostics, I show that Mam's VSO word order is best described as arising from verb-raising (Clemens & Coon 2018), not predicate remnant raising (Coon 2010b) or right-oriented specifiers (Otaki et al. 2019, Little 2020, Scott 2023). Second, I provide further prosodic evidence of this conclusion by describing the prosodic phrasing of Mam VSO declaratives. Across a number of sentence types, including those whose verbs are modified by directional auxiliaries and whose subjects and objects are modified by adjectives, it is shown that Mam's prosodic phrasing can be read directly off the syntactic tree if verb-raising is assumed. These facts in hand, I develop a prosodic typology of VSO languages, and find that only three prosodic profiles are attested, as proposed by Brinkerhoff et al. (2021), among which Mam, despite being syntactically complex, patterns similarly to other well-documented languages like Irish (Elfner 2012, 2015).

The dissertation of Noah Eli Elkins is approved.

Pamela Munro

Sun-Ah Jun

Harold Torrence, Committee Co-Chair

Kie Zuraw, Committee Co-Chair

University of California, Los Angeles

2023

To the memory of Leonard Elkins,
who always wanted me to get an education

and

To the memory of Judy Cohan,
who always loved talking about language with me

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Noah Elkins (2022) Antipossession and nominalization in Mam. *Proceedings of WAIL 24*.

Jacob Aziz & **Noah Elkins** (2021). Malagasy /nr/-strengthening within and across prosodic boundaries. *Proceedings of AFLA 28*.

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CHAPTER 1

Introduction and theoretical landscape

1 Introduction

This dissertation is about Mam, a Mayan language of Guatemala. Here, I aim to understand aspects of its syntactic structure, specifically the derivation of its VSO word order, from a number of analytical and experimental perspectives. In doing so, I show that evidence from syntax as well as evidence from prosody mutually support each other. To that end, I present evidence that a language's prosodic phrasing can tell us a great deal about the underlying syntax from which that prosodic structure is mapped. In this introductory chapter, I look at the theoretical landscape of syntax-prosody mapping, and outline the proposals for how VSO languages are expected to be derived, as well as what the prosodic spellout of those syntactic structures are expected to be. All of this will ultimately inform the investigation into Mam to follow in the succeeding chapters.

1.1 The interface

It has long been understood that prosodic structure is built, at least in large part, to reflect underlying syntactic structure (Chomsky & Halle 1968, McCawley 1968, Selkirk 1974, Selkirk 2011, Elfner 2012). However, the precise nature of the mapping algorithm between syntax and phonology/prosody has been the nature of persistent debate and re-evaluation, as our theories have grown more advanced and precise. Of central importance throughout this debate is the question of *reference*: does the syntax alone provide the blueprint to how prosodic structure is defined, or is there distinct prosodic structure which references, but may act independently of, syntax?

Proponents of the former view, called "direct reference," do not necessarily claim that the domains of phrasal phonology/prosody are identical to syntactic phrases; instead, they argue that phonological groupings between words are created by means of those words' syntactic relationships, for example c-command (Rotenberg 1976; Cooper & Paccia-Cooper 1980; Kaisse 1985; Odden 1987 *et seq.*; Elordieta 2007; Tokizaki 2008; Wagner 2005, 2010; Pak 2008; Samuels 2009; Scheer 2010, 2012a,b; Newell & Piggott 2014, among others).

Proponents of the latter view, called "indirect reference," claim instead that the syntax is first mapped to a purely phonological representation ("prosodic structure"), which itself provides the phonological groupings between words; prosodic structure can improve the wellformedness of the representation based on purely phonological/prosodic criteria without reference to the syntax (Selkirk 1978; Nespor and Vogel 1986; Beckman & Pierrehumbert 1986; Pierrehumbert & Beckman 1988; Hayes 1989; Inkelas 1990; Truckenbrodt 1995, 1999; Ladd 1986, 2008; Shattuck-Hufnagel & Turk 1996; Elordieta 2007; Frota 2012; Seidl 2001; Dobashi 2003; Kahnemuyipour 2003; Gussenhoven 2004; Prieto 2005; Jun 2005b, 2014; Ishihara 2007; Selkirk 2011; Elfner 2012, 2015; Elordieta 2015, among others).

In their review of the modern theoretical landscape, Bennett & Elfner (2019) note that currently, indirect reference theories are in favor among linguists. This theory preference is perhaps because indirect reference theories provide several tangible benefits over direct reference theories, such as blindness to syntactic categories (e.g. McCarthy 1993 on English intrusive-*r*), insensitivity to phonetically null elements (Kaisse 1985; Nespor & Vogel 1986; Truckenbrodt 1995, 1999; Elfner 2012, 2015), ability to account for optionality in phonological processes (Hayes & Lahiri 1991 on Bengali /r/-assimilation), and, most notably, the ability to account for nonisomorphisms (mismatches) between syntax and prosody, as well as noted eurhythmic (wellformedness) effects, which are entirely outside of the purview of syntax (Ghini 1993; Selkirk 2000; Inkelas & Zec 2005; Prieto 2005, 2014; Elordieta 2007; Elfner 2012, 2015; Myrberg 2013).

Within indirect reference, it is most standardly assumed that there exist abstract phonological constituents (prosodic categories) arranged in a hierarchy, where each larger constituent exhaustively contains each smaller constituent (Nespor & Vogel 1986, Vogel 2009, Vigário 2010). It is these categories which form the domains within which certain phonological/phonetic/prosodic processes are defined. The hierarchy is split at the word level, between the sub-word "rhythmic categories," which are not sensitive to syntax, but instead to purely phonological considerations such as rhythm and weight, and the categories at word level and above, the "interface categories," which may communicate with the syntax.

(1) The prosodic hierarchy (e.g. Selkirk 2011)

$$\left.\begin{array}{l}\text{Intonational phrase } (\iota)\\ \text{Phonological phrase } (\varphi)\\ \text{Prosodic word } (\omega)\end{array}\right\}\ \textit{interface categories}$$

$$\left.\begin{array}{l}\text{Foot } (\Sigma)\\ \text{Syllable } (\sigma)\\ \text{Mora } (\mu)\end{array}\right\}\ \textit{rhythmic categories}$$

1.2 The mapping algorithm

Originally, the prosodic hierarchy was assumed to be *strictly layered*: that is, a prosodic constituent of level κ may only dominate a constituent of level κ–1 (Selkirk 1984, Nespor & Vogel 1986, Pierrehumbert & Beckman 1988). Strict layering was soon revealed to be too restrictive, as evidenced by the discoveries of *level-skipping* (dominating κ–n, where $n > 1$) and *recursion* (κ dominating κ) (Kager 1989; Selkirk 1995; Booij 1996; Peperkamp 1997; Itô & Mester 1992/2003, 2009; Ladd 2008; Kabak & Revithiadou 2009). In recent decades, linguists working within Prosodic Hierarchy Theory have adopted *weak layering* (terminology from Itô & Mester 1992), where level-skipping and recursion are permitted (see also Bennett 2018). With the adoption of Optimality Theory (OT; Prince & Smolensky 1993/204), conditions on layering were transformed into violable phonological constraints which may interact with other demands on form (Selkirk 1995).

The central goal within Prosodic Hierarchy Theory is to find the precise algorithm to map constituents of syntactic type *S* to their equivalent constituents of prosodic type *P*. This dissertation will ultimately adopt Match Theory (Selkirk 2009, 2011), a framework of syntax-prosody correspondence which provides a series of correspondence constraints of the MATCH family which govern the mapping from syntax to prosody (and vice versa). Couched within OT, the theory assumes that these constraints are violable and operate amongst a suite of higher- and lower-ranking constraints within the phonological grammar. The details of Match Theory, and its advantages over other competing frameworks, will be explicated in Section 2.

2 Match Theory and its competitors

2.1 Match Theory

Match Theory (Selkirk 2009, 2011) is an indirect reference theory of the syntax-prosody interface which proposes a family of violable Optimality-theoretic correspondence constraints (MATCH). The correspondence constraints demand isomorphism between constituents of syntactic type *S* and their analogous constituents of prosodic type *P*. These constraints, which are assumed to be universal, predict that prosodic form will strongly mirror syntactic form, though not in all cases.

As a type of correspondence constraint family, MATCH is ultimately derived from McCarthy & Prince's (1995, 1999) Correspondence Theory, which uses OT constraints to assign relationships between two linguistic objects. A helpful way of conceptualizing correspondence is in terms of faithfulness. Instead of traditional faithfulness constraints such as MAX or DEP, which govern the relationship between an input phonological representation and its output of the same type of representation, MATCH can be conceived of as faithfulness between representations of different types, one syntactic and one prosodic.

The MATCH family of constraints includes two sets of correspondence constraints, one of which governs the faithful mapping from syntax to prosody (S-P), and the other which governs the reverse (P-S). First, we can examine S-P correspondence, which is analogous to MAX, in that it penalizes the prosodic representation for lacking structure that exists in the syntactic representation.

(2) Match-theoretic S-P correspondences

MATCH-CLAUSE:	Syntactic clause (CP)	$\longmapsto$	intonational phrase (ι)
MATCH-PHRASE:	Syntactic phrase (XP)	$\longmapsto$	phonological phrase (φ)
MATCH-WORD:	Syntactic word (X^0)	$\longmapsto$	prosodic word (ω)

Selkirk (2011) highlights the fact that a general theory of S-P correspondence that encompasses all of the prosodic constituents at or above the level of the prosodic word is novel to Match Theory. That is, while Match theory adopts the prosodic categories which grew out of much work within prosodic hierarchy theory (Selkirk 1978, 1986; Nespor & Vogel 1986; Beckman & Pierrehumbert 1986, Pierrehumbert & Beckman 1988), Match Theory departs from prior work in that it takes these categories as being defined by the syntactic constituents from which they are being mapped. The categories, however, remain real entities, which may delimit the boundaries within which phonological/phonetic/prosodic processes may apply, and which may be referenced by phonological constraints.

Second, we can examine the P-S correspondence constraints, which are analogous to DEP, in that they penalize the prosodic representation for having additional structure that was nonexistent in the syntactic representation.

(3) Match-theoretic P-S correspondences

MATCH-ι:	intonational phrase (ι)	⟼	Syntactic clause (CP)
MATCH-φ:	phonological phrase (φ)	⟼	Syntactic phrase (XP)
MATCH-ω:	prosodic word (ω)	⟼	Syntactic word (X^0)

Selkirk notes that both types of correspondence are required in a complete theory of syntax-prosody correspondence. A more formal definition of constraints within the MATCH family are given below.

(4) Formal definitions of MATCH (Selkirk 2011)

a. MATCH(S, P)
The left and right edges of a constituent of type *S* in the input syntactic representation must correspond to the left and right edges of a constituent of type *P* in the output phonological representation.

b. MATCH(P, S)
The left and right edges of a constituent of type *P* in the output phonological representation must correspond to the left and right edges of a constituent of type *S* in the input syntactic representation.

As has been discussed in the literature (for example, in the review in Ishihara & Kalivoda 2022), the correspondences in (3) and the formal constraint schemata in (4) do not explicitly state the correct method of assessing when strings violate these constraints. While the definitions above make it clear that every constituent of some type which is not isomorphic to its corresponding constituent of the accompanying type should receive a violation in the phonological evaluation, many linguists have agreed that this formulation is somewhat too severe. Instead, it has become common to follow the constraint definitions of Elfner (2012), which assess violations in terms of matching *terminal nodes* rather than *edges*, as in the original formulation from Selkirk (2011). For example, take this definition of Match(XP,φ).

(5) MATCH(XP,φ) (Elfner 2012, p. 28)

Suppose there is a syntactic phrase (XP) in the syntactic representation that exhaustively dominates a set of one or more terminal nodes α. Assign one violation mark if there is no phonological phrase (φ) in the phonological representation that exhaustively dominates all and only the phonological exponents of the terminal nodes of α.

An edge-based version of MATCH(XP,φ) and the novel terminal-based version provided by Elfner (2012) are quite similar, and may often yield the same results. They do differ, however, in how they treat certain S-P mappings. An example given in Ishihara & Kalivoda (2022) highlights this contrast. Assume a structure such as $[_{XP}\ X^0\ [_{YP}\ t\ [_{ZP}\ Z^0\ ]] \longmapsto (_{\varphi}\ \omega_x\ \omega_y)$, where t is a trace, which is syntactically active but phonologically neutral and will receive no phonetic realization at Spell-Out. Per Selkirk's (2011) original constraint formulation, the given output receives two violations of MATCH(XP,φ), as neither YP nor ZP is reflected faithfully in the prosodic representation. However, per Elfner's (2012) formulation, there is just one violation, as YP and ZP *exhaustively dominate* the same set of terminal nodes which receive phonological realization.

(6) Difference between edge-based and terminal-based MATCH (Ishihara & Kalivoda 2022, p. 7)

$[_{XP}\ X^0\ [_{YP}\ t\ [_{ZP}\ Z^0\ ]]$	MATCH(XP,φ)$_{\text{Edge-based}}$	MATCH(XP,φ)$_{\text{Terminal-based}}$
$(_{\varphi}\ \omega_x\ \omega_y)$	2 (YP, ZP)	1 (YP = ZP)

(7) Exhaustive dominance (Elfner 2012, p. 27)

A syntactic node α *exhaustively dominates* a set of terminal nodes β iff α dominates all and only the terminal nodes in β.

Elfner's (2012) formulation of MATCH is helpful in that it predicts that phonologically null material is not needlessly mapped by the S-P mapping algorithm, which, per the review by Ishihara & Kalivoda (2022) is typologically correct. It appears as though despite the large array of silent material within syntactic representation, such as silent functional heads, these may be largely ignored by the phonology/prosody.

2.2 Align/Wrap Theory

A competing indirect reference model of the syntax-phonology interface is what has come to be known as the Edge-Based Approach or Align/Wrap Theory (Chen 1987, Selkirk 1986, Truckenbrodt 1995, 1999). As opposed to Match Theory, within which both the left and right edges of a constituent are targeted at once by the same constraint, Align/Wrap is derived from Selkirk's (1986) Edge-Based Theory, a proposal that languages have a deep parameter setting determining whether they aligns their XPs and phonological phrases to the right or to the left. Truckenbrodt (1995, 1999) attempts to transpose this concept into OT using the ALIGN family of constraints, which compel just one edge (left or right) of a given constituent to stand in correspondence to one edge of its analogous constituent of the accompanying type. These constraints are carried over from the theory of Generalized Alignment (McCarthy & Prince 1993). Therefore, instead of, say MATCH(XP,φ), the analogous constraint(s) here would be ALIGN-L/R(XP,φ). The schemata for these constraints is given below, using XP-φ correspondence as a model.

(8) XP/φ correspondence constraints (modified from Truckenbrodt 1999, p. 223)

a. ALIGN-L(XP,φ)
Assess a violation for each node XP whose left edge is not aligned with the left edge of XP.

b. ALIGN-R(XP,φ)
Assess a violation for each node XP whose right edge is not aligned with the right edge of XP.

Truckenbrodt (1995, 1999), providing data and argumentation from Kimatuumbi (Bantu), also proposes a constraint WRAP(XP), similar in spirit to MATCH(XP,φ), which demands that every XP be contained in some φ. Not only is this constraint proposed to be descriptively useful, but, as we shall see in the next subsection, it can combine with the two ALIGN constraints to create a much richer typology of potential S-P mappings.

(9) WRAP(XP) (modified from Truckenbrodt 1995, p. 228)
Assess a violation for every XP that is not contained in some φ.

2.3 Comparing Match Theory with Align/Wrap Theory

With these two competing theories in hand concerning the mapping from syntax onto prosody, the question is raised concerning which is to be preferred. In this subsection, I briefly examine outline the primary reasons why Match Theory, rather than Align/Wrap Theory, has been the tool of choice in recent years, citing several prominent case studies from the syntax-prosody literature. In short, this preference relies on three major advantages of Match: i) it better captures the distribution of phrasal phonological phenomena across languages; ii) it is inherently more restrictive, creating smaller, better-attested typologies; iii) it is inherently recursive, whereas Align/Wrap relies on the interaction of S-P mapping constraints and NONRECURSIVITY.

First, it has been routinely demonstrated in detailed language-specific case studies of syntax-prosody mappings that Match-theoretic constraints better describe the attested phrasal phonological patterns than do the Align/Wrap-theoretic constraints. This is best seen in languages where recursive structure is in evidence. Elfner's (2012, 2015) detailed phonetic account of phonological phrasing in Connemara Irish (Celtic) phrasing requires that a VSO clause such as $[_{\Sigma P}V\ _{TP}[[DP_1]\ [DP_2]]]$ be spelled out faithfully as $(V\ (_{\varphi}\ (_{\varphi}\ DP_1)\ (_{\varphi}\ DP_2)))$. Even if both asymmetric alignment constraints outrank NONRECURSIVITY, this optimum will be harmonically bounded by candidates with less prosodic structure. In a similar vein, Elordieta's (2015) survey of a variety of sentence types in Lekeitio Basque requires that certain phrases be phrased recursively in order to account for the pattern of pitch downstep and pitch reset observed in the phonetics. Under a strictly edge-based approach, each of the four sentence types brought under scrutiny in the study are given an incorrect prosodic structure, whereas they are correctly predicted by high-ranking MATCH.

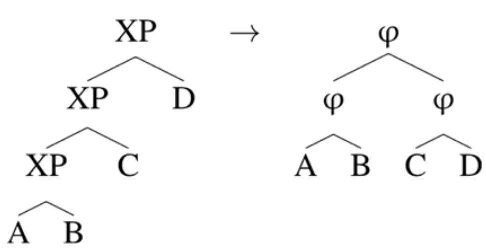
Second, a recent survey of the predicted typologies by Match-theoretic and Align/Wrap-theoretic systems by Kalivoda (2018) has shown that the two frameworks make somewhat divergent typological predictions, but that Match Theory is more restrictive. Specifically looking at the typology of the syntax-prosody of SVO languages collected by Dobashi (2003), Kalivoda demonstrates that Align/Wrap will overgenerate the number of possible/attested languages unless it is reined in by the addition of the constraint NONRECURSIVITY. Match Theory, on the other hand, being inherently recursive, creates more restrictive typologies and never overgenerates. Neither of the two, however, creates a prosodic structure unattested in Dobashi's typology: $*(SV)_{\varphi}\ (O)_{\varphi}$.

As a final note, one consistent and key difference between Match and Align/Wrap is that the former’s constraint family is inherently symmetrical, while in the latter, asymmetries are inherent due to constrains’ directionality. That being said, within a Match system, asymmetries are derivable by means of asymmetric wellformedness constraints, for example STRONGSTART (Werle 2009, Selkirk 2011, Elfner 2012, 2015, Bennett et al. 2016), which parameterizes structure at the left edge of certain prosodic categories. For the most part, Match-theoretic constraints paired with wellformedness constraints have been as successful as Align/Wrap-theoretic constraints at deriving asymmetries in phonological phrasing.

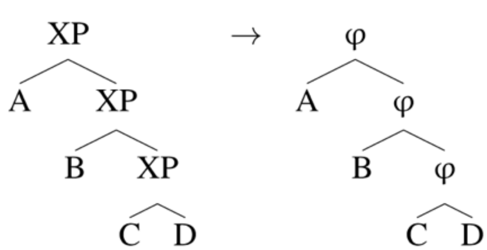
Some recent work, however, has shown that certain very complex syntax-prosody mismatches may require the invoking of *both* MATCH and ALIGN. First, Bellik et al. (2022) discuss a well-documented case of mismatch in four-word structures in Japanese, originally described by Kubozono (1989), and dubbed “Kubozono’s mismatch” by Kalivoda (2018). In Japanese, right-branching four-word XP structures are mapped faithfully onto a right-branching, recursive prosodic representation (10b), but left-branching four-word XP structures are broken up into two binary groupings (10a). Prosodic grouping is diagnosed by pitch downstep within a φ or reset (an f_0 boost) across a φ (Kubozono 1989).

(10) Kubozono’s mismatch (Kubozono 1989, discussed in Kalivoda 2018, Bellik et al. 2022)

a. *Left-branching syntax*



b. *Right-branching syntax*



Per Bellik et al. (2022), Match Theory cannot properly predict Japanese's right-branching as well as left-branching syntax-prosody, and the Match System must be supplemented by asymmetric ALIGN constraints. As such, it is possible that relying on MATCH alone may be insufficient for certain cases of mismatch, unless it can be better understood how cases such as those in (10a) could be better explained by eurhythmy.

3 Using prosody to probe syntax: a review

A recent research program, which after Royer (2022) we might call the "prosody as syntactic evidence" research program, has been successful in using prosody to discriminate between competing proposals for a language's syntactic structure (Clemens 2014a,b; Clemens & Coon 2016, 2018; Royer 2022; Wu 2021, 2022). This dissertation is centered squarely within this research program, and aims to extend its possibilities by testing it against novel data from a Mam, typologically unusual language.

The research program began in earnest with the work of Clemens (2014a,b), whose language of interest is Niuean (Austronesian). Niuean presents a system of pseudo-noun-incorporation (PNI) whereby the verb and direct object form a constituent which fronts to clause-initial position, resulting in VOS word order in certain contexts. PNI is argued by Massam (2000, 2001) to present evidence for a predicate raising path to verb-initiality in Niuean; however, Clemens finds that V and O in this language form a prosodic constituent, and argues that this construction is also consistent with an account by which the object is forced to reorder next to the verb due to prosodic wellformedness. She goes on to argue that verb-raising, rather than predicate-raising, is the most likely syntactic derivation of Niuean V1. This work presents the first major, detailed account using prosody to discriminate between competing proposals for a language's syntax.

Continuing this thread of research, Clemens & Coon (2016, 2018) examine Ch'ol, a Mayan language which has many parallels to Niuean. Ch'ol has alternating VOS/VSO word order, where VOS is used if the object is a bare NP, but VSO is used if the object is a full DP (that is, *definiteness* of the object is crucial to word order). The authors find that the verb and object phrase together in VOS contexts, but that each of V, S, and O form their own phonological phrases in VSO contexts.

This finding indicates that in VOS sentences, Ch'ol may undergo the very same prosodic object reordering construction as Niuean, but only when the object is a bare NP. Clemens & Coon use this information to reject other competing proposals for Ch'ol V1 and make predictions for other Mayan languages.

Moving beyond the study of word order, Wu (2021, 2022) uses the tools of the "prosody as syntactic evidence" research program to examine ellipsis in English. Specifically, she looks at *either... or...* ellipsis, which has been argued to have two syntactic structures. On the first approach, *either* originates as the sister of DisjunctP, then moves to its surface position (Larson 1985, Johannessen 2005); on the second approach, ellipsis occurs within the noninitial disjunct. Each has unique prosodic predictions, which she tests in a production study, ultimately finding support for the ellipsis account.

Each of these studies relies on the reliable mapping from underlying syntax onto surface prosodic structure, which can be observed directly via instrumental methods. The results are extremely insightful, as they use a variety of research angles to successfully home in on the questions of syntax-prosody correspondence. While the program began by examining word order puzzles, it can be easily extended into a variety of other domains, and seems very promising when there are two or more competing accounts of syntactic structure that are difficult to disambiguate.

4 Syntax-prosody: the Mayan landscape

Before discussing the relevant facts from Mam, I will briefly outline the landscape of research into Mayan prosody. The prosodic structure (phrasal and above) of Mayan languages has not received a significant amount of linguistic attention, although certain languages within the family, such as two languages of the K'ichean branch of the K'ichean-Mamean family, K'iche' (Nielsen 2005) and Q'eqchi' (Berinstein 1991, Wagner 2014) have been evaluated within the Autosegmental-Metrical (AM) model of intonation (Liberman 1975; Pierrehumbert 1980; Ladd 1996/2008) using the Tones and Break Indices (ToBI) transcription system (Silverman et al. 1992). The Nielsen (2005) analysis of K'iche', however, is generally regarded to be preliminary (e.g. England & Baird 2017, p. 194); the significantly more developed AM model of Q'eqchi' by Wagner (2014) does not investigate the relationship between syntax and intonation. Outside of the AM research program, the vast majority of prosodic work on Mayan has centered around the expression of topic and focus marking, with a particular bias toward Yucatec Maya, perhaps due to its innovation of lexical tone (Kügler & Skopeteas 2006, 2007, Kügler et al. 2007, Gussenhoven & Teeuw 2008, Avelino 2011).

Some attention within the syntax-prosody literature focused in on the apparent Mayan phenomenon of "prosodic allomorphs" in languages like K'iche' (Henderson 2012). In K'iche', Henderson proposes that particular morphemes display a type of allomorphy such that one allomorph (always the phonologically weightier one) only appeares in intonational phrase-final position. In general, phrase-final position in K'iche' is also documented to be the locus of a final rising intonational contour, which has also been observed throughout the family in different branches (e.g. Hopkins 1967 on Chuj; Berinstein 1991 on Q'eqchi'; Clemens & Coon 2016 on Ch'ol; see also Bennett 2016, DiCanio & Bennett 2018). This contour, and these allomorphs, are also documented at left CP boundaries, leading Royer (2022) to propose an alternative analysis of the data by which the distribution of prosodic allomorphs is entirely retrievable from the surface syntax.

The first true investigation into the syntax-prosody mapping algorithm in Mayan was conducted by Clemens & Coon (2016) on Ch'ol. Ch'ol (Greater Tseltalan-branch), as described aove is a VOS/VSO-alternating language, whereby the alternation in postverbal word order depends on the object's definiteness. In their study, sentences of type VOS and VSO under two conditions (both arguments modified by adjectives or unmodified by adjectives) were read by four native speakers and evaluated for prosodic constituency by determining consistent tonal events within and across speakers. It was determined that H% boundary tones consistently demarcated the right edges of object phrases and subject phrases, but not the verb, in VOS sentences; in contrast, all three of V, S, and O, were marked by H% boundary tones in VSO sentences. High tone pitch peaks were also significantly higher on the first postverbal argument in VOS sentences compared to that of VSO sentences, indicating that in VSO sentences, downdrift had occurred, further demonstrating that the verb is marked with H% in VSO. This data informs the proposal of the following prosodic structure in Ch'ol: $(V)_\varphi$ $(S)_\varphi$ $(O)_\varphi$ but $(VO)_\varphi$ $(S)_\varphi$.

4.1 Why Mam?

Mam (iso code: `mam`) is a Mayan language spoken predominantly in Guatemala and Mexico, with diaspora communities in the United States. According to a recent census, there are approximately 600,000 speakers in Guatemala (Hammarström et al. 2023), who live predominantly in the western highland region of the country.

Mam is a Mamean-branch Mayan language, sharing genetic similarity with Ixil, Awakatek, and Teko. Table 1 below presents the branches of the Mayan language family, with Mam's place within it. The preferred name of the language (if applicable), is given in parentheses following the commonly used name. Mam speakers do refer to their language as *Mam*, however they often simply refer to it as *Qyol* 'Our Language,' or *Qyol Mam* 'Our Language Mam.'

Table 1: The Mayan language family (Royer 2022; based on Kaufman 1976, Law 2014); Mam is given in bold)

<table>
<tr><td rowspan="7">Proto-Mayan</td><th>Primary branch</th><th>Secondary branch</th><th>Languages</th></tr>
<tr><td>Yukatekan</td><td></td><td>Itzaj (Itza'), Lacandon (Lakantun), Mopan, Yukatek (Maya)</td></tr>
<tr><td>Huastecan</td><td></td><td>*Chicomuceltec (Kabil), Huastec (Teenek)</td></tr>
<tr><td rowspan="2">Western</td><td>Ch'olan-Tseltalan</td><td>Ch'ol, Ch'olti', Chontal (Yokot'an), Ch'orti', Tseltal, Tsotsil</td></tr>
<tr><td>Q'anjob'alan</td><td>Chuj, Akatec, Mocho', Popti', Q'anjob'al, Tojol-ab'al</td></tr>
<tr><td rowspan="2">Eastern</td><td>K'ichean</td><td>Achi, Kaqchikel, K'iche', Poqomam, Poqomchi', Q'eqchi', Sakapultek, Spiakapense, Tz'utujil, Uspantek</td></tr>
<tr><td>Mamean</td><td>Awakatek, Ixil, Mam, Tektitek (Teko)</td></tr>
</table>

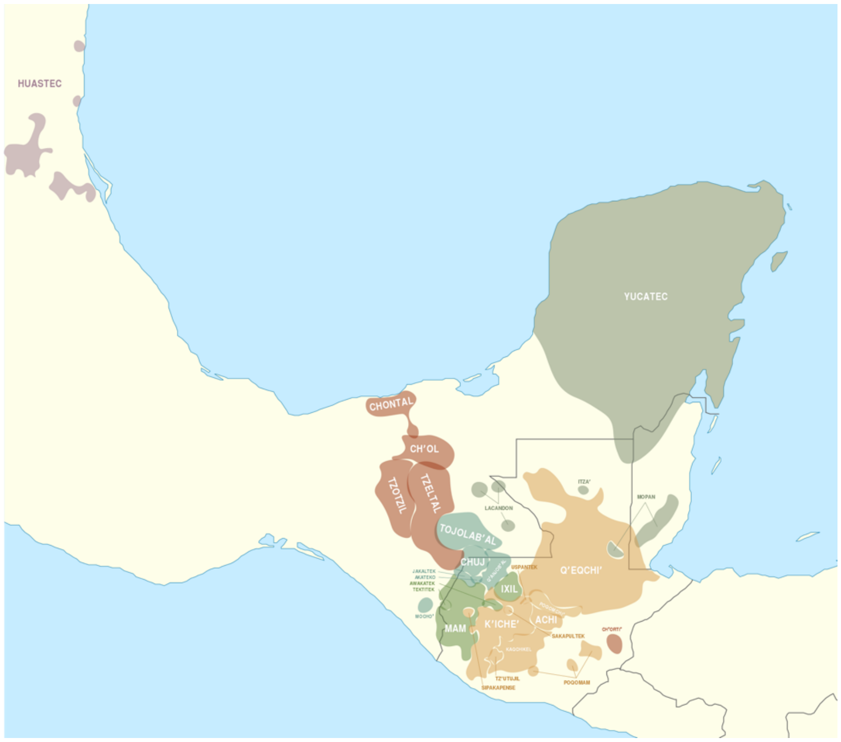


Figure 1: Mayan language area in Central America (Law 2014)

Mam (especially the Mam of Todos Santos, which is the descriptive and empirical focus of this work) is a typologically unusual Mayan language from a variety of vantage points. Each of these angles, taken separately, make Mam an attractive testing ground for linguistic inquiry; taken together, they provide an unusually unique look into how our theories of the syntax-prosody interface play out against such a typologically unusual language.

First, Mam is a Mamean-branch language, which means that it is among the small number of geographically-contiguous Mayan languages of the Mamean and Q'anjob'alan branches which have innovated fixed VSO word order (England 1991). Most Mayan languages are VOS, or are VOS/VSO-alternating, depending on some characteristic of the object (Aissen 1992 proposes that Proto-Mayan was also VOS/VSO-alternating). As such, fixed VSO is considered an innovation within Mayan (England 1991, Aissen 1992; see also Acker 2016, pp. 32-35). Second, even within the fixed-VSO Mayan languages, Mam is unique in that its verbs are almost always complex, composed of the verb and a *directional*, a verbal auxiliary that tracks the movement of the subject/agent. Only some Mayan languages contain directional auxiliaries at all, and for those that do, they are almost categorically post-verbal; in Mam, they are almost categorically pre-verbal. As such, calling Mam a "VSO" language is perhaps misleading, as it abstracts away from the fact that "V" is actually a *verbal complex* consisting of an aspect marker, a directional, and verb root, which together form two morphosyntactic words along with their associated agreement marking. In the example sentence in (11) below, the entire verbal complex is boxed, and the directional complex within it is bolded.

(11) Todos Santos Mam verbal complex within the clause

e-Ø-kub'	t-b'iyo-'n	xin	xjaal	jel	b'alam
COM-2/3S.B-DIR	2/3S.A-kill-DS	CLF	man	CLF	jaguar

'The man killed the jaguar'

To look at sentences in Mam, with a number of independent words within a larger verbal complex, a question quickly arises concerning how they are realized prosodically. No instrumental studies have been undertaken to look at prosodic phrasing in a fixed VSO Mayan language, much less in a language such as Mam where the verbal complex contains two morphosyntactic/prosodic words. As was discussed above, any accounts of prosody within Mayan are relatively scarce, and the single contribution from VOS/VSO-alternating Ch'ol (Clemens & Coon 2016, 2018) has had a great deal of influence in all following literature on Mayan word order and syntax-prosody. In brief, Mam presents a potential wealth of information concerning the spell-out of i) fixed-VSO Mayan languages; and ii) how sentences with and without pre-verbal directionals will be parsed by the prosody.

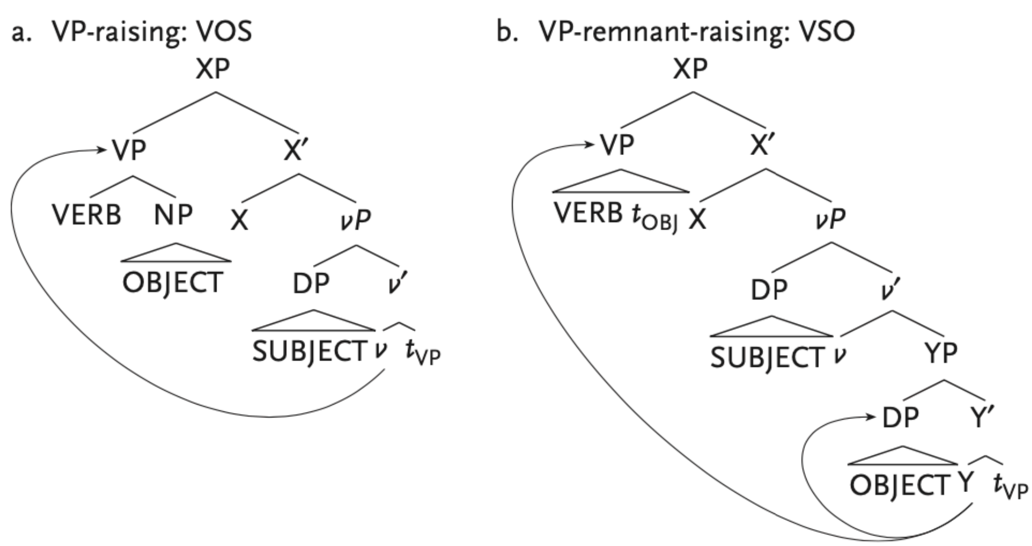
In this dissertation, I evaluate the Mam facts against three competing proposals for the syntactic derivation of VSO Mayan languages, each of which is discussed in detail below: *predicate raising* (§4.2), *verb raising* (§4.3), and *right-side specifiers* (§4.4). Looking ahead, the syntactic diagnostics presented in Chapter 3, as well as the prosodic evidence presented in Chapter 4, present converging evidence that verb raising is correct for Mam.

4.2 VP raising (Coon 2010b)

The first path to verb-initial word order which has been proposed for Mayan is through raising of the predicate to clause-initial position. These approaches are often called *predicate raising* or *VP raising* approaches. VP raising has its foundation in a seminal analysis of Niuean V1 by Massam (2000), and can be found in analyses of a variety of verb-initial Austronesian languages such as Tagalog and Seediq (Aldridge 2002), Hawaiian (Medeiros 2013), and Samoan (Collins 2017). Outside of Austronesian, we find predicate raising proposals for several Zapotec varieties (Lee 2006, Adler et al. 2018), in Mixtec varieties (Hedding & Yuan 2023), and the Mayan language Ch'ol (Coon 2010b; although this would later be revised: see below).

In predicate raising accounts, it is assumed that SVO word order is base-generated, but some phrase containing the main verb and the object raises above the subject: this yields VOS order. In order to generate VSO, the object must first evacuate the phrase that raises above the subject, in a manner reminiscent of Object Shift (Holmberg 1986). Object evacuation followed by phrasal movement is known as or *predicate remnant raising* or *VP remnant raising*. These processes are schematized below, from Clemens (2021, p. 70). (12a) shows VOS emerging from predicate raising; (12b) shows VSO derived from predicate remnant raising following object evacuation.

(12) Predicate-raising constructions for VOS and VSO word orders (Clemens 2021, p. 70)



In predicate raising accounts, a number of key elements are subject to language-by-language variation: i) the exact identity of the XP that raises; ii) the landing site of the raising XP; and iii) (for remnant raising) the landing site of the evacuated object. To take a concrete example, let us examine Ch'ol in more detail. Ch'ol is a VOS/VSO-alternating Mayan language, where VOS is the order given a bare NP object (13), and VSO is the word order given a full DP object (14).

(13) VOS objects in Ch'ol: NPs (Coon 2010b, p. 355)

a.	Tyi	i-kuch-u	[*NP*	si'	]	aj-Maria
	PVF	A3-carry-TV		wood		NC-Maria

‘Maria carried wood'

b.	*Tyi	i-kuch-u	[*DP*	jiñi	si'	]	aj-Maria
	PFV	A3-carry-TV		DET	wood		NC-Maria

Intended meaning: ‘Maria carried the wood'

(14) VSO objects in Ch'ol: DPs (Coon 2010b, p. 355)

a.	Tyi	i-kuch-u	aj-Maria	[*DP*	jiñi	si'	]
	PFV	A3-carry-TV	NC-Maria		DET	wood	

‘Maria carried the wood'

b.	*Tyi	i-kuch-u	aj-Maria	[*DP*	si'	]
	PFV	A3-carry-A3	NC-Maria		wood	

To generate VOS from VSO, Coon (2010b) proposes that the *v*P constituent, containing both the verb and the NP object, is fronted to Spec,TP, where it is pronounced in initial position (15a). When the object is a DP, Coon proposes that it must evacuate *v*P and then the *v*P remnant moves to Spec,TP (15b).[1]

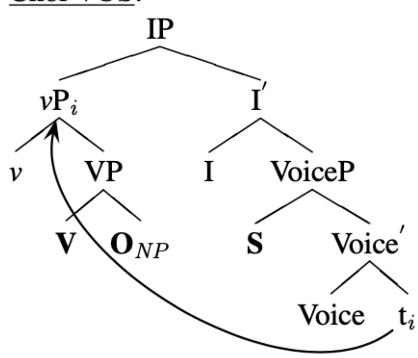
Adjuncts such as adverbs and PPs may intervene between the verb and the DP object, however they may not intervene between the verb and an NP object, indicating that the latter two form a tighter constituent. Additionally, following Massam's (2000, 2001) account of Niuean, Coon proposes that predicate movement is governed by strong features on T^0 which require its specifier to be filled. Explaining an observed lack of head movement in Ch'ol, Coon proposes that predicate raising is a movement of “last resort,” as the v^0 head cannot independently be raised to T^0. It would be later shown through continued work on Ch'ol that head movement is indeed

[1] In (15b), we see that Coon labels the landing site Spec,Abs(olutive)P, because, following Massam (2000), the moved object is able to have absolutive case licensed at that position.

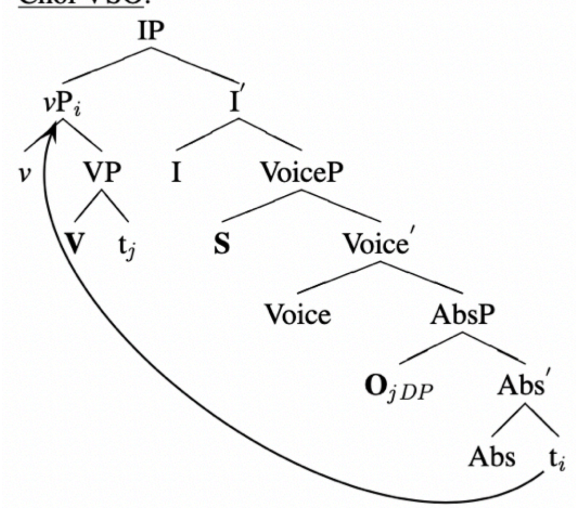
possible in the language, and that other demands, especially prosodic ones, would be argued to deriving its VSO; see Coon (2017), as well as Clemens & Coon (2018), which I discuss in §4.3 to follow. That said, the structures proposed by Coon 2010b, as well as their motivations and predictions, are important context for the discussion in §4.3.

(15) VP (remnant) raising in Ch'ol (Coon 2010b, p. 3)

a. Chol VOS:



b. Chol VSO:

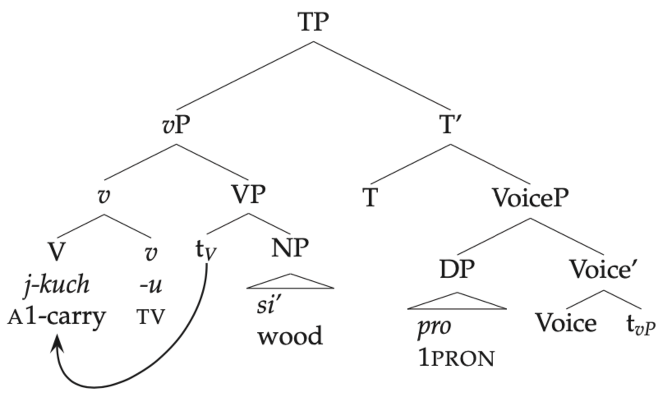


There are three major challenges to predicate-raising in Ch'ol, which appear when the data are put to greater scrutiny. The first challenge, from Little (2020b, pp. 141-142), comes from the linearization of morphemes. In Mayan, aspect marking always precedes the main verb and is widely assumed to be hosted on T^0/Infl^0 (Aissen 1992). The predicate-raising account given above assumes that the *v*P has been fronted to Spec,TP, and should therefore linearly precede, and not follow, the aspect morpheme. In (16), we see an example of a a pre-verbal aspect morpheme, in this case, the perfective *ta'*. In (17), we see how movement of the predicate *j-kuch-u si'* to Spec,TP would lead to the incorrect word order. Note also that verbs in Ch'ol carry a *status suffix* (SS) which tracks transitivity information. In (16), the suffix *-u* is the appropriate transitive status suffix, glossed 'TV.'

(16) Ch'ol: pre-predicative aspect morpheme (Little 2020b)

Ta' j-kuch-u si'
PFV A1-carry-TV wood
'I carried wood'

(17) Ch'ol: predicate fronting diagram of (16a) with problematic order (Little 2020b, #247; aspect morpheme not shown)



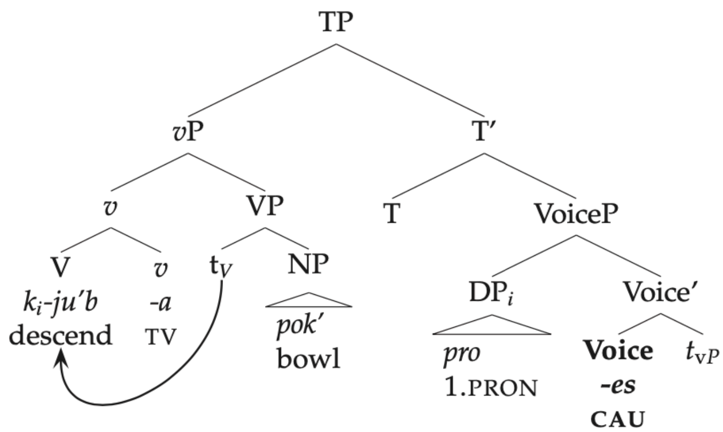
The second challenge, which is discussed in Clemens & Coon (2018), concerns the addition of extra voice morphology on the verb which is assumed to be external to *v*P. Specifically, causative morphemes, which are on the hierarchicaly superior head Voice^0 (Pylkkänen 2002), may be found on the verb stem. The following example shows the causative morpheme *-es*.

(18) Ch'ol: causative morphemes on the verb stem (Little 2020b)

Ta' k-ju'b**-es**-a pok'
PFV A1-descend-**CAUS-**TV bowl
'I took the bowl down'

The question arises, then, concerning which XP is able to front, if at all. For Coon (2010), the status suffix is hosted on *v*^{0}, and therefore there is no constituent which exhaustively contains the verb, object, and status suffix but *not* the subject. If the *v*P fronts, as has been assumed, then the causative morpheme (and any other morpheme on Voice^0) will be stranded outside of the fronted *v*P (19).

(19) Ch'ol: predicate fronting diagram with stranded causative morpheme (Little 2020b, #250); aspect morpheme not shown



The third challenge has to do with reconciling predicate raising with the inablity for transitive subjects (agents) to Ā-extract. This restriction is known as the *ergative extraction constraint* (EEC; see Coon et al. 2014 for extensive discussion). and languages that obey it are called *syntactically ergative*. Mayan languages which obey the EEC may not freely Ā-extract ergative subjects, but must instead use the antipassive or "Agent Focus" (AF) voice as a repair. In the currently most widely accepted account of syntactic ergativity, EEC-obeying languages have a process by which objects raise to a position superior to subjects in order to be case-licensed by a high absolutive case assigner, namely T^0. This high object then acts as an "intervener" to Ā-probes on C^0 attempting to access the subject (Coon et al. 2014; see also Coon et al. 2021). Mayan languages which are not syntactically ergative have been argued to be able to case-license their objects low, by v^0. If high objects lead to syntactic ergativity by means of an intervention effect, then an object which has been moved above the subject as part of the raised predicate should act as an intervener in the same way. However, Ch'ol is not a language which obeys the EEC: ergative subjects are free to be extracted without repair (20).

(20) Ergative subjects licitly extract in Ch'ol (Coon et al 2014, #24)

a. Tyi y-il-ä-yety
ASP 3A-see-TV-2A
'She saw you'

b. Maxki$_i$ tyi y-il-ä-yety ____$_i$?
who ASP 3A-see-TV-2A
'Who saw you?'

On that note, it is additionally difficult to see how objects can subextract from a raised predicate as well, if we consider the Freezing Principle (Ross 1974, Wexler & Cullicover 1977), a ban on extracting from already-moved constituents, which become islands.

(21) Ch'ol (Little 2020b, p. 39)

a.

Aj-Maria$_i$	ta'	i-juch'-u	sa'	____$_i$
NC-Maria	PFV	A3-grind-TV	masa	

'*Maria* ground masa'

b.

Sa'$_i$	ta'	i-juch'-u	____$_i$	aj-Maria
masa	PFV	A3-grind-TV		NC-Maria

'Maria ground *masa*'

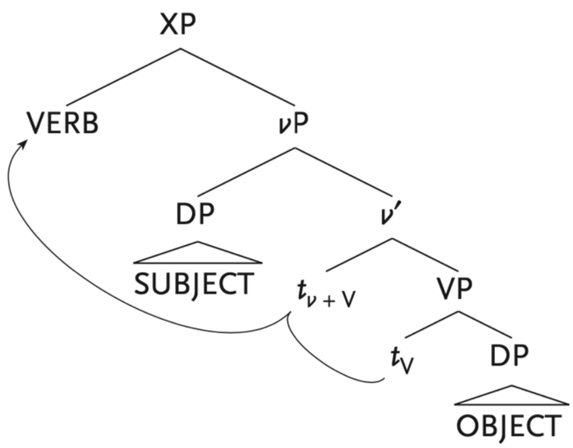
The grammaticality of (21b) in Ch'ol would be a violation of the Freezing Principle. We could posit that in Ch'ol, all objects that undergo focus movement *must be DPs*, and therefore are not in the fronted predicate, having evacuated earlier. However, this means that all focused objects must have a definite interpretation, which is not clear from the translation in (21b).

In sum, argumentation presented from a variety of syntactic fronts leads us to posit that predicate-raising for a Mayan language such as Ch'ol (as argued by Coon 2010b) is most likely untenable. Indeed, the word order analysis for Ch'ol is revised in Clemens & Coon (2018), wherein predicate raising as Ch'ol's path to verb-initiality was ultimately abandoned.

4.3 Verb raising (Clemens & Coon 2018)

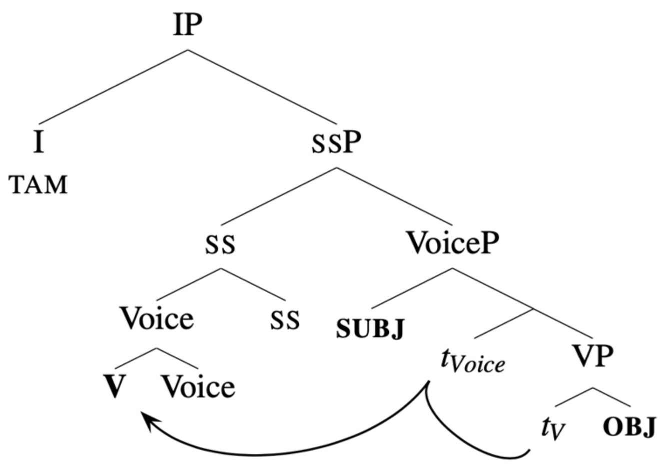
The second path to verb-initial word order I will discuss here is the raising of the verb alone (as opposed to the entire predicate VP/*v*P, etc.) above the subject. This approach has been called *verb raising*, v^0 *raising*, or *head raising*. Popular in accounts of Polynesian verb-initiality, this approach has been proposed for Māori (Waite 1989, Pearce 2002), Tongan (Custis 2004; Otsuka 2000, 2005), and Niuean (Clemens 2014a, 2019). We also find verb-raising accounts for Celtic languages such as Irish (McCloskey 1991) and Welsh (Sproat 1985), and for V1 Afro-Asiatic languages such as Arabic (Fassi Fehri 1993, Ouhalla 1994). More recently, the Ch'ol account of V1 by Coon (2010) was revised to a verb-raising account by Clemens & Coon (2018), where VSO is generated through verb-raising, and post-syntactic prosodic constraints work to drive VOS (more on this below).

(22) Schematization of verb-raising to VSO (Clemens 2021, p. 71)



As in predicate raising, verb raising accounts assume a base-generated SVO structure, but the verb rolls up through a series of functional projections until it lands in a position above to the subject, with languages varying as to the exact landing site. This movement easily derives VSO word order. To derive VOS word order using verb raising, there are two types of analyses: one syntactic and one prosodic. Under the syntactic approach, the object additionally scrambles to a position above the subject (e.g. Otsuka 2002, 2005 for Tongan; Rackowsky & Richards 2005 for Tagalog). In other languages, such as in Ch'ol and Niuean, this account is untenable, as the verb and object form a syntactic constituent on the surface, and therefore the object must not have been scrambled. Clemens & Coon (2018), therefore, analyze Ch'ol, a VOS/VSO-alternating language, as attaining VSO via verb-raising but VOS via *prosodic* reordering of the object. The head-raising schematization of VSO for Ch'ol (which Clemens & Coon 2018 theorize is applicable to all Mayan) is given below. Note that the projection which serves as the ultimate landing site for the raised verb is SS^0, which in this analysis is high in the extended verbal domain and realizes status suffixes, which linearize at the far right of the verb stem across Mayan.

(23) Head-raising account in Ch’ol/pan-Mayan (Clemens & Coon 2018, p. 241)



Again, this structure neatly generates VSO, but for a language like Ch’ol in which VOS is also available, more needs to be said. Clemens & Coon’s have a *prosodic reordering* account of VOS, couched within Match Theory (Selkirk 2009, 2011). On this approach, as has been described above in §2.1, constraints on syntax-prosody mapping compete with prosodic wellformedness constraints in a dedicated OT-based phonological component. Informed by a production experiment (Clemens & Coon 2016), the authors provide that the prosodic phrasings of Ch’ol VSO and VOS clauses are the following.

(24) Prosodic phrasings of VSO and VOS clauses in Ch’ol (Clemens & Coon 2018, p. 252)

a. $(V)_{\varphi}\,(S)_{\varphi}\,(O)_{\varphi}$ DP object
b. $(V\ O)_{\varphi}\,(S)_{\varphi}$ NP object

Recall that in Ch’ol, the definiteness of the object is responsible for the alternation in word order. In (24) above, we can see that NP objects always phrase with the verb, whereas DP objects form their own phonological phrase *φ*. In order to account for this fact, Clemens & Coon (2018) propose a prosodic wellformedness constraint ARGUMENT-*φ* (Clemens 2014a) to be active, which demands that heads of any type be phrased together with their arguments. If highly ranked, this constraint may easily derive a prosodic representation which is non-isomorphic to the underlying syntax.

(25) Argument condition on phonological phrasing (modified from Clemens & Coon 2018, p. 258)

a. A head H^0 with a category feature [C] and a head C^0 with the same [C] feature must constitute a phonological phrase φ.

b. ARGUMENT-φ
Assess a violation to any output which violates the proposition in (a).

Crucially, Clemens & Coon (2018) claim that only DPs, not NPs, are sensitive to ARGUMENT-φ because they are *phasal*. As phases, they are spelled out (submitted to PF) before they can be evaluated by ARGUMENT-φ, which connects the verb and its object via c-selection. This division assumes multiple phase-based spellout of the syntactic derivation (Uriagereka 1999), where syntactic constituents are only assigned prosodic structure after they are transferred to the interfaces following the introduction of the next-highest phasal head (Kahnemuyipour 2004, Ishihara 2007, Kratzer & Selkirk 2007). Minimally, D^0, v^0/Voice^0, and C^0 are phase heads on this approach, following much work in Phase Theory (Chomsky 2001, Dobashi 2003, Svenonius 2004, Hiraiwa 2005).

If ARGUMENT-*φ* ≫ MATCH(*φ*,XP), an NP object, which is still available for prosodic manipulation, must be grouped in the same phonological phrase as the verb despite the fact that that resultant phonological phrase does not match the left and right edges of any XP from the input. The tableau in (26) below shows the interaction between ARGUMENT-φ and the relevant MATCH constraints.

(26) ARGUMENT-*φ* ≫ MATCH(*φ*,XP), MATCH(XP,*φ*) (Clemens & Coon 2018, p. 258)

[$_{vP}$ Verb [$_{VoiceP}$ [$_{DP}$ Subject] [$_{VP}$ [$_{NP}$ Object]]]]	ARG-φ	MATCH(φ,XP)	MATCH(XP,φ)
a. (Verb (Subject)$_φ$ (Object)$_φ$)$_ι$	*!		
b. ☞ ((Verb Object)$_φ$ (Subject)$_φ$)$_ι$		*	*

This ranking is still proposed to hold for VSO in Ch'ol, but since DP objects in VSO are not sensitive to ARGUMENT-*φ*, they will not prosodically reorder like NP objects. Instead, the winning candidate will be the one which violates the fewest MATCH constraints. Clemens & Coon (2018) also introduce one other wellformedness constraint that is widely used in the literature and is typologically well-supported: STRONGSTART (Werle 2009, Selkirk 2011, Elfner 2012, 2015, Bennett et al. 2016).

(27) STRONGSTART (as defined in Selkirk 2011)

a. A prosodic constituent optimally begins with a leftmost daughter constituent that is not lower in the prosodic hierarchy than the constituent that immediately follows.
b. Assess a violation on any output form which violates the proposition in (a).

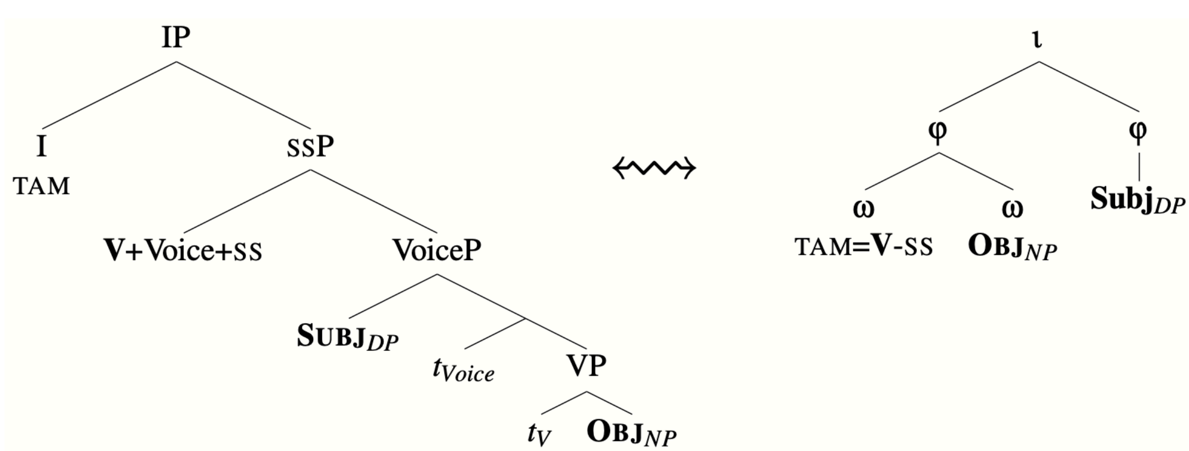
This constraint works to rule out forms such as (28a) below, which are isomorphic with the syntax but are nonetheless prosodically illicit because they begin with a *weak start*. Below, the phrases which are phasal, and therefore have already been given prosodic structure before the completion of the entire derivation, have been crossed out, following the convention of Clemens & Coon (2018). This is due to the fact that they are not evaluated by the relevant constraints.

(28) No prosodic reordering for VSO objects (Clemens & Coon 2018, p. 262)

$[_{vP}$ Verb $[_{VoiceP}$ $[_{DP}$ Subject] $[_{VP}$ $[_{NP}$ Object]]]]	STRONGSTART	ARG-φ	MATCH (φ,XP)	MATCH (XP,φ)
a. (Verb (~~Subject~~)$_{\varphi}$ (~~Object~~)$_{\varphi}$)$_{\iota}$	*!			
b. ☞ ((Verb)$_{\varphi}$ (~~Subject~~)$_{\varphi}$ (~~Object~~)$_{\varphi}$)$_{\iota}$			*	
c. ((Verb ~~Object~~)$_{\varphi}$ (~~Subject~~)$_{\varphi}$)$_{\iota}$			*	*!

To locally summarize, the syntactic input which was created via verb-raising and its potential prosodic reordering is given diagrammatically for Ch'ol below in (29). The convention used is to mark a syntactic structure *S* and a prosodic structure *P* with a squiggly arrow (↭) to mean "*S* and *P* correspond to each other before/after Spell-Out."

(29) Syntactic input and prosodic output of VOS order (Clemens & Coon 2018, p. 258)

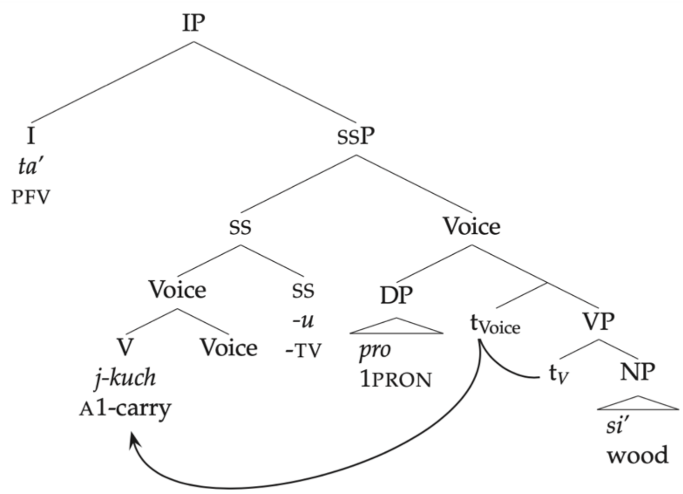


The verb-raising account solves the key issues plaguing the predicate-raising account of Coon (2010b). First, it can easily account for the order of morphemes in the Mayan verbal template, as the proposed landing site of the raised verb is now SS^0, which is necessarily *below* T^0, the locus of aspect marking in Mayan. Recall that in the predicate-raising account, it was unclear how the aspect marking ould be able to ultimately appear before the raised predicate. We see a derivation that gets the word order correct in (30b) below.

(30) Ch'ol head movement (Little 2020b, p. 142)

a. Ta' j-kuch-u si'
PFV A1-carry-TV wood
'I carried wood'

b.

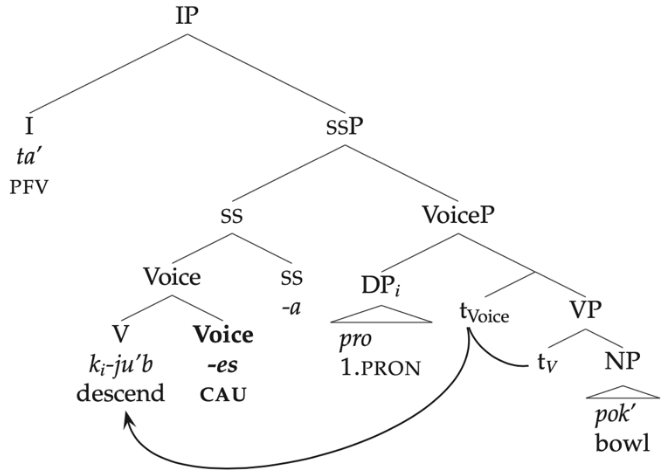


Second, head-raising additionally does not encounter the issue of stranded morphemes such as the causative. Recall that under the predicate-raising account, any morpheme which is introduced outside of the fronted *v*P constituent has no way of being reassociated after phrasal movement. However, if it is just the verb itself which head-moves, it may collect any number of verbal affixes, such as the causative, on its way to its ultimate landing site (31a,b).

(31) Ch’ol head movement and voice morphemes (Little 2020b, p. 144)

a. Ta’ k-ju’b-**es**-a pok’
PFV A1-descend-CAUS-TV bowl
‘I took the bowl down’

b.



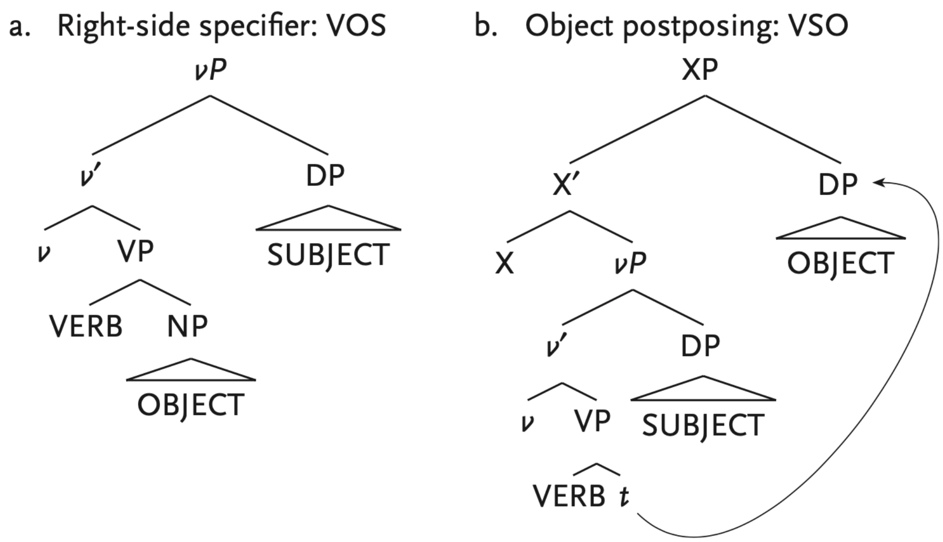
Last, this account does not fall prey to any argumentation concerning extraction. In the predicate raising account, it was unclear how subjects could licitly extract in Ch’ol if the object was always part of a constituent which intervened between it and a higher Ā-probe (e.g. Coon et al. 2014). There was also some difficulty in explaining how subextraction out of the raised predicate would be possible if objects needed to be extracted, given that the predicate should be an island for extraction given the Freezing Principle (Ross 1974, Wexler & Culicover 1977). As verb-raising account does not involve the raising of the object, it faces neither of these extraction-based issues.

4.4 Right-side specifiers (Otaki et al. 2019, Little 2020, Scott 2023)

The final path to verb-initiality in Mayan has come to be known as the *right-side specifiers* approach, but is often shortened *right-spec*, or called the *base-generation* approach. This approach, necessarily involving a non-antisymmetric Merge parameter, was rather popular in the early decades of literature on Mayan syntax (e.g. Larsen 1988, England 1991, Aissen 1992). In recent years, however, right-side specifier analyses have gained increasing currency in Mayan linguistics, and have been proposed for Kaqchikel (Otaki et al. 2019), Ch'ol (with extensions to any and all fixed-VSO Mayan languages) by Little (2020b), and for Mam specifically by Scott (2023).

Under this approach, specifiers are rightward (at least under *v*P), whereas heads remain leftward. This means that the subject, while still c-commanding the object, will follow it in linear order. This state of affairs base-generates VOS word order, instead of assuming that SVO order is default. In order to generate VSO order, the object must be extraposed rightward above the subject (*object postposing*). A schematization of the different word orders on this approach are given below in (32).

(32) Right-side specifier constructions for VOS and VSO word orders (Clemens 2021, p. 69)



Different proposals of right-side specifiers differ with respect to a number of features, such as which (if any) specifiers are leftward within the structure, and (if object postposing is required) the ultimate landing site of the postposed object. For example, on the second point, in the abstract schematization above, the object has moved to the specifier of a higher functional projection, Spec,XP; in Little (2020), the object in VSO Mayan languages is predicted to move to an additional specifier of *v*/VoiceP (more on Little's analysis below in §4.4.2). The following subsections outline recent proposals of Mayan clause structure invoking right-spec syntax: Otaki et al. (2019) on Kaqchikel, Little (2020b) on Ch'ol, and Scott (2023) on Mam.

4.4.1 Otaki et al. (2019)

Why have linguists chosen to pursue the right-sided specifiers account of V1, which does not adhere to antisymmetry (Kayne 1994 *et seq.*)? We can first look at the reasoning for Otaki et al. (2019), whose empirical focus is Kaqchikel (K'ichean-branch). Kaqchikel allows both VOS and VSO word orders (33); however, VOS has been reported to be more "basic" (e.g. García Matzar & Rodríguez Guaján 1997). Interestingly, the alternation between VOS/VSO is not driven by features of the object, in contrast to the situation Ch'ol.

(33) Kaqchikel (Otaki et al. 2019, #2)

a.	X-Ø-u-chöy	ri	chäj	ri	ajanel	(VOS)
	CP-B3SG-A3SG-cut	DET	pine.tree	DET	carpenter	

'The carpenter cut the pine tree'

b.	X-Ø-u-chöy	ri	ajanel	ri	chäj	(VSO)
	CP-B3SG-A3SG-cut	DET	carpenter	DET	pine.tree	

'The carpenter cut the pine tree' (same as 33a)

Also in contrast to Ch'ol, which did not allow adjuncts such as adverbs to intervene between the verb and an NP/indefinite object, in Kaqchikel, an adverb (e.g. *iwir* 'yesterday') may intervene between the verb and its object, regardless of definiteness (34).

(34) Kaqchikel (Otaki et al. 2019, p. 37)

a.	X-Ø-u-chäj	**iwir**	jun	ch'ich'	ri	a	Xwan	(V **Adv** O_{indef} S)
	CP-B3SG-A3SG-wash	yesterday	DET	car	DET	CL	Juan	

'Juan washed a car yesterday'

b.	X-Ø-u-chäj	**iwir**	ri	ch'ich'	ri	a	Xwan	(V **Adv** O_{def} S)
	CP-B3SG-A3SG-wash	yesterday	DET	car	DET	CL	Juan	

'Juan washed the car yesterday'

c.	X-Ø-u-chäj	ri	ch'ich	**iwir**	ri	a	Xwan	(V O **Adv** S)
	CP-B3SG-A3SG-wash	DET	car	yesterday	DET	CL	Juan	

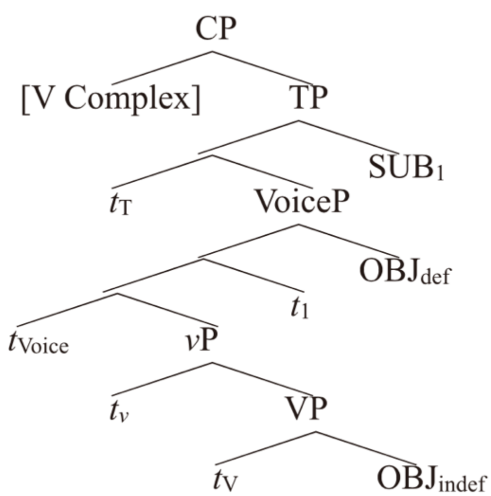
'Juan washed the car yesterday'

d. X-∅-u-chäj ri ch'ich ri a Xwan **iwir** (V O S **Adv**)
CP-B3SG-A3SG-wash DET car DET CL Juan yesterday
'Juan washed the car yesterday'

The above data cause the authors to reject a predicate-fronting analysis of Kaqchikel verb-initiality. First, whereas in Ch'ol the fronted predicate's object must always be a bare NP, in Kaqchikel, the VOS object may be a definite DP. Second, the authors take the various positions of the object with respect to the adverbs to indicate that the object may appear at syntactic positions of differing height. Third, the authors follow Imanishi (2014), Coon et al. (2014), and much subsequent work in assuming that absolutive case is licensed to objects by T^0 in high-absolutive languages like Kaqchikel; if the object raises above T^0 as part of the predicate, there would be no way to establish such an Agree relationship.

The authors therefore adopt a right-spec account of Kaqchikel VOS, whereby indefinite objects remain low in VP but may raise to Spec,VoiceP if definite (this does not change linear order, per (34)). They also propose that the subject moves to a rightward-projecting Spec,TP to check an [EPP] feature, thereby securing its position at the rightmost linear position in the clause despite being the highest structurally. The entire verb complex moves above the subject to C^0, for which it is necessary that all aspect/mood markers be affixal and initial in the clause, which does not appear to be false. A schematization of this structure is given below in (35).

(35) Kaqchikel VOS (Otaki et al. 2019, #27b)



We can offer some critiques of the above proposal. First, the authors do not explain how they would account for VSO word order, which is also grammatical in Kaqchikel, but given how it is derived in the schematizations in (35), we can postulate that the object would extrapose to the specifier of some XP intermediate between TP and CP, which does not appear to be externally motivated. Second, the authors also do not explicitly state their proposal in terms that are superior to a verb-raising account (à la Clemens & Coon 2018), only pitting right-specifiers against predicate-raising. We would have to propose on our own how a default- or "basic"-VOS language like Kaqchikel could derive its word order (without predicate-raising) without resorting to an approach such as advanced by Otaki et al. (2019). A Kaynian counter-proposal to Otaki et al. would be to simply claim that the verb moves above the subject via head-movement and then the object then independently moves above the subject (perhaps to have absolutive case licensed). Third, it remains to be seen how this account can be reconciled with the fact that Kaqchikel, a obeys the ECC (36). In order to successfully extract ergative subjects, a special Agent Focus morpheme *-o* 'AF' is required. In the schematization above in (35), the object never acts as an intervener between T^0 and the subject, which would be required to drive the extraction asymmetry.

(36) Kaqchikel EEC (Henderson & Coon 2018, p. 150)

a. *Achike x-Ø-u-löq'$_{\text{TV}}$ ri äk'?
who CP-A3SG-E3SG-buy DET chicken
Intended meaning: 'Who bought the chicken?'

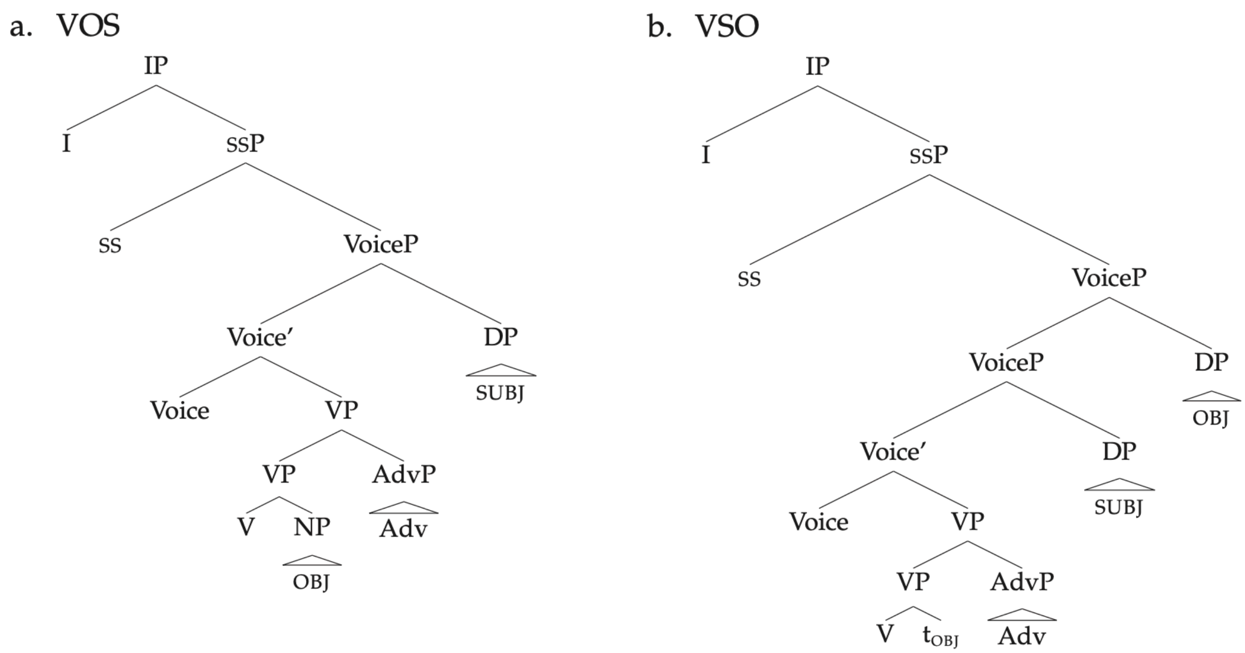
b. Achike x-Ø-löq'**-o**$_{\textbf{AF}}$ ri äk'?
who CP-A3SG-E3SG-buy-AF DET chicken
'Who bought the chicken?'

In sum, the argumentation by Otaki et al. (2019), while intriguing, does not present as complete a picture, and is not theoretically satisfactory. Further argumentation for the right-spec approach is found in Little's (2020) re-evaluation of Ch'ol clausal syntax, discussed below.

4.4.2 Little (2020b)

For Tumbala' Ch'ol, Little (2020b) advances five argumets for right-side specifiers account, and then extends the analysis to fixed VSO languages (such as, e.g. Mam). The first piece of evidence used in favor of the right-spec account is that in Ch'ol, adjuncts such as adverbs may not intervene between the verb and an NP object. Recall that Ch'ol is a VOS/VSO-alternating language where NP objects force VOS and DP objects force VSO (see 13-14 above). Little (2020) formalizes the difference between the V-O-XP-S order for NP objects and V-XP-S-O order for DP objects by postulating that adjuncts are right-adjoined to VP in a right-specifier structure.

(37) Differential position of adjuncts in Ch'ol (Little 2020b, #276)



The second piece of evidence comes from binding, where it appears that objects may bind into their subjects (38). Such an interpretation would not be predicted to be possible if the object did not c-command the subject, indicating that it had moved above the subject.

(38) Ch'ol (Little 2020b, #275)

Ta'	i-xul-u	t_i	[$_S$ i_i-yum]	[$_O$ ixä machity]$_i$
PFV	A3-break-TV		A3-owner	that machete

'Its$_i$ owner broke that machete$_i$.'

The interpretation of certain objects serves as the third piece of evidence. If an object with a numeral modifier appears in a low position (i.e. next to the verb), a low scope indefinite reading is possible; if that same numeral-modified object appears in a higher position (assumed to have moved above the subject), then it has a specific interpretation (39).

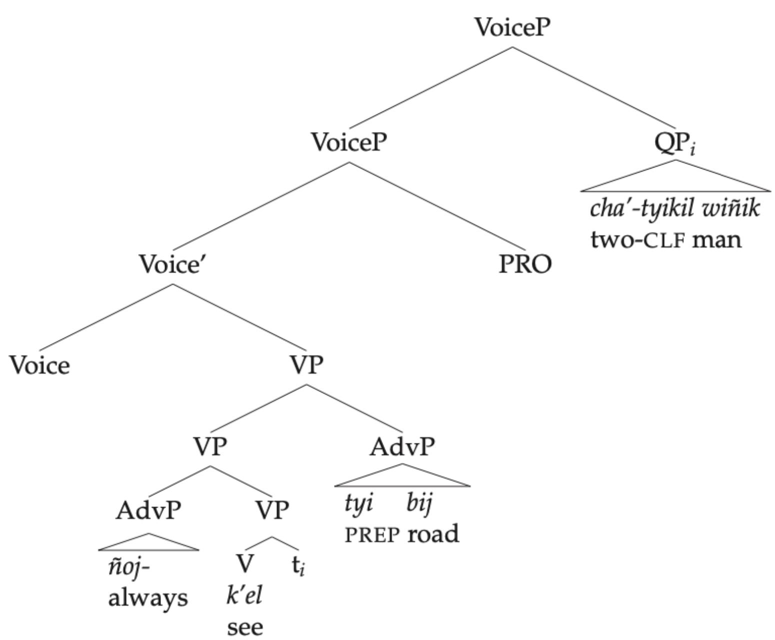
(39) Ch’ol (Little 2020b, #277)

a. Mi k-ñoj-k’el [**cha’-tyikil** **wiñik**] tyi bij
IPFV A1-always-see two-CLF man PREP way
‘I always see two men on the road’
✓It’s always the same two men (*ñoj* > 2)
✓It doesn’t matter which men (2 > *ñoj*)

b. Mi k-ñoj-k’el tyi bij [**cha’-tyikil** **wiñik**]
IPFV A1-always-see PREP way two-CLF man
‘I always see on the road two men’
✓It’s always the same two men (*ñoj* > 2)
✗It doesn’t matter which men (2 > *ñoj*)

Under a right-specifiers account, these judgements are predicted, as the high object has moved out of the domain of existential closure and may not take low scope with respect to the quantifier *ñoj-* ‘always.’ This state of affairs is shown in (40) below.

(40) Ch’ol high object outside of the domain of existential closure (Little 2020b, #279)



The fourth piece of evidence comes from a subextraction asymmetry, whereby extraction of material from certain objects but not others is illicit. Specifically, it is shown that for Ch’ol, extraction out of VOS objects is grammatical, whereas extraction out of VSO objects is not. For Little (2020b), this asymmetry comes down to whether the object has moved or not, given the Freezing Principle. Under a right-side specifiers account, VOS objects do not undergo movement, and therefore subextraction from them is predicted; conversely, VSO objects necessarily move, and therefore should be islands for subextraction.

(41) Subextraction asymmetry in Ch'ol (Little 2020b, #203)

a.

cha'-kojty$_i$	ta'	i-k'el-e	[O t_i	wakax]	[S aj-Rosa]		
two-CLF	PFV	A3-see-TV		cow	NC-Rosa		

'Rosa saw *two* cows'

b.

***cha'-kojty**$_i$	ta'	i-k'el-e	[S aj-Rosa]	[O t_i	wakax]	
two-CLF	PFV	A3-see-TV	NC-Rosa		cow	

Intended meaning: 'Rosa saw *two* cows'

The final piece of evidence comes from the structure of progressives. In Ch'ol, progressives are formed by means of a progressive predicate which takes a nominalized complement (for an in-depth account, see Coon 2010b, 2012, 2013). As such, the verb, though intransitive, appears as if it is marked with ergative (Set A) marking.

(42) Ch'ol progressive (Little 2020b, pp. 144-145)

a.

Ta'	majl-i**-yoñ**
PFV	go-IV-B1

'I left'

b.

Woli	**k-**majl**-el**
PROG	A1-go-NML

'I am leaving' (lit. 'my going is happening')

The structure given in Coon's work is the following, where the DP possessor is introduced as the specifier of PossP, co-indexed with a PRO in the verbal complement, which has been nominalized as *n*P.

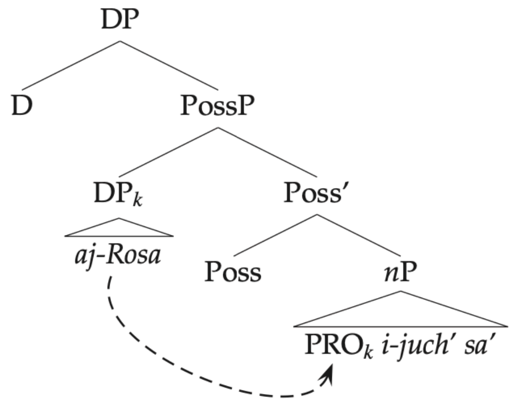
(43) Structure of the Ch’ol progressive (Little 2020b)

a.

Woli	i-juch’(-e’)	sa’	aj-Rosa
PROG	A3-grind-DEP	masa	NC-Rosa

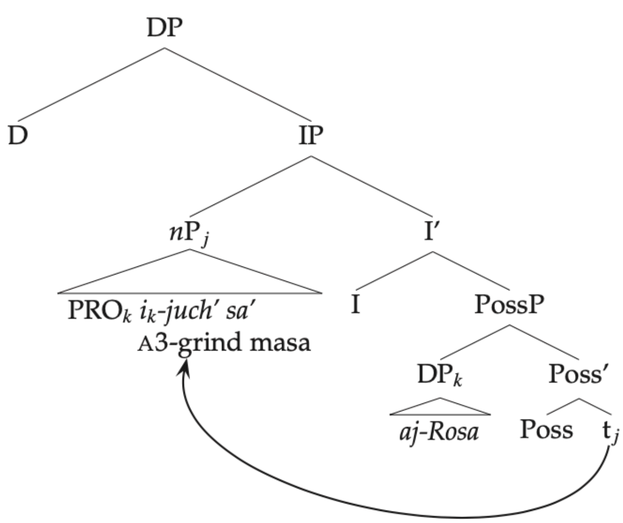
‘Rosa is grinding masa’

b.



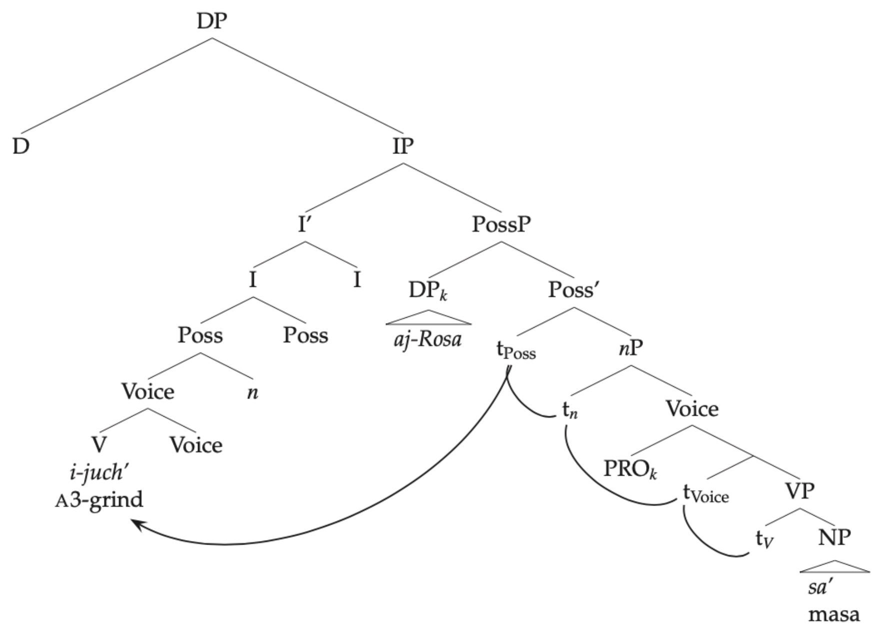
Under Coon’s (2010) predicate-fronting account, the subject in a progressive clause appears after the verb and object, which fronts to a position between PossP and DP, labelled TP/InflP.

(44) Little (2020b), referencing Coon’s (2013) possessive structure



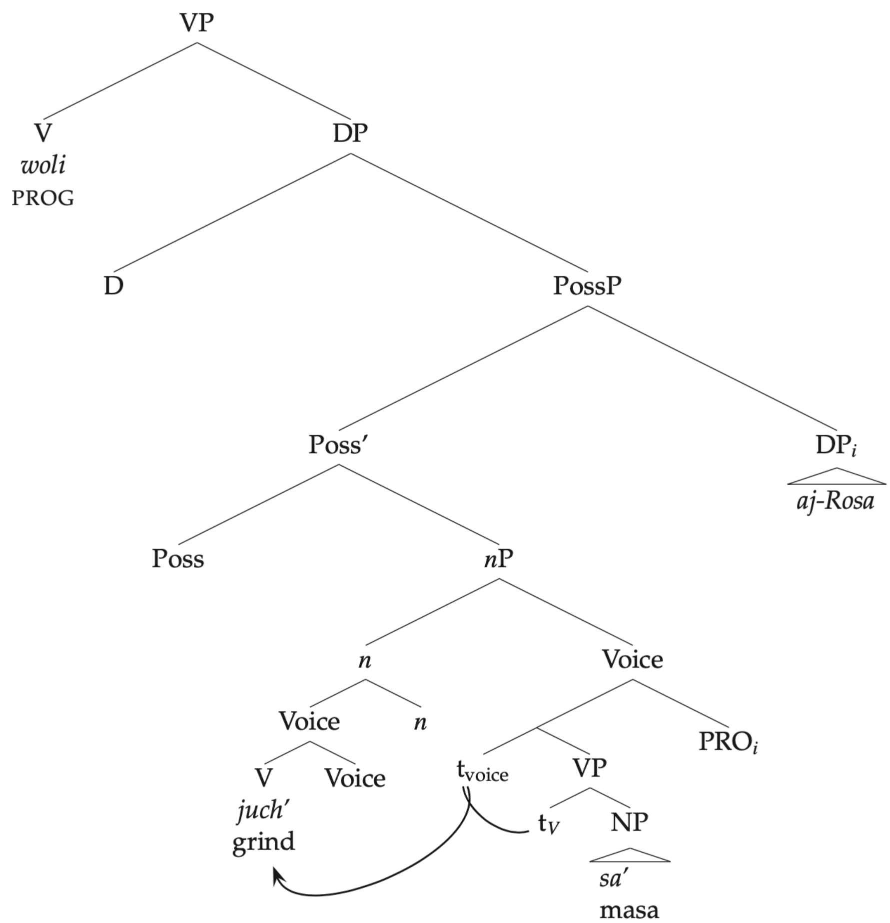
Little (2020b) explores how a similar proposal would have to be made under Clemens & Coon's (2018) verb-raising account: an intermediate layer of structure (TP/InflP) would have to be posited to project between the possessor and the nominalized verbal complement.

(45) Extension to Clemens & Coon's (2018) verb raising proposal (Little 2020, p. 147)



Above, we see the intermediate layer of structure is required to host the head which ultimately hosts the raised verb. Additionally, to achieve VOS word order, ARGUMENT-φ would have to take effect so that the object *sa'* 'masa' can be pronounced adjacent to the verb. Under Little's (2020) right-side specifiers account, however, there is no need for either piece of extra machinery. If, per Aissen (1992) the specifier of PossP is also to the right, then the correct word order is achieved without any additional functional projections or prosodic constraints such as ARGUMENT-φ.

(46) Right-side specifiers for the Ch’ol progressive (Little 2020b, p. 158)



In sum, we see that Little’s (2020b) proposal for right-side specifiers is theoretically powerful in that it can account for a variety of facts in Ch’ol with fewer syntactic assumptions. With this proposal in hand, she considers fixed-VSO Mayan languages and presents a proposal for how a right-spec approach would be advantageous for them as well.

There are two features uniting fixed-VSO Mayan languages. First, despite their rigid VSO word orders in discourse-neutral contexts, they do show VOS word order if the object is *reflexive*.

(47) Q’anjob’al: fixed-VSO but VOS in reflexives (Coon et al. 2014, p. 266)

a. Max y-il [$_O$ **s-b’a**] [$_S$ ix ix]
ASP A3-see A3-self CLF woman
‘The woman saw herself’

b. Max y-il [$_S$ ix ix] [$_O$ naq winaq]
ASP A3-see CLF woman CLF man
‘The woman saw the man’

Relatedly, it is also possible to extract the transitive agent if the object of the verb is a reflexive. In the rigidly VSO Q’anjob’al, for example, the AF morpheme *-on*, which is otherwise used in ergative extraction, is illicit if the object is reflexive, as in the following (see also (Pascual 2007).

(48) Q’anjob’al: ergative extraction possible if object is reflexive (Coon et al. 2014, p. 277)

a. Maktxel max y-il **s-b’a**?
Who ASP A3-see A3-self
‘Who saw herself?

b. *Maktxel max y-il-**on**[-i] **s-b’a**?
Who ASP A3-see-**AF**-ITV A3-self
Intended meaning: ‘Who saw herself?’

Second, all fixed-VSO Mayan languages happen to be syntactically ergative: they all obey the EEC. It is important to note, however, that not the case that this implication goes in the other direction: not all syntactically ergative Mayan languages are fixed-VSO.

(49) Q’anjob’al is syntactically ergative (Coon et al. 2014, p. 192)

a. Maktxel$_i$ max way-i t$_i$?
Who ASP sleep-IV
‘Who slept?

b. *Maktxel$_i$ max y-il-a’ t$_i$ naq winaq?
Who ASP ASP-see-TV CLF man
Cannot mean: ‘Who saw the man?’
Grammatical as: ‘Who did the man see?’

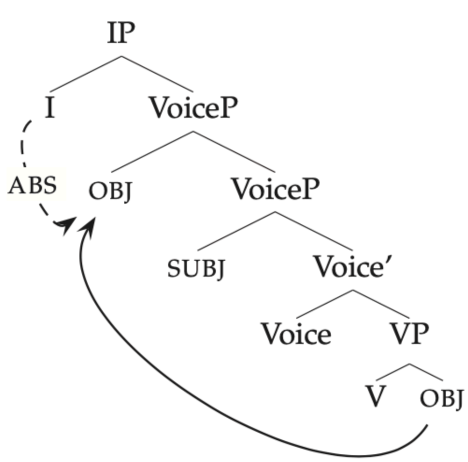
The languages listed as fixed-VSO, which are expected to share these properties, are given below, from England (1991, p. 451).

(50) Mayan languages with fixed VSO (England 1991, p. 451)

a. Mam
b. Tektitek (Teko)
c. Awakateko
d. Ixil (Nebaj, Chauj dialects)
e. Q'anjob'al
f. Popti' (Jakaltek)
g. Chuj (San Sebastián dialect)

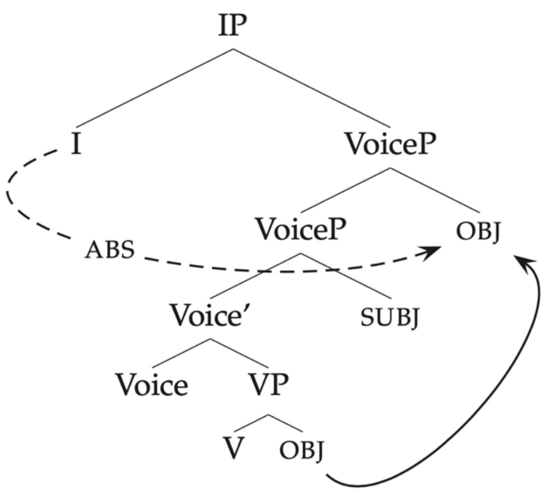
How can right-sided specifiers account for both features of these languages (VOS in reflexives and syntactic ergativity)? First, we can address the question of syntactic ergativity. In keeping with the traditional Mayanist view of syntactic ergativity, the object moves above the subject to check absolutive case with T^0 and therefore "traps in" the subject, which is then unable to extract out. Languages where this state of affairs is in evidence are called *high-absolutive*, as opposed to *low-absolutive* languages where objects are case-licensed low by v^0. Under this mainstream view, this object movement in high-abs languages is *covert*, not affecting surface word order (which must remain VSO). Evidence of object movement is still clear, as syntactic ergativity is in evidence, and Set B (absolutive) marking appears local to T^0.

(51) Syntactic ergativity in high-abs languages (Aldridge 2004, 2008; Coon et al. 2014)



Little (2020b) proposes that, instead of covert, leftward movement of the object above the subject, object movement is overt and rightward. On this approach, the object still intervenes between T^0 and the subject, triggering EEC effects. This proposal, within a right-side specifiers account, therefore links fixed-VSO word order and syntactic ergativity.

(52) Overt object movement and absolutive case in fixed-VSO (Little 2020b, p. 175)



On this approach, reflexive objects are posited *not* to undergo rightward postposing like other objects. It is reflexive objects specifically which do not move because it is precisely those objects which must be bound locally by their antecedents in their base positions as complements to V^0. Consequently, they are not able to move above the subject, which means that they do not compete for case: as such, sentences with reflexive objects are not subject to ergative extraction restrictions.

This analysis is highly explanatory, and makes a number of key predictions concerning the nature of objects in fixed-VSO languages such as Mam, summarized in (53) below. We will see Chapter 3, however, that these predictions are not borne out conclusively in Todos Santos Mam.

(53) Predictions of right-side specifiers account for fixed-VSO languages

Feature	*Prediction*
Binding	Objects predicted to bind into subjects
Scope	Objects predicted to have specific, definite interpretations
Definiteness	Objects predicted to be always definite
Subextraction	Objects predicted to be islands for subextraction

4.4.3 Scott (2023)

The proposal advanced by Little (2020) is taken up by Scott (2023) (who bases the proposal on earlier work: see Scott & Sales 2021) for the fixed-VSO Mayan language Mam specifically, and as such is particularly relevant for the present discussion.

The variety of Mam surveyed by Scott (2023) is San Juan Atitán (SJA) Mam, which is a Northern Mam variety. Unlike the Mam varieties which have been documented most extensively in the literature, SJA Mam does not cross-reference the person and number features faithfully within the verbal complex, that is, with Set B morphology. Instead, the Set B morpheme used is always a "default" morpheme (to use Scott's terminology), which happens to be the 3rd person singular morpheme (more specifically 2/3rd person, since them two persons are syncretic in Mam, but as it is default agreement, 3rd person is the crucial value here). Features of the object are realized in a low pronoun in VSO object positon, which is shown to be a fairly recent innovation. Scott refers to this state of affairs as "Default Set B," and contrasts it with the "expected" Set B agreement seen in more conservative varieties such as San Ildefonso Ixtahuacán Mam. (Indeed, SJA Mam speakers are able to produce and judge grammaticality for "expected" Set B sentences, but judge it to be more formal or prescribed). For concreteness, I will compare the Set B morphology in both Ixtahuacán and SJA Mam below in (54). Blue coloring indicates expected Set B; red indicates expected Set A; plain bolding indicates "default" agreement with the low pronoun.

(54) Ixtahuacán agreement pattern ("expected Set B") (England 1983b)

a. ma **chin** b'eet=a
PROX B1S walk=LP
'I walked'

b. ma **chin** ok **t-**tzeeq'a-n=a
PROX B1S DIR A2/3S-hit-DS=LP
'You hit me'

(55) SJA Mam agreement pattern ("default Set B") (Scott & Sales 2021)

a. ma **chin** b'et=i
PROX B1S walk=LP
'I walked'

b. ma **tz'-**ok **t-**ke'y-an Lucrecia **qin=i**
PROX B2/3S-DIR A2/3S-see-DS Lucrecia 1SG.PRO=LP
'Lucrecia saw me'

In Ixtahuacán Mam, the object is faithfully cross-referenced as Set B morphology, as it is for intransitive subjects. In SJA Mam, the Set B morpheme for intransitive subjects is faithful to the feature values of the subject, but not for objects. Instead, the Set B morpheme used to cross-reference objects is always the 2/3rd person morpheme. In (55b), the object is 1ps, but the Set B morpheme does not faithfully reflect that. The features of the object, not being expressed by Set B morphology, are instead pronounced as a low pronoun in VSO object position.

The important advancement made by Scott (2023) is that although SJA Mam is in all other respects a high-absolutive language (the Set B marker occurs before the verb/Set A marking and it obeys the EEC), it does not appear to be the case that there is actually an agreement relationship *per se* between the transitive object and T^0. That is, if the object had moved above the subject for case reasons (the expectation for a high-absolutive language), we would expect the Set B marker to cross-reference the features of the object, but this is not seen. Instead, the object must be able to move above the subject (thus triggering EEC effects) *without* getting case from T^0. The following example shows the EEC effect in action: while a transitive subject may not extract (56a) from a transitive clause, it may extract if the clause is formally intransitive (i.e. in the antipassive voice) (56b). In the SJA Mam antipassive, the clause is intransitive, and the object is demoted to an oblique phrase introduced by a relational noun ('RN').

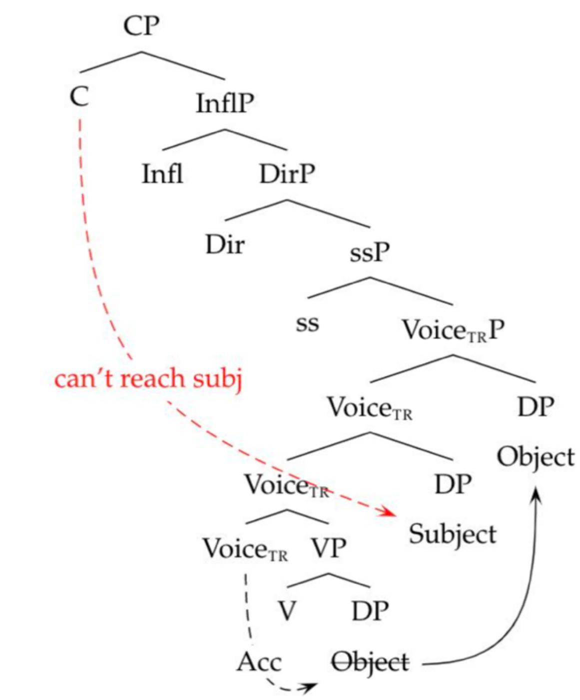
(56) SJA Mam obeys EEC: evidence for object shift (Scott & Sales 2021)

a. *A'l$_i$ ma tz'-ok t-b'yo-'n t$_i$ qin=i?
Who PROX B2/3S-DIR A2/3S-hit-DS 1SG.PRO=LP
Intended meaning: 'Who hit me?'

b. A'l$_i$ ma tz'-ok b'yo-n=ta t$_i$ qin=i?
Who PROX B2/3S-DIR A2/3S-hit-AP=RN 1SG.PRO=LP
'Who hit me?'

From the fact that SJA Mam obeys the EEC, it is concluded that object movement has taken place, however this must be reconciled with the fact that this movement cannot be for case reasons. They propose instead that object movement occurs to check an [EPP] feature with *v*/VoiceP (57), and are licensed where they land by v^0/Voice^0.

(57) Overt object movement in SJA Mam (Scott & Sales 2021, sl. 57)



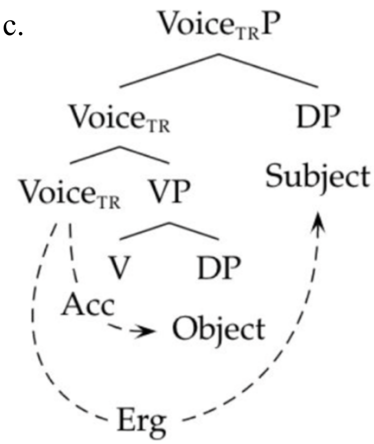
To prove the point that it is *v*/VoiceP, not TP, which licenses objects, the authors present evidence that these low objects are licensed even when there is no TP present in the structure. Specifically, various psych-verbs in Mam matrix clauses do not allow for there to be any aspect marking *or* for there to be any High Set B alternative (58). These clauses are therefore proposed to be simply VoiceP's, lacking TP structure, in which Voice^0 both licenses the object (assigning it accusative case) and assigns the subject ergative case as would otherwise be expected.

(58) Lonely VoiceP's in SJA Mam (Scott & Sales 2021, slsl. 73-75)

a. T-tzqin Jse qin=i
A2/3S-know José 1SG.PRO=LP
'José knows me'

b. *Chin t-tzqin Jse
B1S A2/3S-know José
Intended meaning: 'José knows me'

c.



This proposal leads to a configuration where SJA Mam does not have a typical ergative-absolutive alignment, but rather is tripartite, where T^0 only licenses case to intransitive subjects.

(59) Tripartite alignment for SJA Mam (Scott & Sales 2021, sl. 95)

a. Nominative – Intransitive subjects (T^0/$Infl^0$)
b. Ergative – Transitive subjects (Voice_{TR})
c. Accusative – Transitive objects (Voice_{TR})

The intervention effect which drives the EEC in SJA Mam, then, is not considered to be one of case-licensing, but rather simply one of movement. Scott (2023) propose that regardless of a Mayan language's status as high- or low-absolutive, and regardless of which head (T^0 or Voice^0) licenses objects, it will be sensitive to the EEC *if its object has moved over the subject*.

The choice of a right-side specifiers account is chosen for SJA Mam over some other account narrows down to three factors for Scott (2023): i) object movement must occur in order to drive Mam's EEC effects, and overt movement is theoretically advantageous; ii) a verb-raising account à la Clemens & Coon (2018) wrongly predicts intransitive syntax for reflexive constructions; and iii) right-spec syntax captures the supposed historical evolution of the word order from Proto-Mayan to Mam. While the first point has already been discussed in some detail above, the second two points warrant some discussion.

First, on the point that verb-raising predicts intransitive syntax in reflexives. Recall that in fixed-VSO Mayan languages like Mam and Q'anjob'al, VOS word order is exceptionally required if the object is reflexive. Whereas in Little (2020b), VOS reflexive order is a result of the reflexive object remaining low and not raising due to binding conditions, for Clemens & Coon (2018), VOS reflexive word order is a result of pseudo-noun-incorporation (PNI), due to reflexive objects being bare NPs, lacking D^0-level material. PNI constructions cross-linguistically are *intransitive* constructions, in which the (necessarily non-specific, non-referential) object is not actually a verbal *argument*, as the verb is marked intransitively. In certain VSO languages, we find so-called *incorporation antipassives* such as (60), which are reminiscent of PNI, and also require VOS word order.

(60) Q'anjob'al incorporation antipassive (Clemens & Coon 2018, p. 254)

a.	Max	s-tzok'	[S naq	winaq]	[O te'	si']	(transitive)
	PFV	A3-chop	CLF	man	CLF	wood	

'The man cut the wood'

b.	Max	tzok'-w-i	[O si'	]	[S naq	winaq]	(incorporation antipassive)
	PFV	A3-chop-AP-SS	wood		CLF	man	

'The man cut wood'

As such, reflexive objects, which are also bare NPs, and trigger VOS word order, are also predicted to trigger intransitive syntax. That is, when the verb raises in a reflexive clause, it really should be $V^0[v^0+n^0]$ fronting. This is not borne out in Mam. As Scott & Sales (2021) show, reflexives are marked transitively (61). (This is also the case for Todos Santos Mam; see Chapter 2).

(61) SJA reflexive clauses are transitive (Scott & Sales 2021, sl. 108)

a.	n-**Ø-**ewan	t-ib'	Jse	(intransitive root)
	INC-B2/3S-hide	A2/3S-self	José	

'José is hiding himself'

b.	o	**Ø**-kub'	**t-**qesan	t-ib'	Jse	(transitive root)
	COM	B2/3S-DIR	A2/3S-cut.DS	2/3S.B-self	José	

'José cut himself'

The final point made by the authors in favor of the right-side specifiers account is that it reflects the historical development of the word order seen today in Mam and other fixed-VSO Mayan languages from its historical predecessor Proto-Mayan, which is considered to have been a VOS/VSO-alternating language (e.g. Norman & Campbell 1978). In Proto-Mayan, features of the object controlled which word order was chosen: VOS was the baseline; however, when the object was definite or animate, VSO was used. Per England (1991), fixed-VSO languages like Mam generalized the more marked VSO word order from Proto-Mayan as the default word order. According to Scott (2023), the syntactic machinery that derived VSO from baseline VOS in Proto-Mayan could be the same as still seen today in Mam, which can be easily accounted for under a right-side specifiers account.

It is useful to compare this line of reasoning with Clemens & Coon's (2018) verb-raising-cum-prosodic-reordering approach. Per Clemens & Coon, VSO is the baseline word order, and VOS is derived when the object is a bare NP; this is essentially the reverse of the tack taken by Little (2020b) and Scott (2023), and does not reflect the historical development from Proto-Mayan. Scott & Sales (2021) argue that if VSO had been available in Mayan since Proto-Mayan, the innovation in fixed-VSO languages is not that a language generalized DP-object postposing, but rather that it lost the bare-NP prosodic reordering rule (i.e. it re-ranked ARGUMENT-φ lower). If this latter point is correct, there is no historical explanation as to why, whereas generalization of the DP-object postposing rule is more readily explainable. Then again, I would generally advise caution when basing arguments for synchronic grammar on diachronic development, as the rules which make up a living speaker's grammar in, say, Mam, need not reflect the rules in Proto-Mayan.

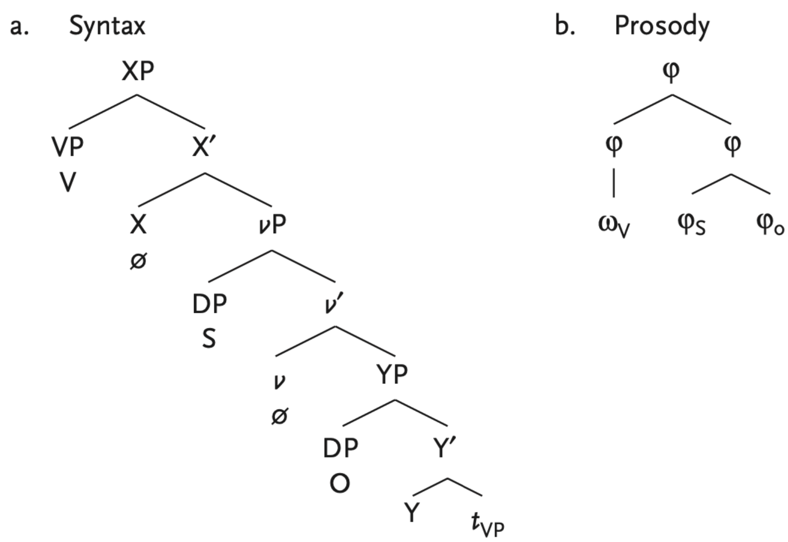
5 Prosodic predictions for fixed-VSO languages

The preceding section outlined the unique proposals for verb-initial syntax: predicate raising (Coon 2010b), verb raising (Clemens & Coon 2018), and right-side specifiers (Otaki et al. 2019, Little 2020b, Scott 2023). Each of these proposals has been used to account for VOS and VSO syntax in Mayan languages. However, given our understanding of the syntax-prosody interface, as mediated by Match Theory (Selkirk 2009, 2011), each of these three accounts makes distinct predictions for the prosodic phrasing of clauses, which can be tested experimentally. That is, we can look to prosodic evidence as an additional lens to argue for or against one of these three proposals for the syntax of a given language. In this section, I will highlight how each of the proposals given above in §4 would be expected to spell out prosodically, making specific reference to VSO, as this will be most relevant to rigidly VSO Mam, the language under discussion in this dissertation.

5.1 VP remnant raising

Recall that in a predicate-raising account of V1, the entire XP containing the verb and the object moves to a position hierarchically superior to the subject. In order to yield VSO order specifically, the object must first evacuate to some position, and then the rest of the remnant moves to that anterior position (*VP remnant raising*). VP remnant raising is the proposal for Ch'ol's VSO syntax presented by Coon (2010b), and for other languages such as Niuean (Massam 2010). This approach to VSO makes a specific prosodic prediction, specifically that the verb itself, which is contained within the VP (or whichever XP fronts to initial position), should be contained within a phonological phrase φ. The subject and the object phrases should also spell out as φ's. Each syntactic element, then (V, S, and O) should all map to φ, all else being equal. A schematization of the syntax-prosody relation for languages such as thesse is given in (62) below.

(62) Syntax-prosody mapping of predicate-raising VSO (Clemens 2021, p. 76)



In the schematization above, despite the verb itself just being a prosodic word ω, it is still ultimately pronounced as a φ-phrase due to the fact that it is within a VP/XP. We should expect, then, to see evidence of this in a production experiment: phonetic/phonological/prosodic cues marking φ-phrases should be expected to also mark the verb, if VSO word order is derived from remnant raising, all else being equal. Additionally, we can predict that in VSO derived from remnant raising, the subject and the object will form a larger prosodic constituent to the exclusion of the verb. In the diagram in (62b) above, this is shown by the fact that φ_S and φ_O are both contained in a recursive φ-phrase that contains both of them. As there is more prosodic structure here, we can expect a relatively large prosodic boundary to intervene between the verb and the subject as compared to that intervening between the subject and the object (63).

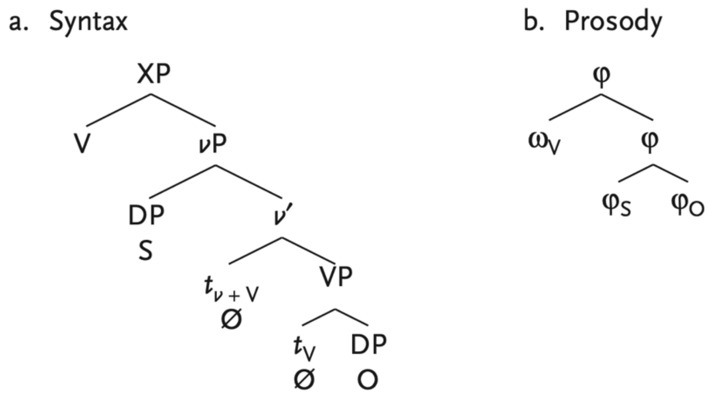
(63) Predicate-raising prosodic structure

$(V)_\varphi$ **[** $(S)_\varphi$ $(O)_\varphi$ **]**$_\varphi$

5.2 Verb-raising

Next we can look at the prosodic predictions of a verb-raising account of VSO word order. Recall that under a verb raising account, there is no phrasal movement, but just the verb head which moves above the subject with the object remaining low and unmoved. This is the proposal for Ch'ol/pan-Mayan VSO syntax given in Clemens & Coon (2018) and assumed in much subsequent work on Mayan (e.g. Royer 2022). This approach differs from the remnant raising approach in its prosodic predictions as well, given that on that approach, the verb will be spelled out as a φ-phrase because it is contained in an XP, whereas on the verb- aising approach, it will only be spelled out as a prosodic word ω because only the head has moved.

(64) Syntax-prosody mapping of verb-raising VSO (Clemens 2021, p. 77)



As such, despite the quite distinct syntactic differences between predicate-raising and verb-raising routes to VSO, the prosodic differences are rather minimal: under verb-raising, the verb is spelled out simply as a prosodic word instead of as a phonological phrase, as it would be under a remnant raising account. On both approaches, the subject and the object are likewise both predicted phrase together into a prosodic constituent, to the exclusion of the verb.

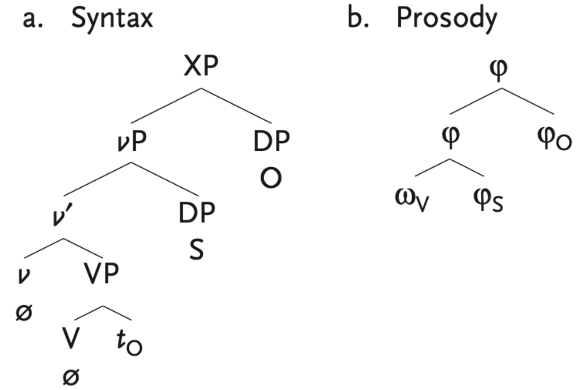
(65) Verb-raising prosodic structure; compare with (63)

$(\mathrm{V})_{\omega}$ **[** $(\mathrm{S})_{\varphi}$ $(\mathrm{O})_{\varphi}$ **]**$_{\varphi}$

5.3 Right-side specifiers

Finally, we can compare the prosodic predictions of a right-side specifiers approach to VSO. The prosodic spellout of this route to VSO differs significantly from the previous two approaches, in that it predicts prosodic a grouping of the verb and the subject to the exclusion of the object, which has postposed to the specifier of a higher XP.

(66) Syntax-prosody mapping of right-side specifiers VSO (Clemens 2021, p. 75)



On this approach, the recursive prosodic constituent chunk is predicted to contain the verb and the subject XP's φ-phrase. The object XP, which has extraposed, is separated from the subject by a strong prosodic boundary. For Clemens & Coon (2016), a strong prosodic boundary indicates a significant pause, and could also indicate a pitch reset.

(67) Right-side specifiers prosodic structure

$[\ (V)_{\omega}\ (S)_{\varphi}\ ]_{\varphi}\ (O)_{\varphi}$

5.4 Potential confounds: differentiating verb raising from remnant raising

To summarize from the last few sections, below are the three potential prosodic profiles of VSO sentences, given their differential syntactic inputs.

(68) Potential prosodic profiles for a VSO language

a. Remnant raising: $(V)_{\varphi}\ [\ (S)_{\varphi}\ (O)_{\varphi}\ ]_{\varphi}$
b. Verb raising: $(V)_{\omega}\ [\ (S)_{\varphi}\ (O)_{\varphi}\ ]_{\varphi}$
c. Right-side specifiers: $[\ (V)_{\omega}\ (S)_{\varphi}\ ]_{\varphi}\ (O)_{\varphi}$

Note that of the three profiles above, the two which are most similar are the VP remnant raising and verb raising ones (68a and 68b). They differ only in whether the verb is realized as a phonological phrase φ (former) or a prosodic word ω (latter). In her review of V1 syntax-prosody, Clemens (2021) groups these together and calls them "verb-movement" accounts. Grouping them together is important, because in practice, it is often difficult to find evidence for prosodic structure which looks like (68b), thanks to three common eurhythmic (wellformedness) considerations which may force an initial ω to appear as a φ. That is, what should be a prosodic word, given a strong syntax-prosody isomorphism, is instead often realized as a phonological phrase thanks to the higher ranking of any one of these eurhythmic constraints.

The first eurhythmic consideration is STRONGSTART (Werle 2009, Selkirk 2011, Elfner 2012, 2015, Bennett et al. 2016), which was discussed briefly in §4.3. It has often been observed that languages disprefer a prosodic constituent to have a leftmost daughter constituent which is lower on the prosodic hierarchy than the constituent which immediately follows it. For example, STRONGSTART would penalize a prosodic output such as $*(\omega\ \varphi)_\iota$, as the leftmost daughter of the intonational phrase ι is lower on the prosodic hierarchy than its right-hand sister ($\omega \prec \varphi$). The definition is repeated in (69).

(69) STRONGSTART (as defined in Selkirk 2011)
  a. A prosodic constituent optimally begins with a leftmost daughter constituent that is not lower in the prosodic hierarchy than the constituent that immediately follows.
  b. Assess a violation on any output form which violates the proposition in (a).

For our purposes, STRONGSTART would penalize a faithful mapping from verb-raising VSO syntax onto prosody, whereas it favors a faithful mapping from remnant raising VSO syntax onto prosody. This is because the first daughter constituent of the highest node is just a prosodic word, and its sister is a phonological phrase, which is a *weak start* (compare 68a with 68b). In order for the STRONGSTART-violating parse in (68b) to satisfy the constraint, the phonological component would have to promote the initial prosodic word to a phonological phrase; this would not just be a syntax-prosody mismatch, but would also make the sentence appear as if it were mapped from a predicate-raising syntactic structure.

The second eurhythmic constraint which would force nonisomorphism is EQUALSISTERS (Myrberg 2010, 2013; Bennett et al. 2016). This constraint prefers nodes whose daughter nodes are instantiations of the same prosodic category (hence *equal sisters*), which is a cross-linguistically observed phenomenon.

(70) EQUALSISTERS (as defined in Myrberg 2013)
  a. Sister nodes in prosodic structure are instantiations of the same prosodic category.
  b. Assess a violation on any output form which violates the proposition in (a).

Like STRONGSTART, EQUALSISTERS will penalize the prosodic structure in (68b), assuming it is highly ranked. This is because the verb, parsed into just a prosodic word ω, is not an equal sister to the φ which contains the subject and the object. On the other hand, it will not penalize the prosodic structure in (68a), as the XP, contained in a φ, is parsed into the same prosodic constituent as its sister.

Lastly, Clemens (2021) points out that a language's maximal size requirements may play a role in driving an initial ω to become a φ. Under a verb raising account, the head-moving verb is assumed to be realized as a single ω, although it may not if it has accumulated too much material. Several languages have been shown to have maximal size requirements on prosodic words (e.g. DeLacy 2004, Kentner 2006, Itô & Mester 2007). As such, a too-large ω could be forced to be pronounced as a φ due to a language-specific maximality constraint.

In sum, there are three eurhythmic conditions which could, if highly ranked, cause an initial prosodic word to promote to a phonological phrase. If that is the case, the verb raising syntax-prosody mapping would look identical to the VP remnant raising syntax-prosody mapping. In the face of this potential confound, Clemens (2021) emphasizes the importance of: i) amassing independent prosodic evidence supporting or rejecting the existence of eurhythmic considerations on a language's prosodic spellout; and ii) gathering extra syntactic evidence in support of whichever prosodic profile appears most likely for a given language.

In Mam, this discussion is of particular importance because the "V" constituent may be complex, as a clause may contains both a directional and a verb: DVS(O). As such, we may expect that when a directional is present, it and the verb may phrase together, forming a constituent in satisfaction of STRONGSTART, whereas without a directional, the verb will phrase by itself, or with the subject, better reflecting syntax-prosody isomorphism. To briefly look ahead to the findings from Chapter 4, the verb and the directional do not phrase together as a φ, indicating that S-P mapping constraints are ranked higher than the wellformedness constraints discussed here.

CHAPTER 2

A grammatical sketch of Todos Santos Mam

1 Introduction

This section presents a grammatical sketch of the Todos Santos dialect of Mam, spoken in the municipality of Todos Santos, Cuchumatán, Guatemala. Todos Santos is a Northern Mam dialect (Canger 1968, England 1983b), and as such has a number of similarities to certain other dialects described in the literature, such as Ixtahuacán Mam (England 1983a,b, *et seq.*) and San Juan Atitán Mam (Scott 2023). England (2017) has described the Mam of Todos Santos as the "most divergent" variety of Northern Mam, perhaps due to its innovation of a number of novel phonemic contrasts, its lexical divergence from the Ixtahuacán "standard", as well as its tripartite morphosyntactic alignment (although this latter characteristic is actually not unique to Todos Santos and may be representative of a broader trend among Northern varieties).

Up until now, the most complete resource for descriptive linguistic information concerning Todos Santos Mam has been Canger (1968), which is written in the archaic *glossemic* framework. While the data in that dissertation is exceptionally well documented, the analysis must be brought under a modern linguistic lens. This is the first of two main aims in this chapter. The second is to outline all of the grammatical characteristics of Mam (and Todos Santos Mam, specifically) which the reader may wish to be familiar before reading further analytical chapters later on in this work. Following the example of Scott (2023), this chapter is structured to roughly follow the outline of of Mam grammar presented in England (2017). This way, those interested in comparative Mam dialectology can more easily compare across Mam varieties, as the sections in each work are roughly equivalent in structure.

Data for this section, and indeed the data for this entire dissertation, was elicited from several native Todos Santos Mam speakers in Los Angeles and Oakland in the US, either in person or over a videoconferencing platform, and in person in Todos Santos, Cuchumatán, Guatemala.

Data collection began in January of 2021 and continues through time of writing. Data was collected in structured elicitation sessions as well as collected through oral texts.

§2 discusses phonology: consonant and vowel inventories, phonological processes, and incipient tone. §3, on “words and phrases,” includes discussion of noun phrases, verb phrases (including each element of the verbal complex), positionals, and relational nouns. §4 discusses clause structure, and touches on word order, alignment, and voice/valence. §5, which following England we may call “complex structures”, discusses embeddings and split ergativity. A new section not seen in England, §6, treats with extraction syntax and questions. §7 concludes.

2 Phonology

2.1 Inventory: consonants and vowels

Todos Santos Mam has 38 phonemes: 28 consonants and 10 vowels. Todos Santos Mam is distinct from other Mam varieties – even closely related Northern varieties – for its innovation of an apico-post-alveolar series of consonant phonemes which alternate with the post-alveolar series. It has also lost the palatal stop and affricate, which are present in other varieties (England 2017, p. 501). In addition to 28 native consonants, we also find loan words (mostly from Spanish) which contain the consonants [b d r g], which are not considered phonemic. There is also a phonemic length contrast in the vowel system.

Table 2: Consonant phonemes

	bilabial	dental	alveolar	post-alv.	apico.	retroflex	palatal	velar	uvular	glottal
plosive	*p* [p]	*t* [t]						*k* [k]	*q* [q]	*’* [ʔ]
affricate			*tz* [ts]	*ch* [tʃ]	*tch* [tʃ̺]	*tx* [ʈʂ]				
glot.	*b’* [ɓ̥]	*t’* [t’]	*tz’* [ts’]	*ch’* [tʃ’]	*tch’* [tʃ̺’]	*tx’* [ʈʂ’]		*k’* [k’]	*q’* [ʛ̥]	
fricative		*s* [s]		*xh* [ʃ]	*sh* [ʃ̺]	*x* [ʂ]			*j* [χ]	
nasal	*m* [m]	*n* [n]								
tap										
approx.	*w* [w]	*l* [n]					*y* [j]			

Table 3: Vowel phonemes

	front	central	back
high	*i* [i]		*u* [u]
mid	*e* [i]		o [o]
low		*a* [a]	

short vowels

	front	central	back
high	*ii* [iː]		*uu* [uː]
mid	*ee* [eː]		*oo* [oː]
low		*aa* [aː]	

long vowels

An official Mam orthography was adopted for Mam in 1991 through La Academia de Lenguas Mayas de Guatemala (ALMG; English: *Guatemalan Academy of Mayan Languages*), an organization that regulates the use of indigenous languages within Guatemala. ALMG attempted to create an orthography that would be applicable to all 22 Mayan languages spoken in Guatemala, Mam being just one of them. This pan-Mayan orthography has a number of shortcomings, however, due to which I will be diverging slightly from ALMG conventions in this dissertation. First, it does not transcribe vowel length, which is contrastive in Mam and plays a significant role in Todos Santos morphophonology; therefore, I will transcribe vowel length here. Second, ALMG takes no official stance on the apico-palato-alveolar series of consonants unique to Todos Santos Mam, considering them to simply be regional variants, and not offering an official orthographic convention for rendering them. The organization Comunidad Lingüística Mam (COLIMAM; English: *Mam Linguistic Community*), a branch of the ALMG regulating Mam conventions specifically, does not mention these consonants in its 2010 dictionary (COLIMAM 2010). Following the informal convention in Sitler (2002), and following consultation with native speakers, I render the apico-post-alveolars [tʃ̺ tʃ̺’ ʃ̺] as <*tch tch’ sh*>, respectively. Third, following all work by Nora England, I will render the post-alveolar fricative as <*xh*>, and not as <*ẍ*>, for typographical convenience, although the latter is often used in Todos Santos.

2.2 Incipient tone

As was initially noted for Ixtahuacán Mam by England (1983b, p. 35), there is a distinct pitch difference between certain vowels which are followed by glottal stops and vowels which are not followed by glottal stops. In Ixtahuacán Mam, England reports that long vowels are realized with falling pitch (which she represents by the '↘' symbol) if they are followed by an underlying (phonemic) glottal stop; additionally, the glottal stop is not realized with actual glottal stricture. On the other hand, short vowels followed by glottal stop are unaffected (1).

(1) Realization of post-glottalized vowels in Ixtahuacán Mam (England 1983b, p. 35)

a.	[ˈʔiʔ.tsəl]	*I'tzal*	'Ixtahuacán'
b.	[siː↘]	*sii'*	'firewood'

While an example of a word-final short vowel followed by a glottal stop is not explicitly given by England along with these examples in (1), we can assume, given by her generalization, that word-final Vʔ sequences would behave just like word-medial Vʔ sequences (1a), that is, without the phonemic glottal stop being realized simply as falling pitch.

In Todos Santos Mam, the picture is about the reverse. In Kuo & Elkins (2022), we find that it is only word-medially that Vʔ sequences are realized with falling pitch, without glottal stricture. These sequences are also realized with significantly creaky phonation and are lengthened: these are the surface correlates of an underlying glottal stop. Word-finally, however, Vʔ sequences are realized as a sequence of a vowel followed by a full, consonantal glottal stop, with no falling pitch. (Near-)minimal pairs are given in (2)-(3).

(2) Short vowels: flat pitch

/a/	[tal]	*tal*	'her son'
/e/	[ʂew]	*xew*	'blue, purple'
/i/	[wiʃ]	*wixh*	'cat'
/o/	[tʃχɔ̃]	*chjon*	'payment'
/u/	[luʂ]	*lux*	'cricket'

(3) Medial glottalized vowel: falling pitch

/a/	[tâ̰ˑl]	*ta'l*	'liquid'
/e/	[tʃḛ̂ˑw]	*che'w*	'cold; star'
/i/	[ḭ̂ˑʃ̺]	*i'sh*	'corn'
/o/	[kχɔ̰̃̂ˑ]	*kjo'n*	'milpa (cornfield)'
/u/	[tˀṵ̂ˑʂ]	*t'u'x*	'wax'

This contrast between flat and falling pitch is obligatory and for Todos Santos speakers despite carrying a very low functional load: as can be seen in the near-minimal pairs above, in no word does pitch/glottalization alone contrast meaning. As such, I do not take the more adventurous stance that glottalized vowels constitute their own class of vocalic phonemes in Todos Santos Mam (see Scott 2023). While this could very well be the case in a further development of the dialect, as it stands now, the system we see today is simply an incipient tonal contrast.

2.3 Stress

Each major geographical dialect area of Mam shows a unique stress assignment pattern (England 2017, p. 501). In Southern Mam varieties, stress is penultimate, whereas in Western Mam varieties, it is penultimate. In Northern Mam, stress is not fixed, but is still predictable, falling on the heaviest rime type available within a word. The Northern Mam weight hierarchy for assigning stress is VV > Vʔ > VC > V (England 1986b, pp. 37-38). The following examples in (4) give an illustration of this hierarchy at play in Todos Santos Mam. Notably, however, if all syllables have equivalent weight, the final syllable is stressed, but stress retracts to penultimate position if a final light syllable would be stressed. A phonological analysis of this pattern is given in Elkins & Kuo (2023).

(4) Todos Santos Mam stress: VV > Vʔ > VC > V

a. *VV outweighs Vʔ*

[kuʔ.ˈwaːl]	*ku'waal*	'child'
[ˈaːl.ʛ̥aʔn]	*aalq'a'n*	'robs'

b. *Vʔ outweighs VC*

[ˈχɪʔ.ʈ͜ʂ'ɐχ]	*ji'tx'aj*	'thin person'
[ʔaχ.ˈɓ̥eʔ]	*ajb'e'*	'wants'

c. *VC outweighs V*

[ma.ˈsat^{h}]	*masat*	'deer'
[ˈʔoχ.ʈ͜ʂɐ]	*ojtxa*	'before'

d. *Default rightmost if non-light syllables are of equal weight*

[ʔaχ.ˈlaŋ]	*ajlan*	'rests'
[tow.ˈsant^{h}]	*towsant*	'todosantero'

e. *Penultimate stress if all syllables are light*

[ˈme.ɓ̥ɐ]	*meb'a*	'orphan, poor one'
[ˈʃ̻ɓ̥ɪ.ʛ̥ɐ]	*shb'iq'a*	'naked'

Stress interacts with the appearance of the two “voice” suffixes: the transitive “directional suffix” *-’n* ‘DS’ and the intransitive “antipassive suffix” *-n* ‘AP’. As noted by England (1983b), if a root contains a heavy nucleus (long vowel or post-glottalized vowel), these suffixes do not appear on the surface, though they are hypothetically still active in the clause. As such, I gloss the suffixes in the examples as containing them regardless of their phonological absence. We can see some examples below in (5a-b). When one of these “heavy roots” takes additional suffixes/enclitics following a voice suffix, the suffix may reappear (6).

(5) Stress conditions surface appearance of voice suffix

a.

ma	tz’-ok	n-che’ya(*-’n)	Juan
PROX	B2/3S-DIR	A1S-**see.DS**	NAME

‘I saw Juan’

b.

lu	qen	n-chin-tz’i’ba(*-n)	poema
DEM	1SG.PRO	INC-A1S-**write.AP**	SP:poem

‘I am writing a poem’

(6) Reappearing voice suffix

n-chin	che’y-**n**=k’a=tz	kub’-na	e-Ø-kub’	n-b’iyo-’n
INC-B1S	see-AP=DIR=DIR	down-ADJ	COM-2/3S/B-DIR	A1S-kill.DS

jel	b’alam
CLF	jaguar

‘I killed the jaguar while looking upside down (at it)’

2.4 Some notable phonological processes

2.4.1 Glottal stop insertion

In Mam, roots which do not begin with an underlying onset consonant are ill-formed and repaired by glottal stop epenthesis. Bennett (2016) comments that onset glottal stop insertion to repair vowel-initial words is a feature common throughout Mayan, whereas other ill-formed structures, such as hiatus, receive varied responses.

(7) Initial [ʔ]-epenthesis in Todos Santos Mam

a.	*iil*	[ʔiːl]	‘problem’
b.	*w-iil*	[w-iːl]	‘my problem’
c.	*aaj Juan*	[ʔaːχ χwan]	‘Juan came (yesterday)’
d.	*ma tz’-aaj Juan*	[ma ts^{ʔ}-aːχ χwan]	‘Juan came (recently)’

Additionally, roots which underlyingly end in a short vowel and no coda consonant must have a glottal coda inserted. This process presumably exists so that subminimal roots could satisfaction a minimal word requirement, however even multi-syllabic words are required to undergo this process. We see that lexical roots ending in an underlying long vowel with no coda consonant are required to insert a glottal stop coda, as shown in (8). Insertion of [ʔ] can be clearly heard by its final aspiration (See Section 2.4.2).

(8) Final [ʔ]-epenthesis in Todos Santos Mam

a.	*ja’*	[χaʔ^{h}]	‘house’
b.	*wo’*	[woʔ^{h}]	‘frog’
c.	*txi’*	[ʈʂ̻ɪʔ^{h}]	‘to go’
d.	*jwe’*	[jweʔ^{h}]	‘five’
e.	*tzalu’*	[tsa.ˈluʔ^{h}]	‘here’

2.4.2 Final aspiration

The plain stops in Mam must be aspirated in final position. The realization of aspiration for the uvular /q/ may be uvular frication: /C^{χ}/. If a word has a final allophonic glottal stop (see Section 2.4.1 just above), the glottal stop is aspirated, indicating that aspiration is fed by glottal stop epenthesis.

(9) Final aspiration in Todos Santos Mam

a.	*taat*	[taːt^{h}]	‘sir, old man’
b.	*snik*	[snɪk^{h}]	‘ant’
c.	*q’a’q*	[ʠ̥a̰ˑq^{h}] ~ [ʠ̥a̰ˑq^{χ}]	‘fire’
d.	*a’*	[ʔaʔ^{h}]	‘water’

Bennett (2016) notes that allophonic final aspiration is another feature which is in evidence across Mayan, and is related to the process of final sonorant devoicing (see also Cavallaro 2021). In Todos Santos Mam, sonorants are not devoiced in word-final position unless they are in clusters containing other voiceless consonants, e.g. *aq'untl* [ʔaˈɠ̥untl̥] 'work'.

2.4.3 Sibilant dissimmilation

Many Mayan languages exhibit restrictions on root-internal sibilants. These can be static co-occurrence restrictions on roots, or active in processes of long-distance sibilant harmony. In Yucatec (Yucatecan), for example, if a root contains two plain sibilants, they must be the same, not disagreeing for [anterior], [constricted glottis], or even [PLACE] (Coon et al. 2016). In Ch'ol, sibilants may co-occur within roots so long as they agree in anteriority (Gallagher & Coon 2009). Mam appears to have weakened this restriction, at least as pertains to static root-internal (non-local) co-occurrence, as we find some roots where two sibilants disagree with respect to the feature [distributed] (10). They do appear to be underrepresented in the lexicon, however.

(10) Todos Santos Mam lacks *[α anterior]...[–α anterior]

a.	*tch'eex*	[tʃ̻'eːʂ]	'loan (*n.*)'
b.	*chyux*	[tʃjuʂ]	'fast, quickly'
c.	*ch'ix*	[tʃ'iʂ]	'prickly'
d.	*xe'chel*	[ˈʂeʔ.tʃel]	'descendant'

There is one corner of the phonological grammar where we do find a sibilant co-occurrence restriction centered around the feature [anterior]. The distal aspect marker *x-* [ʂ-] may not occur in sequence before any of the post-alveolar Set B markers, as that would lead to a local feature clash of *[–anterior][+anterior]. To resolve this illicit structure, the two segments fuse to become a single postalveolar segment of the same manner of articulation. Some examples below illustrate this.

(11) *x + tz' = s'*

nti'=x	**s'**-aj	t-q'ooma=q'a	w-e
	{x-tz'-aj}		
NEG.NP=ENCL	DIST-B2/3S-DIR	A2/3S-say.DS=CLF	A1S-RN:PAT

'He didn't say anything to me'

(12) *x + tz = s*

...kuma	**s-**uul	jun	xjaal	q'olb'ee-l
	{x-tz-uul}			
because	DIST-B2/3S-arrive.here	INDF	man	greet-INF

'...because a man arrived who must be greeted'

(13) *x + ch = xh*

n-Ø-tan=i	taj	**xh**in	poon
		{x-chin}	
INC-B2/3S-sleep=LP	when.nonfut	DIST-B1S	arrive.there

'You were sleeping when I arrived there'

This process is similar to, but distinct from, active processes of sibilant *harmony* attested elsewhere in Mayan. For example, Lyskawa & Ranero (2022) have demonstrated systems of progressive sibilant harmony in Tz'utujil and Sakapultek. Mam lacks this phonological characteristic, keeping this restriction on sibilants specifically local.

3 Words and phrases

3.1 Person and number inflection

Mam is unique among Mayan languages in that it has three loci of person marking: Set A, Set B and the "local person enclitic" glossed 'LP' throughout, pronounced as =*i* (though often reduced in rapid speech to =*a*). Set A is primarily used to mark transitive subjects as well as possessive/genitive arguments; it also inflects relational nouns to introduce peripheral arguments. Set B is used to mark intransitive subjects and transitive objects (that is, to cross-reference absolutive arguments); however, Todos Santos has undergone a change whereby Set B does not faithfully cross-reference the features of transitive objects, relying on the use of independent low pronouns and "default" agreement instead (see §4.1.1). The local person enclitic is used in coordination with both Sets A and B, but crucially only appears on a subset of local persons (speech act participants): all second persons, and the first person plural exclusive.

Table 4 shows Set A inflection (plus the enclitic) and Table 5 shows Set B inflection plus the enclitic.

Table 4: Set A marking (plus enclitic)

	prefix	enclitic
1sg	n- ~ w-	
2sg	t-	=i
3sg	t-	
1pl excl.	q-	=i
1pl incl.	q-	
2pl	ch-	=i
3pl	ch-	

Table 5: Set B marking (plus enclitic)

	prefix /_C	enclitic	prefix /_V	enclitic
1sg	chin		chin	
2sg	Ø	=i	tz'- ~ tz- ~ k'- ~ k-	=i
3sg	Ø		tz'- ~ tz- ~ k'- ~ k-	
1pl excl.	qo	=i	qo	=i
1pl incl.	qo		qo	
2pl	chi	=i	chi	=i
3pl	chi		chi	

Historically, Mam lost its second person prefix and extended third person inflection to both second and third persons (England 1976, 2017). I will follow Scott (2023) in glossing these syncretic morphemes as '2/3', and not specifying the exact person features selected for by context. The person under discussion is clear by virtue of the given prefix in coordination with the enclitic. Although within the prefixes, there is only a two-way person distinction (first-person versus non-first-person), the addition of the enclitics creates a four-way person distinction (first person includive, first person exclusive, second person, and third person).[2]

England (1983b, p. 40) notes that those Set B prefixes which contain vowels are separate words in terms of "juncture." We can interpret this to mean that Set B morphemes constitute independent prosodic words, as opposed to Set A markers, which are all bound morphemes. In Todos Santos, a glottal stop (which independently marks phonological word boundaries) can

[2] Unlike in related Norther varieties like SJA and Ixtahuacán Mam, local person marking in Todos Santos Mam has been lost in the 1st person singular cell; however, certain possessed nouns and RNs, e.g. *w-e='ya*, maintain it.

clearly be heard between Set B markers ending in vowels and following vowel-initial verb roots, indicating prosodic word status.

(14) [qa ʔa.qaˈna.nɐ]

qo	aqana-n=a
A1P	work-AP=LP

‘We (excl.) are working’

There is considerable allomorphy within certain of the cells in the above tables. The 1st person singular Set A marker is realized as *n-* before consonants but *w-* before vowels (15). The 2/3rd person singular Set B marker has the most allomorphs: before consonants it is phonologically null, and before vowels it is *tz'-*. Before the lexical item *uul* ‘to arrive’, however, it is realized as the non-ejective *tz-*. In the potential aspect, this morpheme is realized as velar: before consonants *k-* and before vowels *k'-* (16).

(15) Allomorphs of A1S

a.

ma	∅-txi’	**n-**xo-’n	ta’l	ja’
PROX	B2/3S-DIR	A1S-lose-DS	child	house

‘I lost the key’

b.

ma	∅-**w-**il	Juan	ewa
PROX	B2/3S-see	NAME	yesterday

‘I saw Juan yesterday’

(16) Allomorphs of B2/3S

a.

e-**∅-**jaw	w-ii-n	txi’yaan
COM-B2/3S-DIR	1PS-carry-DS	dog

‘I picked up the dog’

b.

ma	**tz’-**e=x	n-xo-’njun	pluma	
PROX	B2/3S-DIR=DIR	1PS-throw-DS	INDF	SP:pen

‘I threw a pen’

c.

ma	**tz-**ul	t-ii-n	Noé	kob’	pescado
PROX	B2/3S-DIR	A2/3S-bring-DS	NAME	some	SP:fish

‘Noé brought some fish’

d.

Ti’	**k-**xe-l	q-wa-’n?
what	B2/3S-DIR-POT	1P.IN-eat-DS?

‘What should we eat?’

e. **k’-**epa-l jb’aal
B2/3S-fall.rain-POT rain
‘It will rain’

An additional morphophonological process, initially discussed in Section 2.4.3, creates a further alteration of two prefixes which contain sibilants: the B2/3S prefix and the B1S prefix. This process has likely arisen to avoid consecutive sibilants which disagree with respect to retroflection. First, the distal aspect *x-* fuses with a following *tz-* or *tz’-* to create a single segment, either *s-* or *s’-* respectively. An identical process occurs when the distal aspect *x-* immediately precedes the B1S prefix *chin*, yielding *xhin*, or the B2/3P prefixes, yielding *xhi-*.

(17) Distal aspect fusing with B2/3S

a. ...kuma **s-**uul jun xjaal q’olb’ee-l
{x-tz-uul}
because DIST-B2/3S-arrive.here INDF man greet-INF
‘...because a man arrived who must be greeted’

b. Alchee **s’-**aj t-q’o-’n=i?
{x-tz’-aj}
what DIST-B2/3S-DIR A2/3S-give-DS=LP
‘What did you give me?’

(18) Distal aspect fusing with B1S

n-Ø-tan=i taj **xh**in poon
{x-chin}
INC-B2/3S-sleep=LP when.nonfut DIST-B1S arrive.there
‘You were sleeping when I arrived there’

(19) Distal aspect fusing with B2/3S

xhi i’y qa xuuj
{x-chi}
DIST-B2/3S pass.by PL women
‘The women passed by’

3.2 Aspect

Mayan languages are usually described as having aspect, not tense (e.g. Coon et al. 2016, Bohnemeyer 2017). For Mam, England (2007) argues that time information is inferred entirely from aspect and mood. In Todos Santos, the suite of aspect markers has diverged considerably from those described for San Ildefonso Ixtahuacán Mam by England (1983b *et seq*.), and I will therefore in this section not only outline the morphology of aspect marking, but also attempt a brief description of the temporal information conveyed by that marking. First, a summary table of the aspect morphemes and their labels is given below.

Table 6: Aspect marking

aspect	abbreviation	morpheme
completive	COM	o ~ e-
null completive	CØM	Ø
proximate	PROX	ma
distal	DIST	x-
incompletive	INC	n-
potential	POT	(ok)...-l

3.2.1 Completive

There are two ways to form the completive aspect in Todos Santos Mam. The first, which I term simply the "completive", involves the use of a phonologically overt aspect marker and typical agreement marking. The second, the "null completve" (which is not simply phonologically null), requires a somewhat distinct construction.

The completive aspect has two allomorphs, *o* or *e-*. While at this point the generalization is still a bit unclear, *e-* appears to be a more recent innovation having involved the reduction of *o* which has the added effect of making it affixal instead of a freestanding syllable.

(20) Allomorphy between completive allomorphs *o* and *e-*

a. e-Ø-xi' w-oo-n=i q'a
COM-B2/3S-DIR A1S-help-DS=LP CLF
'I helped him'

b. ewa=pa o tz'-aaj Juan?
yesterday=INT COM B2/3S-return Juan
'Did Juan return yesterday?'

The null completive aspect describes roughly the same standard timeframe as the phonologically overt completive, namely events which occurred at some time before today (speakers generally refer to 'yesterday' when describing the time period for both completives). However, at least one speaker reports that the null completive pertains to events which are *slightly further* in the past compared to the phonologically overt completive. Besides this semantic contrast, the two aspects can be distinguished by their differential argument marking structure: while in the overt completive, Set B marking is present and cross-references the subject as would be expected (21a), the null completive may not be used with Set B marking, and the subject must be introduced by an independent subject pronoun, specifically the one used in stative/non-verbal predicate constructions (22b).

(21) Comparison between overt and null completives

a. e-chin uul
COM-B1S arrive.here
'I arrived (here)'

b. Ø-Ø-uul qen
CØM-B1S-arrive.here 1SG.STAT.PRON
'I arrived (here)'

The null completive in Todos Santos is likely part of a restructuring of the dependent-clause aspect markings described by England (1983b) for Ixtahuacán Mam. In Ixtahuacán, certain dependent (subordinate) clauses take allomorphs of the completive and proximate past markers; the dependent allomorph of the completive *o* is Ø. Todos Santos does not have this independent/dependent clause split in terms of aspect marking, and clearly its null completive Ø occurs in matrix clauses (as above). The proximate aspect *ma* in Ixtahuacán has its dependent allomorph in *x-*, which has also been restructured into the distal aspect in Todos Santos (see §3.2.3 below).

3.2.2 Proximate

The proximate aspect in Todos Santos describes events which took place earlier in the same day, right around the utterance time. It may also describe events that have occurred recently (with present relevance), or are about to occur; in this way, because it is not restricted to a specific time frame, it is better described as a proximate aspect rather than a tense or even a "recent past" aspect, the term used by England (1983b).

(22) *ma* describing immediate past events

a.

ma	tz'-ok=x	t-jqo-'n	Juan	t-lameel	ja'
PROX	2/3SB-DIR=DIR	A2/3S-open-DS	NAME	A2/3S-lid	house

'Juan opened the door'

b.

ma	tz'-e=x	n-tchi'ya	j=b'uch
PROX	B2/3S-DIR=DIR	A1S-grind.DS	DEM=nixtamal

'I ground this nixtamal'

(23) *ma* describing immediate future events

a.

ma	tz'-aq'	jb'aal
PROX	B2/3S-start	rain

'It's about to rain'

b.

ma	Ø-txi'	t-waa-'n	xin	xjaal	waab'j
PROX	B2/3S-DIR	A2/3S-eat-DS	CLF	man	tortilla

'The man is about to eat a tortilla'

Past events in the proximate are often translated by native speakers using the perfect in English and Spanish, or with the word 'already' (Sp: *ya*) hinting that, although the actions are completed, they have some present relevance, or at least more than in the completive aspects. Speakers have also used the Spanish term *ahorita* 'right now' to describe the events described by *ma*.

3.2.3 Distal

The distal aspect, realized as the morpheme *x*-, is reserved for events which occur in the same day as utterance time, though earlier than those described by the *ma* aspect, which is more proximate. Speakers often refer to events marked with the distal aspect as occurring "this morning," though it need only be several hours previous to utterance time.

As mentioned above in §2.4.3, there is a morphophonological process whereby *x-*, which is retroflex, fuses with an immediately adjacent retroflex sibilant to its right to create a non-retroflex complex affix.

(24) Examples of the distal aspect

a.

Ti’	x-∅-b’aj	t-e?
what	DIST-B2/3S-happen	A2/3S-RN:PAT

‘What happened?’

b.

chu’w	x-∅-kub’	tz’aq	ne’
hard	DIST-B2/3S-DIR	fall	young.child

‘The child fell down hard’

Like the null completive, the distal aspect in Todos Santos is a restructuring of the historical split aspectual system whereby in certain dependent clauses, the proximate aspect *ma* had the allomorph *x-*; this is still the case in San Ildefonso Ixtahuacán Mam, as described by England (1983b *et seq*.). In Todos Santos, however, *x-* is clearly able to stand in matrix clauses, and has developed a novel temporal specification, regarding events occurring somewhat earlier in the day than utterance time (i.e. less “recent” than the proximate aspect). The Todos Santos pattern, whereby historical dependent aspects have been restructured into dependent aspects with unique aspectual meanings, has also been identified in San Juan Atitán Mam by Scott (2023).

3.2.4 Incompletive

The incompletive aspect marker *n-* is used to describe events which are ongoing, habitual, or durative.

(25) Habitual

n-chi-’x	ta-l	jyaaxh	jaka	kloolj
INC-B1S-go	sleep-INF	early	every	night

‘I go to bed early every night’

(26) Durative

n-qo	awa-n	semilla	ooxa	ora
INC-1P.EX	plant-AP	SP:seed	three	SP:hour

‘We plant seeds for three hours (each day)’

The incompletive marker is also often used in conjunction with the element *lu* to create the present progressive. In this construction, a fronted DP occupies pre-predicative position, modified with the demonstrative *lu*, creating SV(O) order. Without using *lu*, incompletive *n-* may not otherwise be used alone to create a present progressive meaning (27) The past progressive is not made with *lu*, but rather simply with *n-* (28).

(27) Present progressive

a. lu José n-Ø-chiimb'a
LU José INC-B2/3S-play.marimba
'José is playing the marimba'

b. lu xin xjaal n-Ø-b'iyoo-n jel b'alam
LU CLF man INC-B2/3S-kill-AP CLF jaguar
'The man is killing the jaguar'

(28) Past progressive

n-chin ee=x=k'a taj s-uul=i
INC-B1S go.out=go=EMPH when.NONFUT DIST+B2/3S-arrive.here=LP
'I was leaving when you arrived'

3.2.5 Potential

The potential aspect is not regarded as an aspect *per se* by England (1983b) or in any of her following work; however, because many Mayan languages have a potential or prospective aspect, Coon (2016) mentions that what England considers the "potential mood" may be better grouped with the aspects. However, the potential marker is unique among other aspects in that it is primarily marked by means of a suffix *-(V)l* which has a distinct linearization with respect to other verbal material: whereas all other aspect prefixes must immediately precede Set B markers, potential *-l* follows the first directional, or, if there is no directional present, the main verb. In the case of two directionals being present, the potential is linearized after the first one; Scott (2023) suggests that the potential marker is therefore a phonological enclitic. (29) below shows these three situations (directionals boxed).

(29) Potential aspect marking

a. k-b'iitza-**l** xin xjaal nchi'j (no dir.)
B2/3S-sing-POT CLF man tomorrow
'The man will sing tomorrow'

b.	k-w’-**el**	n-tzi’ba	u’jb’il	(1 dir.)
	B2/3S-DIR-POT	A1S-write.DS	book	

‘I will write a book’

c.	Ja	k-w’-**el**=ix	n-tzqij-sa-’n	qa	w-i’j?	(2 dir.)
	where	B2/3S-DIR-POT=DIR	A1S-dry-CAUS-DS	PL	A1S-clothing	

‘Where will I dry my clothes?’

Another distinctive fact about the potential aspect is that it licenses the use of the velar allomorphs of B2/3S, (which we see in 29 above; refer also to §3.1).

The velar allomorphs of B2/3S likely derive from the original morpheme in the true aspect slot: *ok*. In Ixtahuacán Mam, England (1983b, pp. 162-163) shows that dedicated potential aspect marker *ok* is used along with the *-l* suffix (which she explicitly calls a mood marker, not an aspect marker). The aspect marker *ok* is also described for the Cajolá dialect of Mam by Pérez Vail (2014). Todos Santos Mam is undergoing an innovation whereby *ok* no longer used, although one older speaker did use it in at least one sentence I elicited, given below in (30). In the table at the beginning of this section, I have given *ok* within parentheses, as it is so rare and never used among younger speakers.

(30) Use of the *ok* aspect marker in the potential

Alchee	q’iij	**ok**	k-jaw-**il**	n-b’in-cha-’n	ja’	t-e
which	day	**POT**	B2/3S-DIR-**POT**	A1S-make-CAUS-DS	house	A2/3S-RN:PAT

iglesia
church

‘Someday I’ll convert the house into a church’

3.2.6 The =*V’t* perfective

Widely used across Northern Mam is a clitic which is described as “perfective”: in Ixtahuacán, it is =*taq* (England 1983b, pp. 206-207), and in SJA Mam it is =*tq* (Scott, p.c.). This clitic is not an aspect marker *per se*, but is used (often in conjunction with true aspect markers) to indicate that an event within a clause is complete with respect to an event in another clause. The equivalent suffix in Todos Santos is =*V’t*, where the (assumedly historical) uvular in the coda became a glottal and metathesized with the alveolar. The perfective is only used with the proximate aspect and the *o* allomorph of the completive, as it may only select unreduced vocalic hosts.

(31)

oo='t	qo	aaj	qey	taj	x-Ø-jaw	q'oj
COM=PERF	1P.IN	return	1PL.EX.PRON	when.past	DIST-B2/3S-DIR	brawl

'We had already returned when the brawl started'

(32)

oo='t	tz-aq'	fiet	taj	xhi	poon
COM=PERF	B2/3S-start	SP:party	when.past	DIST+B2/3S	arrive.there

w-e='ya
A1S-RN:GEN=LP

'The party had already started when I got there'

(33)

maa='t	n-qo	waa-n=a	q-e=ya	taj
PROX=PERF	INC-1P.B	eat-AP=LP	1P.A-RN:GEN=LP	when.past

s-uul	t-tzik	Juan
DIST+B2/3S-arrive.here	A2/3S-older.brother	Juan

'We were eating when Juan's older brother arrived'[3]

3.3 The noun phrase

This section will briefly discusss the nature of the Todos Santos Mam NP and highlight two areas (possession and the classifier system) that require more detail.

The word classes appearing within the Mam DP include demonstratives, numbers, measure words, the plural marker, possessors, adjectives, and relative clauses. These are ordered in the manner given in (34). There is no definite article in Mam, which was also presumably the case in Proto-Mayan. According to England (1983b, 2017) DPs in Mam are considered definite (or generic) unless they are explicitly marked by the indefinite article *jun* 'INDF', which also functions as the numeral 'one.' There are two slots for demonstratives: there is an initial demonstrative *j*=, indicating a specific entity; other demonstratives follow the noun.

(34) Order of elements within a noun phrase
j= > numeral > plural > classifier > (adj) > **noun** > (adj) > other demonstrative > RC

[3] At this stage, I do not quite understand the co-occurrence of two aspectual markers within the same clause in Todos Santos Mam, with *ma* + *n-* in (33). For SJA Mam, Scott (2023, pp. 62-63) writes that *man* is a complex aspect marker indicating the immediate past, but for Todos Santos the exact semantic contribution of *ma* + *n-* is not fully understood.

(35) Order within the noun phrase

a. *Demonstrative j= > numeral > classifier >* ***noun*** *> other demonstrative*

nuq-sa	n-Ø-ok	n-che'ya	[j=kaab'a	xin	xjaal	lu]
only-EMPH	INC-B2/3S-DIR	A1S-see.DS	DEM=two	CLF	man	this.here

t-u'j	b'e'
A2/3S-RN/on	road

'I only see these two men there on the road'

b. pl > classifier > ***noun***

lu	[qa	jel	ch'it]	n-chi	pur-paj	t-iib'aj	qa	ja'
LU	PL	CLF	bird	INC-B2/3P	fly-IV	A2/3S-RN/on	PL	house

'The birds are flying above the houses'

c. ***noun*** *> RC*

s'-ok	n-che'ya	[xuuj	j=aj	n-Ø-laq'oo-n	muqa]
DIST+B2/3S-DIR	A1S-see.DS	woman	DEM=REL	INC-B2/3S-buy-AP	gourd

'I saw the woman who was buying the gourd'

Whether adjectives precede or follow the nouns they modify appears to vary depending on definiteness: when the DP is definite, adjectives come first (36), but when it is indefinite, they come second (37). Compounds which are formed from an adjective and a noun have the adjective first (38).

(36)

ma	tz'-aj	n-laq'o-'n	jun	chme'y	nim
PROX	B2/3S-DIR	A1S-buy-DS	INDF	turkey	large

'I bought a large turkey'

(37)

e-Ø-xi'	t-k'a-'n	jel	nim	wixh	lech
COM-B2/3S-DIR	A2/3S-drink-DS	CLF	large	cat	SP:milk

'The large cat drank milk'

(38) saq-b'aaq
white-bone
'rope'

3.3.1 Possession

There are two strategies to mark possession in Mam. The first way is to inflect the possessum using a Set A (genitive/possessive) prefix, along with a concommitant local person enclitic, if necesssary. The second, which is arguably more natural or common for Todos Santos speakers, is to mark possession by means of a periphrastic relational noun *e* 'RN:GEN', which itself marks a genetive/possessive relationship. If the latter strategy is used, the LP marker may not occur on the possessum, as the alternation below in (39) demonstrates.

(39) Two strategies for possession

a. t-ja'=y
A2/3S-house=LP
'your house'

b. t-e=y t-ja'
A2/3S-RN:GEN=LP A2/3S-house
your house (same as 39a)'

b.	t-e=y	t-ja'
	A2/3S-RN:GEN=LP	A2/3S-house

The forms of this RN are given below in Table 7. Of note is the marking for the 1st persons, where the enclitic has a (glottalized) vocalic element, appearing as *='ya* instead of as simply *=i/=y*. England (1983b, p. 56) notes variation of this kind for Ixtahuacán Mam as well, and throughout her grammar cites *=(')ya*, *=ky'a*, and even *=k'* as variants of the LP enclitic, just for the 1st person singular . This may indicate that the local person enclitic (for at least some persons) is ultimately derived from a consonantal suffix.

Table 7: Possessive/genitive relational noun e

		sg	pl
1	incl	**w-e='ya**	**q-e='ya**
1	excl		**q-e**
2		**t-e=y**	**ch-e=y**
3		**t-e** CLF	**ch-e** CLF

(40) w-e='ya n-tanma
A1S-RN:GEN=LP A1S-pueblo
'my pueblo'

(41) ch-e q'a ch-pwaq
A3P-RN:GEN CLF A3P-money
'their (masc.) money'

Both possessive strategies may be used to express 'have' with the existential predicate *at* 'EXIST'. Mayan languages notably lack dedicated verbs meaning 'to have.'

(42) Possession with *at* 'EXIST'

a. at t-e=y pwaq
EXIST A2/3S-RN:GEN money
'You have money'

b. at t-pwaq=i
EXIST A2/3S-money=LP
'You have money'

At least in Todos Santos Mam, the usage of these possessive RNs are also used as subject pronouns. We see that, although often unnecessary (since verbal cross-referencing already indicates the subject/agent within the clause), subject pronouns which are identically these possessive RNs are used. Because they are not being used possesssively, I gloss them simply as 'RN.'

(43) n-chin ajla-n w-e'=ya
INC-B1S rest-AP A1S-RN=LP
'I'm resting'

(44) q-e='ya tzalu', at jun q-e='ya nb'aj q-e... (txt)
A1S-RN=LP here EXIST INDF A1S-RN=LP custom A1S-RN:GEN
'We here, we have a custom...'

3.3.2 Classifiers

Like other Mayan languages, Mam utilizes a suite of modifiers which either necessarily precede a set of animate nouns (including names), or may be used anaphorically or as resumptive pronouns. Most, if not all, of these classifiers themselves are derived from nouns, as evidenced by their similarity to the nouns they modify; however, the classifers are phonologically reduced. The list of classifiers is given in Table 6 below.

Table 8: Classifiers

Classifier	Meaning
xin	adult man
xuj	adult woman
q'a	boy, young man
txin	girl, young woman
ne	baby
taat	old man
naa	old woman
jel	animal

(45)	e-Ø-tzaj	chim	xuj	xuu'j
	COM-B2/3S-DIR	faint	CLF	woman

'The woman fainted'

(46)	mii'n	Ø-qxa-n	q'a	ku'waal	piitz
	NEG	B2/3S-play-AP	CLF	child	piitz

'The boy will not play *piitz* (a Mayan sport)'

(47)	Al	s'-ok	che'ya	txin	María
	who	DIST+B2/3S-DIR	see.DS	CLF	NAME

'María saw someone'

(48)	lu	jun	ne	xhlaaq	n-Ø-k'o'-n
	LU	INDF	CLF	baby	INC-B2/3S-crawl-AP

'A baby is crawling around'

Some classifiers, for example *ne*, may be used to modify things that are not canonically a member of that classified set. For *ne*, it serves a diminutive function (49).

(49)	juun	ne	xtx'u'n	t-u'ya=tza	ne	pimient...	(txt)
	some	CLF	mamey.seed	A2/3S-RN:COM=well	CLF	pepper	

'Some little mamey seeds (*semilla de zapote*) with a little pepper...'

Classifiers are *not* required when an animate noun (as a category) is discussed in a general sense, as the following example demonstrates.

(50)

a’ysa	t-tchi’	t-i’j	(*ne)	xhlaaq
very	A2/3S-fear	A2/3S-RN:OBL	CLF	baby

‘I’m afraid of babies’

The animal classifier *jel* may combine with the indefinite article *jun* to create one phonological word *jun=l*, as the following example demonstrates. This is the only classifier that shows this behavior.

(51)

mii’n	s’-etz	t-laq’o-’n	Pedro	jun=l	tcheej
NEG	DIST+B2/3S-DIR	A2/3S-buy-DS	NAME	INDF=CLF	horse

‘Pedro didn’t buy a horse’

Additionally, some speakers phonologically reduce the nasal-final classifiers *txin* and *xin* so much that they become phonological enclitics on the proceeding phonological word: *=txa* and *=xa*, respectively.

(52) Phonological enclitic classifiers

a.

x-t-il**=txa**	jun=l	pu’t	(> *txin*)
DIST-A2/3S-see=CLF	INDF=CLF	butterfly	

‘She saw a butterfly’

b.

at=pa**=xa**	Harold	t-ja’=xa?	(> *xin*)
EXIST=INT=CLF	Harold	A2/3S-house=CLF	

‘Is Harold at his house?’

3.4 Verbs

3.4.1 Directionals

Mam is unique among Mayan languages for its large suite of directional verbal auxiliary particles (“directionals”) which modify the verbal event. Each directional is ultimately derived from an intransitive verb of motion which means what the directional now roughly contributes to the event semantics. Each motion verb still also exist independently in the synchronic language.

There are 12 "simplex" directionals, which may be additionally compounded (phonologically and semantically) to form additional "complex" directionals. The simplex directionals are given in Table 9 below, along with the motion verbs from which they are derived.

Table 9: Simplex directionals

	Directional	Meaning	Motion verb etymon
DEIX	xi' ~ txi'	go, away from speaker	xi' ~ txi' 'go'
	tzaj	come, toward speaker	tzaaj 'come'
	ul	arrive here	uul 'arrive here'
	pon	arrive there	poon 'arrive there'
GRND	jaw	up; to the north	jaaw 'go up; to go north'
	kub'	down; to the south	kub' 'go down; to go south'
	el	out; to the west	eel 'go out; to go west'
	ok	in; to the east	ook 'go in; to go east'
	chaj	remaining	chaaj 'remain'
	aj	return	aaj 'return'
	i'y	passing by	i'y 'pass by'
B'AJ	b'aj	complete	b'aj 'complete, happen; die'

In the table, I divide the 12 directionals into three groups: *deictic*-oriented directionals, *ground*-oriented directionals, and *b'aj*, which seems to be neither deictic- nor ground-oriented. Deictic-oriented directionals are fundamentally egocentric: they describe the motion of the clausal verb with respect to the speaker (e.g. *tzaj* 'toward the speaker'). Ground-oriented directionals are not egocentric, but describe movement of the subject through non-egocentric space (e.g. *el* 'to the west'). The directional *b'aj*, while distributionally similar to all the other 11 directionals, doe not describe a direction *per se*, but instead denotes that the action as completed.

When directionals are combined, this grouping also comes into effect: ground-oriented directionals always precede deictic-oriented directionals if the two occur together as a compound directional in Mam (first noted by Zavala 1993).

(53)	e-Ø-ku'=x	t-awa-'n	t-e=y	semilla	(*kub' + xi' = ku'x*)
	com-b2/3s-dir=dir	a2/3s-plant-ds	a2/3s-rn=lp	seeds	
	'You planted seeds'				

There are also complex directionals built from a ground-oriented directional, a deictic-orianeted directional, *and* the directional *b'aj*, although these are rare in unelicited speech. As shown in (54) below, the order is ground-oriented > deictic-oriented > *b'aj*.

(54) ma Ø-ku'=x=b'aj aw-eet kjo'n w-u'n
PROX B2/3S-DIR=DIR=DIR plant-PASS corn A1S-RN:PAT
'I finished planting the corn'

Directionals are almost universally required in transitive clauses; essentially every transitive verb obligatorily takes a directional, with a small handfull of exceptions to be discussed below. Intransitive verbs, on the other hand, almost universally do not take directionals; however, intransitives may also co-occur with them for some items. In the following examples are clauses with a transitive verb plus a directional (55a), a transitive verb without a directional (55b), an intransitive verb without a directional (55c), and an intransitive verb with a directional (55d). As all example sentences illustrate, directionals immediately follow Set B marking.

(55) Verbs with and without directionals

a. e-tz'-ok t-q'aana q'aanil naya (transitive w/ dir.)
COM-B2/3S-DIR A2/3S-cure.DS doctor 1SG.PRO
'The doctor cured me'

b. e-Ø-t-il t-anb'a Juan ja=y (transitive w/o dir.)
COM-B2/3S-A2/3S-see A2/3S-sister Juan 2SG.PRO
'Juan's sister saw you'

c. ma Ø-chim xuj xuuj (intransitive w/o dir.)
PROX B2/3S-die CLF woman
'The woman died'

d. e-chin jaw tz'aq (intransitive w/ dir.)
COM-B1S DIR fall
'I slipped'

The 'motion away' directional is realized with its fricative-intial allomorph *xi'* only before the null completive, and as its affricate-initial allomorph *txi'* elsewhere.

(56) Allomorphy of *txi'* ~ *xi'* 'go'

a.

Alchee	ma	Ø-txi'	t-q'o-'n	María	t-e	José?
what	PROX	B2/3S-DIR	A2/3S-give-DS	NAME	A2/3S-RN:PAT	NAME

'What did María give to José (earlier today)?'

b.

Alchee	Ø-Ø-xi'	t-q'o-'n	María	t-e	José?
what	CØM-B2/3S-DIR	A2/3S-give-DS	NAME	A2/3S-RN:PAT	José

'What did María give to José (yesterday)?'

A directional+verb sequence is not like to a serial verb construction; the entire sentence describes a single verbal event. A verb may appear with a variety of directionals depending on context, in which case the directional used effects the verbal semantics. This may accord with a subtle semantic difference or a complete change of translation of the verb in English. For example, when the (irregular) verb *q'iil* 'to take, carry, bear' co-occurs with the directional *jaw* 'up' it renders the meaning 'pick up', whereas when it occurs with the directional *ul* 'arrive here', it renders the meaning 'bring'.

(57) Same verb root, different directional

a.

e-Ø-jaw	w-ii-n	qa	ne'	xhlaaq
COM-B2/3S-DIR	A1S-carry-DS	PL	CLF	bab

'I picked up the babies (with my hands)'

b.

ma	tz-ul	t-ii-n	Noé	kob'	pescado
PROX	B2/3S-DIR	A2/3S-bring-DS	Noah	some	SP:fis

'Noé brought some fish'

As mentioned above, directionals may combine phonologically and semantically with each other to form "complex" directionals. In such cases, both directionals still occupy their position following Set B and preceeding the main verb. Certain directionals, such as *xi'* 'go' and *tzaj* 'come' very commonly combine with other directionals, whereas others are less commonly combined. Table 10 below showcases how certain directionals combine with others.

Table 10: Some complex directionals

DIR1		DIR2		Result	Meaning
jaw	+	xi'	=	jax	going up
kub'	+	xi'	=	ku'x	going down
el	+	xi'	=	ex	going out
ok	+	xi'	=	okx	going in

jaw	+	tzaj	=	jatz	coming up
kub’	+	tzaj	=	ku’tz	coming down
el	+	tzaj	=	etz	coming out
ok	+	tzaj	=	oktz	coming in

As discussed above in §3.2.5, a second directional in a complex directional is ordered after the potential suffix *-l* in the potential aspect. As the potential suffix is already variable in its linearization (it may occur after a directional, between directionals, or after the main verb, depending on the clause), this is an indication that it and directional morphemes may be enclitics.

(58) Position of directionals w.r.t. the potential aspect morpheme

a. k-b’iitza**-l** xin xjaal nchi’j (no directional)
B2/3S-sing-POT CLF man tomorro
‘The man will sing tomorrow’

b. k-w’**-el** n-tzi’ba u’jb’il (1 directional)
B2/3S-DIR-POT A1S-write book
‘I will write a book’

c. Ja k-w’**-el**=ix n-tzqi’j-sa-’n qa w-i’j? (2 directionals)
Where B2/3S-DIR-POT=DIR A1S-dry-CAUS-DS PL A1S-clothing
‘Where will I dry my clothes?’

As discussed by England (1983b), the two directionals *xi’* and *tzaj* may additionally attach to intransitive verbs of motion; these are the only directionals that may do so. Such combinations are not considered complex directionals, since the motion verb is not itself a directional auxiliary, but a full main verb in and of itself.

(59) Directional attaching to a main intransitive motion verb

a. e-Ø-jaa=x xin xjaal t-iib’aj jel tcheej (*xi’*)
COM-B2/3S-go.up=DIR CLF man A2/3S-RN:on CLF horse
‘The man rode (lit. went up on) the horse’

b. ma chin-ook=tz tu’wna (*tzaj*)
PROX B1S-go.in=DIR inside
‘I went inside’

The fact that this behavior is limited to the directionals *xi'* and *tzaj*, which mean 'go' and 'come', respectively, reflects the behavior of other analogous directional structures in related and neighboring languages. For example, in Kaqchikel, a related K'ichean-Mamean Mayan language, there are two so-called "movement morphemes", *b'e-* 'go' and *o-* 'come' which may modify a verbal event in a similar way to Mam directionals. In Zapotecan, a language family which shares many aereal similarities with Mayan, two "directional prefixes" expressing the same concepts are used; below, the example is from Tlacolula Valley Zapotec.

(60) 'Go' and 'come' modifiers in related/nearby languages

a. y-in-**o-**a-q'et-ej (Kaqchikel)
PRS-1SG:ABS-come-2SG:ERG-hug-TV
'You come hug me' (Heaton 2016, p. 320)

b. r-**gu-**èi'ny=ih (Tlacolula Valley Zapotec)
HAB-DIR(go)-do=3S
'He goes and does (it)' (Chávez-Peón & Mudzingwa 2008, p. 11)

As mentioned above, many of the directionals have a phonologically reduced form that is used when they occur as enclitics, e.g. *xi'* becomes *=x*. Table 11 gives an (inexhaustive) list of the forms of directionals when they occur in this position (*=wa* is homophonous for *jaw* and *b'aj*).

(61) Post-verbal directional allomorphs (e.g. *jaw* ~ *=wa*)

a. ma chin jaw si'ypaj
PROX B1S DIR scared
'I was scared'

b. Ø-Ø-siy'pu-n**=wa** q'a!
B2/3S-A2/3S-scare-IMP=DIR CLF
'Scare him!'

Table 11: Word-final, phonologically reduced allomorphs of some directionals

DIR	=DIR	Meaning
xi'	=x	motion away
tzaj	=tz	motion towards
ok	=k	motion in
el	=l	motion out
kub'	=k'a	motion down

jaw	=wa	motion up
b’aj	=wa	complete

As a final note, directionals are sensitive to transitivity and often disappear if the valence of the clause is reduced. We see this most clearly in passives and antipassives. To give one example, in a transitive clause, a directional is required (59a), however if it is converted into an passive, the directional disappears (59b).

(62) Directional disappears in passive: exemplar sentence

a.

Ø-Ø-**ok**	t-b’in-cha-’n	María	is
CØM-B2/3SS-DIR	A2/3S-do-CAUS-DS	NAME	potato

‘María cooked the potato’

b.

e-Ø-b’in-t	is	t-u’n	María
COM-B2/3S-do-PASS	potato	A2/3S-RN:AGT	NAME

‘The potato was cooked by María’

In another common alternation, we see that transitive sentences whose thematic subjects are fronted in a *lu*-progressive, lose their directional in the resultant antipassive.

(63) Directional disappears in *lu*-progressive antipassive

a.

ma	tz’-**ok**	t-pju-’n	Miguel	xin	xjaal
PROX	A2/3S-DIR	A2/3S-hit-DS	NAME	CLF	man

‘Miguel hit the man (earlier)’

b.

lu	Miguel	n-Ø-pjuu-n	t-e	xin	xjaal
DEM	Miguel	INC-B2/3S-hit-DS	A2/3S-RN:PAT	CLF	man

‘Miguel is hitting the man (right now)’

This evidence is reason to believe that directionals, as well as adding directional/aspectual information to the clause, also have a syntactic function: namely, introducing the external argument. This also goes to explain why virtually all transitive verbs must co-occur with directionals, whereas very few intransitive verbs do.

There are a small number of transitive verbs that do not take directionals, but they all have very unusual morphosyntactic behavior. These verbs are *il* ‘see’, *aj* ‘want’, *acha* ‘like’, *tchi’* ‘not want’ and *tzqi’n* ‘to know’. While I do not elaborate here for reasons of space, there is evidence to believe these are in fact formally nominalizations, not verbs.

3.4.3 Imperatives

The imperative in Mam can be formed from either transitive or intransitive roots, however transitive imperatives require the use of a dedicated suffix: *-n* ~ *-m*. The alveolar allomorph is used before consonant-initial directionals and the bilabial allomorph is used before directionals with epenthetic vowels, as the examples in (64) illustrate. This pattern is somewhat familiar given the pattern England (1983, p. 173) describes for Ixtahuacán Mam, where the "elsewhere" imperative morpheme is *-m*, but appears as *-n* before directionals.

Also of importance, which can also be seen in (64), is that in imperative contexts, directionals appear post-verbally, whereas in non-imperative contexts, they are always pre-verbal.

(64) Transitive imperative allomorphy

a. Ø-Ø-waa-**n**=x waab'j!
B2/3S-A2/3P-eat-IMP-DIR tortilla
'Eat the tortilla!'

b. Ø-ch-pjuu-**m**=itz=i!
B2/3S-A2/3P-push-IMP=DIR=LP
'Push (it), y'all!

The person-marking pattern in imperatives somewhat differs from that in non-imperative contexts. A plural transitive imperative is marked with the A2/3P marker *ch-*, however the singular transitive imperative is not marked with the typical A2/3P marker *t-*, but rather, the person marking is null. This null marking is also reported for Ixtahuacán Mam (England 1983b, pp. 173-174).

Intransitive imperatives do not take the dedicated imperative marker, as seen with the intransitive verb *majee* 'to marry (with)' (65).

(65) Intransitive imperative

a. e-Ø-ja=x tutz'-ee' qen chix
COM-B2/3S-DIR=DIR sitting-IV 1SG.PRON there
'I sat down there'

b. Tutz'-ee'=wa=x!
sitting-IV=DIR=DIR
'Sit down!'

Lastly here, we may discusss the negative imperative. This form does not follow the typical imperative structure seen in positive imperatives. Following the standard clausal negator *mii'n* 'NEG', all the rest of the marking within the clause is just as it would be in a non-imperative clause, with the exception that there is no aspect marker. The imperative suffix *-n ~ -m* is not used, and imperatives surface in their expected pre-verbal position. Mam, therefore, lacks a "true" negative imperative construction (see Han 2000, also Zeijlstra 2006 for an overview).

(66) mii'n tz'-ok t-tzuyu-'n=i txi'yaan!
NEG B2/3S-DIR A2/3S-touch=LP dog
'Don't touch the dog!'

(67) Noé, mii'n tz'-ok=tz t-jqo-'n t-e=y ja' n-witz
Noah, NEG B2/3S-DIR=DIR A2/3S-open-DS A2/3S-RN=LP house A1S-face
'Noah, don't open my door!'

3.5 Non-verbal predicates

Many Mayan languages have non-verbal predicates (NVPs), which are predicates which have a base in a noun (68a), adjective (68b), positional (68c; see §3.6 below), demonstrative (68d), positive existential *at* (68e), or negative existential (68f). Sentences which include nonverbal predicates do not describe events, but rather states, and have also been called "statives" in the literature.

(68) Nonverbal predicates in Todos Santos Mam

a. alaq' qen
thief 1SG.PRON
'I am a thief'

b. siktnin qo'
tired 1PLIN.PRON
'We (incl.) are tired'

c. looq qen
wet.POS 1SG.PRON.NVP
'I am wet'

d. txi’yaan jel lu
dog CLF DEM
‘This is a dog’

e.	at	nim	muuj	t-witz	cha’j
	EXIST	many	cloud	A2/3S-RN/front	sky

‘There are many clouds in the sky

f.	nti’=x	jos	t-u’j	ja’
	NEG.EXIST=ENCL	egg	A2/3S-RN:in	house

‘There isn’t an egg in the house’

How person marking is achieved in nonverbal predicates is somewhat debated, and may differ across Mam dialects. For Ixtahuacán Mam, England (2017, p. 512) describes the inflection as essentially Set B morphology with some “modifications” (assumed to refer to phonological changes). For SJA Mam, Scott (2023) argues that an analysis relying on Set B doesn’t accurately reflect the picture given by England, and describes the paradigm instead as involving pronouns, plus the local person enclitic if applicable. This change would be an innovation in SJA Mam. In Todos Santos, the appropriate forms, given below in Table 10, appear to pattern similarly to those in SJA Mam, and it does appear that these forms are used as pronouns. Table 12 below specifically shows the forms as they would follow nonverbal predicates, with the NVP *at* ‘EXIST.’ The second person singular is realized here simply as the local person enclitic, as it is assumed to be phonologically weak to surface on its own.

Table 12: Person marking in non-verbal predicates

		sg	pl
1	excl	at **qen**	at **qo’=y**
1	incl		at **qo’**
2		at=**i**	at **qi=y**
3		at CLF	at qa

(69) siktnin qen
tired 1SG.PRO.NVP
‘I’m tired’

(70) tzkaj=i!
fool=LP
‘You’re a fool!’

(71) txi'yan jel
dog CLF
'They are dogs'

(72) towsant qo'
Todosantero 1P.IN.PRO
'We (incl.) are Todosanteros'

3.6 Positionals

Positionals are a unique root class in Mayan, being neither adjectival nor verbal. They overwhelmingly confirm to a /CVC/ root shape phonological template (Bennett 2016). They refer to "physical states, configuration, shape, or surface quality" (Coon 2016) and may not enter into further derivation without being explicitly verbalized or adjectivalized, typically by means of positional-specific morphology.

In Mam, verbs and adjectives are derived from positional roots with one of two lexically-specific suffixes, *-l* (73) or *-ch* (74). An additional suffix, describing "be or be placed in the position, form, or state described by the root" (England 1983b, p. 80), is *-ee'* (75). Positional-derived verbs also have a unique causativizer, *-bV*, where "*V*" here is a non-harmonic vowel.

(73) lu jun ch'it n-Ø-wa'-**l**=k'a t-iib'aj t-wi' q'a
DEM INDF bird INC-B2/3S-stand-POS=DIR A2/3S-RN/on A2/3S-head CLF
'There is a bird standing on his head'

(74) Ø-Ø-tu-**l**-b'aa-n=k'a!
B2/3S-A2/3S-round-POS-CAUS-IMP=DIR
'Make it round!

(75) e-Ø-ja=x tutz'-ee' qen chix
com-b2/3s-dir=dir sitting-iv 1sg.pron there
'I sat down there'

3.7 Relational nouns

Mam, like other Mayan languages, has a class of so-called “relational nouns”, a term used in Mayan linguistics to refer to certain elements which introduce peripheral/oblique arguments. In this way, they function essentially as prepositions; Larsen (1988, p. 127) writes “like prepositions...they are placed before an ‘object’ noun phrase to indicate the case of that noun phrase, but unlike prepositions they are formally possessed nouns with the following object noun phrase being formally the possessor of the relational noun.” The term “relational noun” is therefore a nod to these elements’ nature as formally nominal, although the term is somewhat opaque because they function prepositionally. Indeed, Munro (2012), writing of the Mayan language Q’anjob’al, has demonstrated convincingly that relational nouns have the distribution and function of prepositions, and in fact, theoretical work since at least Henderson (2012) has situated them as the heads of PP’s (though many interchange PP with the functionally equivalent “RNP”). (For more on relational nouns in the nearby Zapotec language Tlacolula Valley Zapotec, see Lillehaugen & Munro 2006). In at least one Mayan language, Uspantek, Bennet & Henderson (2013) show that RNs are more phonologically reduced than “true” nominals, hinting at their more functional nature.

In any case, the structure of an RNP is, at least on the surface, identical to that of a possessed noun phrase in Mam, as noted by Larsen. England (2017, p. 514) showss this vissually in the following table, reproduced here as Table 10, with adjustments to make the table suit Todos Santos Mam.

Table 13: Comparable structures of possessed NPs and RNPs (England 2017, p. 514)

Possessed noun phrase		Relational noun phrase	
t-ja’	xuuj	t-u’j	ja’
A2/3S-house	woman	A2/3S-RN:in	house
Set A-possessed N	possessor	Set A-relational N	complement
‘the woman’s house’		‘in the house’	

As shown above, RNs are always possessed, marked with Set A. This Set A marker cross-references the features of the peripheral argument which is the complement of the given RN. Some examples of this follow.

(76)	lu	jel	txi'yaan	n-Ø-tan	**t-**jaq'	mes
	LU	CLF	dog	INC-B2/3S-sleep	B2/3S-RN/below	SP:table

‘The dog is sleeping under the table’

(77)	e-Ø-xi'	n-q'o-'n	tumil	**ch-**e	xjaal	t-iib'aj	iil
	COM-B2/3S-DIR	A1S-give-DS	idea	A2/3P-RN:PAT	man	2/3.A-RN/on	problem

‘I gave the people information about the problem’

(78)	s'-ab'i-n	Juan	**w-**i'j
	DIST+B2/3S-listen-AP	NAME	A1S-RN:OBL

‘Juan listened to me’

RNs can be broken down into to groups: those that function as locatives and those that serve other grammatical functions (what England 1983b, p. 72 refers to as “case”). The nouns from which many RNs are derived refer to parts of the body or common objects but as RNs refer to abstract locative relations. For just two examples, *t-wi'* ‘above’ derives from the noun *wii-b'aj* ‘head’, and *t-tzii* ‘at the entrance of’ derives from the noun *tzii-b'aj* ‘mouth.’ Table 12 below lists the RNs used in Todos Santos, given in their A2/3S form, along with the noun from which they were most likely derived (* = not used in Todos Santos but mentioned as source in England 1983b, pp. 71-72). Some examples of locative RNs used in sentences are given afterwards.

Table 14: Relational nouns in Todos Santos Mam

Locative RN	meaning	nominal etymon
t-witz	in front of	witz-b'aj 'face'
t-xeel	instead of	*xeel-b'aj 'replacement'
t-xool	between	*xool-b'aj 'interval'
t-miij	in the middle of	
t-txlaaj	beside	
t-iib'aj	over, on (top of)	
t-jaq'	below, under	jaq'-b'aj 'cushion'
t-xe	at the base of	*t-xee' 'its root'
t-u'j	in, during	k'u'j-b'aj 'its stomach'
t-wi'	above	wii-b'aj 'head'
t-txa'n	at the edge of	txam-b'aj 'nose'
t-xu'k	at the corner of	
t-tzii	at the entrance of	tzii-b'aj 'mouth'
Grammatical RN	**meaning**	
t-i'j	patient, theme (oblique)	
t-i'	complementizer; from	
t-u'ya	instrument, comitative, DP coordinator	
t-e	genitive, dative, benefactive, patient	
t-iib'	reflexive, reciprocal	
t-witz	comparative, benefactive; on the surface of	
t-u'n	agent, causative, instrumental, purpose clause, reason clause; from	

(79) lu jun xjaal n-wa'-l=k'a t-tx'a'n ja'
DEM INDF man INC-stand-POS=DIR A2/3S-RN/corner house
'A man is leaning against the corner of the house'

(80) ja jel ko' x-Ø-kub' n-b'iyo-'n t-xeel jel e'y
DEM CLF rooster DIST-B2/3S-DIR A1S-kill-DS A2/3S-RN/instead.of CLF hen
'It was the rooster I killed instead of the hen'

(81) e-Ø-ku'=x eewa jun sqit t-u'j jul
COM-B2/3S-DIR=DIR hide INDF fox A2/3S-RN/in hole
'A fox hid in a hole'

(82) at nim muuj t-witz cha'j
EXIST many cloud A2/3S-RN/front sky
'There are many clouds in the sky'

4 Simple clause structure

4.1 Arguments and alignment

4.1.1 The Mayan absolutive parameter

Mayan languages are often divided into two categories based on the relative linear position of its Set B (absolutive) agreement morpheme (Bricker 1977, Coon et al. 2014, Assmann et al. 2015, Coon et al. 2021). In so-called "high-absolutive" languages, the absolutive marking precedes the verb stem, whereas in "low-absolutive" languages, the absolutive marking follows the verb stem. Across Mayan, other morpheme slots shared across the family, such as aspect/mood, status, etc., appear in roughly the same order; languages tend to differ in just this parameter.

(83) The Mayan absolutive parameter (Coon et al. 2014, p. 190)

HIGH-ABS	ASPECT	**ABS**	ERG	ROOT	(DERIV.)	SUFFIX	
LOW-ABS	ASPECT		ERG	ROOT	(DERIV.)	SUFFIX	**ABS**

This division into high- and low-abs is not simply descriptive; each parameter setting has long been understood to be associated with a collection of morphosyntactic properties. Tada (1993) notes a correlation within the family between a language's absolutive parameter setting and the presence of syntactic ergativity. This generalization has since come to be known in the literature as "Tada's Generalization," summarized in (84).

(84) Tada's Generalization (Tada 1993, p. 106)

High-abs Mayan languages overwhelmingly restrict the extraction of ergative subjects. All low-abs Mayan languages have no restrictions on ergative extraction.

The locus of Mam's Set B marking is clearly preverbal, and Mam does have a ban on ergative extraction, situating it, at least by these measures, as a high-abs language. Varieties of Mam such as Ixtahuacán, described in detail by Nora England, do not challenge this description. Below, we see an example from Ixtahuacán showing the "expected" case: absolutive arguments (intransitive subjects and transitive objects), are marked with the appropriate Set B morpheme that expresses the absolutive argument's person and number features.

(85) Ixtahuacán Mam (England 1983b)

a.

o	**chin**	poon=a
COM	B1S	arrive.there=LP

'I arrived there'

b.

ma	**chin**	ok	**t**-tzeeq'a-n=a
PROX	B1S	DIR	A2/3S-hit-DS=LP

'You hit me'

In Todos Santos Mam, the use of Set B morphology is somewhat different. Todos Santos Mam presents what has been referred to by Scott & Sales (2021) and Scott (2023) as "Default Set B." Default Set B is also observed in nearby SJA Mam. The structure of Default Set B proceeds as follows. First, intransitive subjects are cross-referenced with the expected Set B morpheme which tracks its person and number features (86). However, the Set B morpheme used to mark transitive objects does not faithfully expone the person and number features of the object; instead, a "default" Set B morpheme is used. In Todos Santos and SJA Mam, that default morpheme is the 2/3rd person singular Set B morpheme. The features of the transitive object are instead realized as a low pronoun in object position. This state of affairs is given in example (87), where the object pronoun expressing 1st person singular features is *na'ya*. For simplicity, I refer to the usage of Set B by more conservative varieties of Mam like Ixtahuacán – exemplified in (85) – as "Expected Set B," to contrast with Todos Santos Mam's "Default Set B."

(86) Intransitive Set B: expresses appropriate features (Todos Santos Mam)

ma	**chin**	ajla-n	ch'in
PROX	B1S	rest-AP	some

'I rested a bit'

(87) Transitive Set B: does not express appropriate features but is default (Todos Santos Mam)

ma	**tz'**-ok	t-pjuu-'n	Miguel	**na'ya**
PROX	B2/3S-DIR	A2/3S-hit-DS	Miguel	1SG.PRON

'Miguel hit me'

The filled but default Set B slot holds for the entire paradigm, as the examples below demonstrate. Each transitive object is expressed with a dedicated object pronoun rather than a Set B marker which cross-references the object's person features within the verbal complex.

(88) Default Set B paradigm

Miguel hit...

me	ma **tz'-**ok t-pju-'n Miguel **na'ya**
you (sg.)	ma **tz'-**ok t-pju-'n Miguel **jay**
him	ma **tz'-**ok t-pju-'n Miguel **ja CLF**
we (excl.)	ma **tz'-**ok t-pju-'n Miguel **jo'ya**
we (incl.)	ma **tz'-**ok t-pju-'n Miguel **jo'**
you (pl.)	ma **tz'-**ok t-pju-'n Miguel **jey**
them	ma **tz'-**ok t-pju-'n Miguel **je CLF**

Speakers of Todos Santos Mam, while offering a Default Set B configuration, nonetheless do accept an Expected Set B configuration, whereby the transitive object's person and number features are faithfully cross-referenced by appropriate Set B marker, with no low pronoun. This setup is the only configuration possible in Ixtahuacán Mam, another Northern dialect (England 1983b *et seq.*) and Cajolá Mam, a Southern dialect (Pérez Vail 2014). Todos Santos speakers judge the Expected Set B configuration (89b) to be much more formal, or "correct" from a strictly prescriptive point of view, often commenting that this is how older people speak or used to speak. These comments and judgements indicate that Defaul Set B (89a) is a very recent innovation, perhaps having taken place across the last one or two generations. Further evidence for the relative recency of the innovation comes from the fact that Default Set B is not described in the grammar sketch of Todos Santos by Canger (1969), which it certainly would have been had it been present in the language at the time.

(89) Default Set B ~ High Set B alternation

a. ma	**tz'-**ok	t-pjuu-'n	Miguel	**na'ya**		(Default Set B)
PROX	B2/3S-DIR	A2/3S-hit-DS	NAME	1SG.PRON		

'Miguel hit me'

b. ma	**chin**	ok	t-pjuu-'n	Miguel	(Expected Set B)
PROX	B1S	DIR	A2/3S-hit-DS	Miguel	

'Miguel hit me'

Additionally, it appears that the independent low pronouns are combinations of the demonstrative *j=* ‘DEM’ and a vocalic pronominal element. As a comparison, see the forms used for nonverbal predication and for transitive objects, given in Table 15 below.

Table 15: Non-verbal predicate pronouns *vs.* transitive object pronouns

a. NVP pronouns

		sg	pl
1	excl	**qen**	**qo=’y**
1	incl		**qo’**
2		**=i**	**qi=y**
3		CLF	qa

b. TO pronouns

		sg	pl
1	excl	**na’ya**	**jo’=y(a)**
1	incl		**jo’**
2		**ja=y**	**je=y**
3		**ja** CLF	**je** CLF

(90) Vocalic elements for TO pronouns

=o’ 1st persons (excluding *na’ya*)
=a 2/3 persons singular
=e 2/3 persons plural

A point regarding the first person pronouns: the TO pronoun is *na’ya*, which does not at first appear to be a phonological combination of *ja* ‘DEM’ plus *qen*, the NVP subject pronoun, or any other of the morphemes that realize first person features elsewhere in the language. However, since this word does not co-occur with a portion resembling *j=*, we can assume that it is suppletive.

4.1.2 Person hierarchy constraints

In Todos Santos, the local person enclitic *=i* can be used to cross-reference either the transitive subject or object (this is “omnivorous agreement” in the terminology of Nevins 2011 or “promiscuous agreement” in the terminology of Béjar 2003), as the examples in (91a,b) demonstrate. However, if there is ambiguity (i.e. no overt DP subject or object is present), *=i* is interpreted as referencing the subject (92).

(91) Local person enclitic cross-referencing either subject or object

a.

ma	tz'-ok	t-pju-'n=i	j=a	q'a	(subject)
PROX	B2/3S-DIR	A2/3S-hit-DS=LP	DEM=2/3S.PRON	CLF	

'I hit him'

b.

ma	tz'-ok	n-pju-'n=i	(object)
PROX	B2/3S-DIR	A1S-hit-DS=LP	

'I hit you'

(92) Subject over object interpretation in the local person enclitic

ma	tz'-ok	t-pju-'n=i
PROX	B2/3S-DIR	A2/3S-hit-DS=LP

'You hit it'
Cannot mean: *'It hit you'

In Ixtahuacán Mam, England (1983b, p. 62) demonstrates that clauses in which the subject would not be expected to take the local person enclitic but the object would are ungrammatical. This feature of Ixtahuacán is likely related to the fact that in Todos Santos, the LP enclitic receives a default subject interpretation in cases of ambiguity.

(93) San Ildefonso Ixtahuacán Mam (England 1983b, p. 62; glosses adapted)

a.

ma	chin	ok	t-tzeeq'an=a
PROX	B1S	DIR	B2/3S-hit=LP

'You hit me'
Cannot mean: *'He hit me'

b.

?Ma	chin	ok	t-tzeeq'an=a
PROX	B1S	DIR	B2/3S-hit=LP

Intended meaning: 'He hit me'

This may ultimately be related to a broader feature of person hierarchy constraints in Mam: in many varieties, including Ixtahuacán (Northern) and Cajolá (Southern), there exists a constraint whereby the object must not outrank the subject on a person or animacy hierarchy. More concretely, it is impossible for a non-local subject to act on a local person object. Pérez Vail (2014) describes that for Cajolá Mam, the method for side-stepping this constraint is to use a passive or antipassive construction in which the object is introduced as an oblique argument introduced by a relational noun (essentially a *by*-phrase).

(94) Cajolá Mam (Pérez Vail 2014, p. 257; glosses adapted)

a. ma Ø=kub' tzyu-'n=a k-u'n
PROX B2/3S=DIR grab=LP A2/3S-RN:AGT
'You were grabbed by them'

b. *ma Ø=kub' k-tzyu-'n=a
PROX B2/3S=DIR A2/3P-grab=LP
'Intended meaning: 'They grabbed you'

Such person hierarchy constraints are not attested in Todos Santos Mam, as it is not the case that personal transitive objects are expressed as Set B, but rather as low pronouns. Following the syntactic analysis in Scott (2020b), we can ssay that because the object is realized as a pronoun, there is not an agreement problem between the subject and object (see also Yuan 2023). The same is true of SJA Mam (95b), the other attested Default Set B variety.

(95) Non-local acting on local in Todos Santos and SJA Mam

a. ma tz'-ok t-pju-'n Juan na'ya (Todos Santos)
PROX B2/3S-DIR A2/3S-hit-DS NAME 1SG.OBJ.PRON
'Juan hit me'

b. ma Ø t-il q'a qin=i (SJA)
PROX B2/3S A2/3S-see CLF 1SG.PRO=LP
'He saw me' (Scott 2023; glosses adapted)

4.2 Peripheral arguments

Peripheral (oblique) arguments in Mam are introduced with relational nouns (RNs), which are roughly analogous to prepositions in other languages. As mentioned above, RNs have the distribution and function of prepositions in Mayan, although they are formally nouns which cross-reference their peripheral arguments with Set A morphology. The list of relational nouns in Todos Santos is given above in Table 14 in §3.7. The examples here show three cases where peripheral arguments are introduced with: (96) *e*, here used for indirect objects; (97) *u'ya*, here used for comitative arguments; and (98) *i'j* used here for oblique patients.

(96)	e-Ø-xi’	n-q’o-’n	tumil	ch-e	xjaal	t-iib’aj	iil
	COM-B2/3S-DIR	A1S-give-DS	idea	A2/3P-RN:PAT	man	2/3.A-RN:on	problem

‘I gave the people information about the problem’

(97)	e-Ø-jaw	n-tx’oma	chq’e’n	t-u’ya	jun	machet
	COM-B2/3S-DIR	A1S-cut	grass	B2/3S-RN:INST	INDF	SP:machete

‘I cut the grass with a machete’

(98)	ma	tz’-ok	t-juu-b’a	Juan	jun	tze’	w-i’j
	PROX	B2/3S-DIR	A2/3S-hit-APPL	NAME	INDF	stick	A1S-RN:OBL

‘Juan hit me with a stick’ (~ lit. ‘Juan used a stick to hit me’)

4.3 Voice

Mam uses a number of voices to mark valency changing operations. These include several passives, an antipassive, and an applicative, which has never yet been described in any other variety of Mam. The choice of voice is tightly correlated to transitivity, extraction, and reflexivity, and therefore this section will briefly treat with voice and how it is used in Todos Santos Mam.

4.3.1 Antipassive

The antipassive is marked with a verbal suffix *-(a)n*, which per England (1983b, *et seq.*) is glossed as ‘AP.’ When an antipassive clause is used, the valence is lowered by one, as the sentence is now intransitive; the patient/theme is reduced to an oblique RNP, and the subject is cross-referenced with the appropriate Set B marker. There are two RNs that usually head the oblique phrase that introduce the demoted patient/theme: *e* ‘RN:PAT’ and *i’j* ‘RN:OBJ’. The former is often encliticized to the antipassive verb, as in *=t-e*, pronouned [=tɐ].

(99) Transitive ~ antipassive alternation

a.	e-Ø-kub’	t-b’iyo-’n	xin	xjaal	jel	b’alam	(transitive)
	COM-B2/3S-DIR	A2/3S-kill-DS	CLF	man	CLF	jaguar	

‘The man killed the jaguar’

b.	Ja xin	xjaal	e-Ø-kub'	b'iyoo-n	t-e	(antipassive)
	DET CLF	man	COM-B2/3S-DIR	kill-AP	A-2/3S-RN:PAT	

	jel	b'alam
	CLF	jaguar

'It was *the man* who killed the jaguar'

The antipassive is required whenever an ergative argument is extracted to the left periphery of the clause (this fact will be picked up again in §6.1 on ergative extraction). (99b) above is an example of focusing the transitive subject to pre-predicate position. Consider the following triplet in (100), where the antipassive is required in only the case of ergative extraction (100c).

(100) Antipassive required only in cases of ergative extraction

a.	e-Ø-kub'	t-b'iyo-'n	xin	xjaal	jel	b'alam	(SVO)
	COM-B2/3S-DIR	A2/3S-kill-DS	CLF	man	CLF	jaguar	

'The man killed the jaguar'

b.	Ja jel	b'alam	e-Ø-kub'	t-b'iyo-'n	jel	b'alam	(absolutive)
	DET CLF	jaguar	COM-B2/3S-DIR	A2/3S-kill-DS	CLF	man	

'The man killed THE JAGUAR'

c.	Ja xin	xjaal	e-Ø-kub'	b'iyo-n=t-e	jel	b'alam	(ergative)
	DET CLF	man	COM-B2/3S-DIR	kill-AP=2/3PS.A-RN:PAT	CLF	jaguar	

'THE MAN killed the jaguar'

Strictly speaking, the antipassive suffix *-n* is not used solely to mark a valence change from transitive to intransitive with the demotion of the patient. England (1988) notes that the suffix may be used "lexically" (that is, without an oblique patient) when deriving intransitive verbs from nouns. This explains why sentences such as the following are marked with *-n* despite not being followed by an oblique.

(101)	e-Ø-tz	aq'ana-n=i	t-u'j	tiem	ee=x	(< *aq'untl* 'work')
	COM-B2/3S-DIR	work-AP	A2/3S-RN/in	year	go.out=go	

'You were working last year' (lit. '...in the year that went out')

The realization of the antipassive suffix is subject to a phonological restriction, whereby if its root of attachment contains a long or glottalized vowel (which will bear stress; see §2.3), the -*n* will not appear despite the clause still otherwise being an antipassive. In the following example, the fact that the clause is an antipassive is apparent based on i) the subject is cross-referenced with Set B; 2) there is no -*'n* 'DS' prefix which would mark it as a typical transitive; 3) the object is in an oblique RNP. My gloss reflects the fact that the antipassive morpheme is still contained within the verb.

(102)

Al	Ø-Ø-ok	che'ya	t-e	jun	pu't?
who	CØM-B2/3S-DIR	see.AP	A2/3S-RN:PAT	INDF	butterfly

'Who saw a butterfly?'

4.3.2 Passive

Mam dialects are known to vary number of passive suffixes. For Ixtahuacán Mam, England (1983b, 2017) notes *-eet, -t*, *-j*, -Ø as passives (as well as a processive passive *-b'aj*), and in Cajolá Mam there are several more attested (Pérez Vail 2014). In Mam, I have found evidence of at least those found in Ixtahuacán. In the passive, the patient is the sole argument, and is cross-referenced with Set B morphology. Agents may optionally be introduced by a relational noun *u'n* 'RN:AGT'.

(103)

lu=ta	b'uch	ya	ma	tz'-e=x	tch-**eet**
DEM=AFF	corn	already	PROX	B2/3S-DIR=DIR	grind.corn-PASS

'The corn is indeed already ground'

(104)

iil	t-i'j	k-tsy-**eet**-al	jel	shik	w-u'n
problem	B2/3S-RN:OBL	B2/3S-trap-PASS-POT	CLF	rabbit	A1S-RN:AGT

'I must trap the rabbit' (lit. 'The rabbit must be trapped by me')

(105)

Ti'	x-Ø-b'in-**t**	t-u'n	María
what	DIST-B2/3S-make-PASS	A2/3S-RN:AGT	NAME

'What did María make?' (lit. 'What was made by María?')

(106)

ma	Ø-jaw	tx'oma-**t**	xkoo'ya
PROX	B2/3S-DIR	cut-PASS	tomato

'The tomato is cut'

(107)

Ø-Ø-itz'{**-j/-Ø**}	María	Chnob'jal
CØM-B2/3S-be.born-PASS	María	Huehuetenango

'María was born in Huehuetenango'

Some verbs obligatorily appear in the passive voice, like *itz'-j/-Ø* 'be born', shown in example (107) above. Additionally, the verb 'to find' is never active, always rendered as *kn-et* 'found (by)' (108). The verb 'to do' (which expresses a variety of meanings such as buildnig, cooking and preparing) is always rendered as *b'in-t* 'done (by)', and must be causativized to function actively (109).

(108)	ma	Ø-kn-et	Juan	w-u'n			
	PROX	B2/3S-find-PASS	Juan	A1S-RN:AGT			
	'I found Juan'						

(109)	ma	Ø-b'in-t	jel	carro	t-u'n	txin	María
	PROX	B2/3S-do-PASS	CLF	car	A2/3S-RN:AGT	CLF	María
	'María fixed the car'						

4.3.3 Applicative

Todos Santos also has an applicative suffix *-b'a* which promotes an oblique argument to object status. The extent to which this suffix is present in other Mam varieties is unclear because to present knowledge it has never yet been described for Mam. The *-b'a* suffix is clearly derived from the pan-Mayan applicative suffix, reconstructed as **-b'e* by Mora-Marín (2003). The applicative suffix may not be used with *-'n* 'DS', which is otherwise seen in transitive clauses.

The applicative is used only to promote *instrument* obliques to become applied objects. Other kinds of transitive predicates (such as transfer of possesssion or benefactee relationships, found in other Mayan applicative constructions; for a review, see Coon 2016, §1.2.2) are not possible with the Mam applicative.

(110) Applicative *-b'a* in Todos Santos Mam

a.	ma	tz'-ok	t-juu-b'a	Juan	jun	tze'	w-i'j
	PROX	B2/3S-DIR	A2/3S-hit-APPL	Juan	INDF	stick	A1S-RN:OBL
	'Juan hit me with a stick'						

b.	ma	tz'-ok	t-yoo-b'a	Juan	las	t-tzii	tcheej
	PROX	B2/3S-DIR	A2/3S-tie-APPL	Juan	SP:rope	A2/3S-mouth	horse
	'Juan tied the horse's mouth with a rope'						

A verb suffixed with applicative *-b'a* need not have a pronounced applied object. Take, for example, the following sentence, where the instrument used for tying is omitted.

(111) Omitted applied object

ma	tz'-ok	n-yoo-b'a	kob'	waakxh
PROX	B2/3S-DIR	A1S-tie-APPL	some	cow

'I tied up some cows'

4.3.4 Other valency changing operations

Another noteworthy valency-changing operation in Mam is the causative. Mam has a number of causative suffixes that depend on root class (such as verbal, adjectival, or positional). A common and productive verbal causative suffixes is *-chV* (where "*V*" is a disharmonic vowel) (112). A common adjectival causativer is *-sV* (113). Positional roots have a dedicated causative suffix *-b'V* (114).

(112)

lu	qen	n-b'in-**chaa-**n	waab'j
DEM	1SG.PRO	INC-do-CAUS-AP	tortilla

'I am making a tortilla'

(113)

lu	qen	n-noj-**saa-**n	baso
DEM	1SG.PRO	INC-full-CAUS-AP	SP:glass

'I am filling the glass'

(114) Ø-Ø-tu-l-**b'aa**-n=k'a!
B2/3S-A2/3S-round-POS-CAUS-IMP=DIR
'Make it round!

There is a causative suffix with a meaning of incipience (called a "versive" by England 1983b, p. 111): *-Vx* (where here "*V*" is a fully harmonic vowel). This attaches to adjectival and intransitive verb roots.

(115)

ma	Ø-kub'	saq**-ax**	waab'j
PROX	B2/3S-DIR	white-VERS	food

'The food became white (rotten)'

Lastly in this section, we can contrast the many causative (valency-increasing) suffixes with an intransitivizing (valency-decreasing) suffix, namely *-paj* 'IV' .

(116) a. e-Ø-jaw t-si'ypu-'n jel b'alam jel txi'yaan
COM-B2/3S-DIR A2/3S-scare-DS CLF jaguar CLF dog
'The jaguar scared the dog'

b. ma chin jaw si'y**-paj**
PROX B1S DIR scare-IV
'I was afraid'

4.3.5 Reflexives

The reflexive in Todos Santos Mam is typically formed with the reflexive object *iib'* 'self.' Also possible is the use of the patient relational noun *i'j* 'RN:OBL'. The reflexive object takes possessive (Set A) to cross-reference the subject.

(117) ma tz'-el t-txjo-'n t-iib'=i
PROX B2/3S-DIR A2/3S-wash-DS A2/3S-self=LP
'You washed yourself'

(118) Kucha Ø-Ø-txjoo-m=el t-i'j=i
GO B2/3S-A2/3S-wash-IMP=DIR A2/3S-RN:OBL=LP
'Go wash yourself!'

(119) x-Ø-kub' n-tzqi'j-sa-'n w-iib'
DIST-B2/3S-DIR A1S-dry-CAUS-DS A1S-self
'I dried myself off'

(120) ma Ø-b'aj t-b'a'na t-iib' María
PROX B2/3S-DIR A2/3S-make.well.DS A2/3S-self María
'María cured herself'

Reflexives in rigidly VSO Mayan languages have generated considerable theoretical interest because clauses with reflexive objects are the only ones where VOS word order is possible (Craig 1977, England 1983b, Coon et al. 2014, Little 2020b, Royer 2022). In fact, in rigidly VSO languages, VOS word order is required when the object is reflexive (e.g. Q'anjob'al; see Coon et al. 2014). In Ixtahuacán Mam, this is also the case, as (121) below shows.

(121) Ixtahuacán Mam: reflexive object requires VOS word order

ma	Ø-kub’	t-b’iyoo-n	[*O* t-iib’]	[*S* xiinaq]
PROX	B2/3S-DIR	A2/3S-kill-AP	A2/3S-self	man

‘The man killed himself’

In Todos Santos Mam, however, either VOS or VSO word order are grammatical, as shown in the minimal pair below in (122). This is the only sentence type in which VOS word order is grammatical. See also §4.4 to follow.

(122) Todos Santos Mam: reflexive objects in VOS or VSO word order

a.

ma	tz’-el	t-eewa	Juan	t-iib’	(VSO)
PROX	2/3S-DIR	A2/3S-hide.DS	Juan	A2/3S-self	

‘Juan hid himself’

b.

ma	tz’-el	t-eewa	t-iib’	Juan	(VOS)
PROX	B2/3S-DIR	A2/3S-hide.DS	A2/3S-self	Juan	

‘Juan hid himself (same as 122a)’

As seen in the all above Todos Santos Mam examples, reflexive clauses are transitive, and require the transitive *-’n* ‘DS’ morpheme. Todos Santos, therefore, contrasts with other varieties of Mam, such as Ixtahuacán Mam, whose reflexive clauses are marked as with the antipassive *-n* but with Set A (England 1983b, pp. 186-188); England calls this “mixed valence.”

(123) “Mixed valence” reflexive clause in Ixtahuacán Mam

ma	kub’	t-b’iyoo-n	t-iib’	xiinaq
PROX	DIR	A2/3S-kill-AP	A2/3S-self	man

‘The man killed himself’ (England 1983b, p. 187; glosses adapted)

The reflexive object noun *iib’* ‘self’ is also used in reciprocal constructions, roughly equivalent to English ‘*each other*’.

(124)

e-tz’-ok	t-pju-’n	Juan	t-u’ya	Pablo	ch-iib’
COM-B2/3S-DIR	A2/3S-hit-DS	Juan	A2/3S-RN:COM	Pablo	A2/3P-self

‘Juan and Pablo hit each other’

Many Mayan languages also have so-called “extended reflexives” (terminology from Aissen 1999), in which the external argument is coreferential with the possessor of the internal argument. The terminology of "reflexive" is used due to this coreference, although this is not a reflexive construction in the traditional sense, as it does not use either of the reflexive object *iib'* 'self' or the relational noun that may be used instead, *i'j* 'RN:OBL'. In the extended reflexive in (125a) below, María sold her own cow, whereas in (125b) below, María sold another young woman's cow. The latter meaning is evidenced by the appearance of the classifier, which is not present in the extended reflexive.

(125) Mam extended reflexive

a.

ma	Ø-txi'	t-k'a'ya	María$_i$	t$_i$-waakxh
PROX	B2/3S-DIR	B2/3S-sell.DS	María	A2/3S-cow

'María$_i$ sold her$_i$ cow'

b.

ma	Ø-txi'	t-k'a'ya	María$_i$	t$_j$-waakxh	txin$_j$
PROX	B2/3S-DIR	B2/3S-sell.DS	María	A2/3S-cow	CLF

'María$_i$ sold her$_j$ cow'

Reflexives are sensitive to various syntactic constraints, which has been the subject of recent review by Royer (2022, Table 2). Reflexives may not extracted, e.g. under focus (125), or coordinated (126). Additionally, extracting an ergative subject is licit if the object is a reflexive, indicating that the EEC is somehow deactivated (127). These restrictions, coupled with the fact that they involve VOS order ins an otherwise rigidly VSO language has commonly been taken to indicate that reflexives must remain low in the structure to be bound locally by their antecedents.

(126) Reflexives may not be extracted

*ja	t-ii'b	Ø-Ø-el t	xjo-'n	Rosa
DEM	A2/3S-self	CØM-B2/3S-DIR	wash-DS	NAME

Intended meaning: 'It was herself that Rosa washed (not someone else)'

(127) Reflexives may not be coordinated

*Ø-Ø-che'ya	xin	b'inchal	t-iib'	t-u'ya	Rosa
CØM-B2/3S-see.DS	CLF	builder	A2/3S-self	A2/3S-RN:COORD	NAME

Intended meaning: 'The builder saw himself and Rosa'

(128) EEC is deactivated with reflexive objects

✓Al	s'-ok	ch-che'ya	ch-iib'?
who	DIST+B2/3S-DIR	A2/3P-see.DS	A2/3P-self

'Who saw themselves?'

4.4 Word order

Mayan languages are characterized by their verb-initiality. In her categorization of Mayan word orders, England (1991) groups the geographically contiguous Mamean and Q'anjob'alan languages as "fixed VSO". As a member of the Mamean branch, this means that that in broad focus or "discourse-neutral" contexts, Mam sentences with transitive verbs and explicit subjects and objects have rigidly VSO word order. This differs from other Mayan languages that are rigidly VOS (e.g. Tsotsil; Aissen 1987), and those that are VOS/VSO-alternating (e.g. Ch'ol; Coon 2010b).

Rigidly VSO languages are assumed to be an innovation among Mamean and Q'anjob'alan. Norman & Campbell (1978) propose that Proto-Mayan was a VOS/VSO-alternating language, where VOS was the "default" word order when S and O were of equal animacy, but VSO was the word order used when S outranked O in terms of animacy. (Modern Mayan languages that are VOS/VSO-alternating show VSO when the object is definite or more phonologically heavy; Quizar 1979, Larsen 1988). Languages in Mamean and Q'anjob'alan are considered to have reanalyzed the more marked (for Mayan) VSO order as the default (England 1991, Aissen 1992). In present-day Todos Santos Mam, we can see fixed VSO in the following sentences.

(129) Fixed VSO word order in Mam

a.

[e-Ø-xi'	t-laq'o-'n]$_V$	[xin	xjaal]$_S$	[paasb'il]$_O$
COM-B2/3S-DIR	A2/3S-buy-DS	CLF	man	hat

'The man bought the hat'

b.

*[e-Ø-xi'	t-laq'o-'n]$_V$	[paasb'il]$_O$	[xin	xjaal]$_S$
COM-B2/3S-DIR	A2/3S-buy-DS	hat	CLF	man

Indended meaning: 'The man bought the hat'
Can only mean: '?The hat bought the man'

The reflexive construction has often been cited as the one instance in rigidly VSO languages for which non-canonical VOS word order is required. In rigidly-VSO Q'anjob'al, for example, we see that although VSO is default, reflexive objects are required to be next to the verb (VOS).

(130) Transitive *vs.* Reflexive word order in Q'anjob'al (Coon et al. 2014, p. 226)

a. Transitive – VSO

Max	y-il[-a']	ix	ix	naq	winaq
ASP	3ERG-see-TV	CLF	woman	CLF	man

'The woman saw the man'

b. Reflexive – VOS

Max	y-il	s-**b'a**	ix	ix
ASP	3ERG	3ERG-self	CLF	woman

'The woman saw herself'

In Todos Santos Mam, *both* VSO and VOS word orders in reflexives are acceptable, and VSO word order is usually given by speakers first. Reflexive objects are the *only* objects which licitly occur in VOS sentences; other VOS word orders are ungrammatical refer also to §4.3.5.

(131) Reflexive word orders in Todos Santos Mam

a.

[ma	Ø-b'aj	t-b'a'na]$_V$	[t-iib']$_O$	[María]$_S$
PROX	B2/3S-DIR	A2/3S-make.well.DS	A2/3S-self	María

'María cured herself'

b.

[ma	Ø-b'aj	t-b'a'na]$_V$	[María]$_S$	[t-iib']$_O$
PROX	B2/3S-DIR	A2/3S-make.well.DS	María	A2/3S-self

Intended meaning: 'María cured herself'

Intransitive sentences in Mam are, expectedly, VS (133). Nonverbal predicates are also clause-initial: NVP-S (132). It is therefore more proper to say that Mam is a *predicate-initial* rather than simply a *verb-initial* language.

(132)

[ma	Ø-chim]$_V$	[jel	chiba]$_S$
COM	B2/3S-die	CLF	SP:goat

'The goat died'

(133)

[towsant]$_{NVP}$	[qen]$_S$
Todosantero	1SG.STAT.PRON

'I am a Todosantero'

In ditransitives, the indirect object follows the direct object (134). As a peripheral argument, the indirect object is introduced with a relational noun. Post-object is indeed the position of most peripheral arguments, such as instrumentals (135) or benefactives (136).

(134)	e-Ø-xi’	n-q’o-’n	tumil	ch-e	xjaal...
	COM-B2/3S-DIR	A1S-give-DS	idea	A2/3P-RN:PAT	man

‘I gave the people information...’

(135)	e-Ø-xi’	n-wa-’n	arroz	t-u’ya	xookb’il
	COM-B2/3S-DIR	A1S-eat-DS	SP:rice	A2/3S-RN:INST	fork

‘I ate the rice with a fork’

(136)	e-tz’-ok=tz	n-jqo-’n	pwert	t-witz	Juan
	COM-B2/3S-DIR=DIR	A1S-open-DS	SP:door	A2/3S-RN:BEN	NAME

‘I opened the door for Juan’

4.5 Negation

Mam has an extensive set of words used to negate, which are used in various, and usually non-overlapping, contexts. England (2017, pp. 524-525) presents some cross-dialectal comparison between Ixtahuacán (Northern), Ostuncalco (Southern), and Tacaná (Western) Mam varieties interestingly, we can see that cognate words are not used in the same negating context(s) across dialects. Some dialects additionally have innovated novel contexts which require a dedicated negator which others lack. Due to the number of negators, and the amount of variation, this corner of the grammar is particularly fruitful for cross-dialectal comparison.

Negation in Mayan has typically been understood to occupy a structural position in the clause higher than the T-domain, perhaps immediately so, and therefore negation does not necessarily exclude the use of aspect marking. In Ixtahuacán Mam, England (2013a) explains that in the negative polarity, aspect is not used, however this does not appear to be the case in Todos Santos Mam. I assume that clausal negators are base-generated as the neag of NegP but that negative quantifiers are DP-internal.

Table 16 below outlines the negators in Todos Santos Mam, and which categories they negate.

Table 16: Negation in Todos Santos Mam

Category of negation	Todos Santos
Statives Non-person NPs in focus	{nti'=x, nada=x
Locative existential	min'al
Person NPs in focus	naal=x
Verbs: statives	nya
Verbs: otherwise	mii'n ~ mi'
Not yet	naax, mix
Not one	minuq jun
Should not	lay
Cannot: unable/difficult	milay
Cannot: no knowledge	mixb'a

Negators that modify noun phrases or are themselves nominal must occur in clause-initial, pre-predicate position. Negators may also take the enclitic *=x* which I assume has some distributional meaning but for lack of concrete evidence of this, I gloss it here as just 'ENCL.'

(137)

nti'=x	dulce	e-∅-xi'	ch-waa-'n	qa	ne'
NEG=ENCL	SP:candy	COM-B2/3S-DIR	A2/3P-eat-DS	PL	young.child

'The children ate no candy.'

(138)

nti'	tiem	w-i'j
NEG.EXIST	time	A1S-RN:OBL

'I have no time' (lit. 'no time exists to me')

(139)

min'al	Harold	t-ja'
nobody	Harold	A2/3S-house

'Nobody is at Harold's house'

(140)

naal=x	ku'waal	e-∅-xi'	leera	t-i'j	u'jb'il
NEG=ENCL	child	COM-B2/3S-DIR	read	A2/3S-RN:OBL	book

'No child read a book'

Mii'n (also shortened to *mi'* by some speakers) is the standard verbal negator (141)-(142), and is therefore not used with non-verbal predication. This is the purview of the negator *nya* (143).

(141)

mii'n	x-∅-kub'	t-b'iyo-'n	xin	xjaal	jel	b'alam
NEG	DIST-B2/3S-DIR	A2/3S-kill-DS	CLF	man	CLF	jaguar

'The man didn't kill the jaguar'

(142)

mi'	e-∅-tz	t-lamo-'n	t-lameel	ja'
NEG	COM-B2/3S-DIR	A2/3S-close-DIR	A2/3S-lid	house

'I didn't close the door'

(143)

nya	xinaq	qen
NEG.STAT	man	1SG.PRO

'I am not a man'

The basic sentential negator *mii'n* is often used to modify the NP-focusing negator *nti'*, even though in such circumstances, it extends its usage outside of the VP. Such a usage is likely an intensifier, because it is not necessary (144). It is also possible that *nti'* is historically descended from a form such as **mii'nti'* (lit, 'not what'), judging by the fact that in Ixtahuacán Mam, England (1983b, 2017) reports a form *miti' ~ nti'* in Ixtahuacán used for verbal negation.

(144) Todos Santos Mam

(mii'n)	nti'	tumil	al	e-∅-xi'	waa-n	t-e	oj
NEG	NEG.EXIST	idea	who	COM-B2/3S-DIR	eat-AP	A2/3S-RN:PAT	avocado

'I have no idea who ate the avocado'

The following are negators which are newly reported here for Todos Santos Mam. First is *naax* 'NOT.YET' (151), which triggers an alignment split (see §5.2 for a discussion on super-extended ergativity). There is also *minuq jun* 'not one', which is a contraction of the negator *mii'n* + *nuq* 'only' (146). Next, I present *lay*, which means 'should not' (147), and *milay* (probably derived from *mii'n* + *lay*), which means 'cannot' when the meaning is that the task is too difficult or the agent is somehow unable to complete the task (148). If the agent has no knowledge of how to complete the task, the word for 'cannot' is *mixb'a* (149).

(145)

naax	t-uul	u'jb'il
not.yet	A2/3S-arrive.here	book

'The book hasn't arrived yet'

(146)

mi-nuq	jun	xjaal	b'a'n	t-chiimb'a
NEG-only	INDF	man	good	A2/3S-play.marimba

'Not one person can play the marimba'

(147)

lay	∅-txi	t-oona	María	jay
should.not	B2/3S-DIR	A2/3S-help	NAME	2SG.PRO

'María shouldn't help you'

(148)

Manuela	**mi'lay**	Ø-b'in-t		nadaara	t-u'j	a'
Manuela	cannot	B2/3S-make-PASS		SP:swim	A2/3S-RN:in	water

'Manuela can't (is unable to) to swim'

(149)

mixb'a	chin	i'y	t-u'j	a'
cannot	B1S	pass.by	A2/3S-RN:in	water

'I can't swim (I don't know how to)'

The negative imperative, as discussed above in §3.4.2, does not follow the typical imperative structure seen in positive imperatives. First, the negator used is *mii'n*, which is initial in the clause. Then, all the rest of the marking within the clause is identical to what it would be in a non-imperative clause, with the exception that there is no aspect marker. Further, the imperative suffix *-n* ~ *-m* is not used, and directionals are pre-verbal.

(150)

mii'n	tz'-ok	t-tzuyu-'n=i	txi'yaan!
NEG	B2/3S-DIR	A2/3S-touch=LP	dog

'Don't touch the dog!'

Lastly in this section, it is also of note how negation interacts with the potential aspect. When negated, a verb may not take the potential suffix. This is true in Todos Santos, and is also noted for Ixtahuacán Mam by England (1983b, p. 247). Likewise for SJA Mam, which has reanalyzed the potential B2/3S allomorph *k-/k'-* as aspect marking, Scott (2023) notes that even this reanalyzed marker, along with *-l*, is not used under negation. This failure of negated verbs to apear in the potential aspect is therefore a robust generalization across Northern dialects. From a theoretical perspective, it is possible to hypothesize that, since this complementary distribution is only seen in the potential aspect (and the potential aspect is somewhat unusual in Mam due to its linearization), negation and potential could be realizations of a single node, call it Polarity, which is systematically distinct from aspect. I leave this question aside for further research.

(151) Todos Santos Mam

mii'n	Ø-txi'	t-k'a-'n	jel	txi'yaan	a'
NEG	B2/3S-DIR	A2/3S-drink-DS	CLF	dog	water

'The dog will not drink water'

(152) Ixtahuacán Mam (England 1983b, p. 247)

mii'n Ø-tzaaj jb'aal ja'la
NEG B2/3S-come rain today
'It won't rain today'

(153) San Juan Atitán Mam (Scott 2023, p. 86)

Me'n chin wa-n=i
NEG.V B1S eat-AP=LP
'I will not eat'

5 Complex structures

Embedded clauses in Mam often show distinct aspect and person marking from matrix clauses; this typically correlates with a metric Nora England has called "degree of finiteness." England (2013b, 2017) characterizes embedded clauses in Mam along a "scale of finiteness", which leads to four types of subordinate clauses, from most to least finite: i) clauses which are structurally like matrix claues in terms of aspect and person marking; ii) clauses which have dependant aspect marking but normal person marking; iii) aspectless clauses which have extended ergative marking; and iv) clauses with an infinitival verb, with no aspect or person marking. In Todos Santos Mam, we find all such clauses, excepting type (ii), as Todos Santos has reanalyzed dependent aspect morphemes as matrix aspects with novel meanings (refer to §3.2 on aspect).

This section discusses all types of clause complements in Todos Santos Mam for comparison of its "scale of finiteness" with that of other Mam varieties.

5.1 Finite complements

Finite clausal complements are introduced by certain complementizers like *qa* 'COMP' (154) or a subset of the relational nouns which function as complementizers, such as *i'* (155). We also see them in relative clauses (156).

(154) e-Ø-tzaj t-q'oma María [qa ja xin xjaal e-Ø-kub
COM-B2/3S-DIR A2/3S-tell NAME COMP DEM CLF man COM-B2/3S-DIR

b'iyoo-n=t-e jel b'alam]
kill-AP=A2/3S=RN:PAT CLF jaguar
'María told me that the man killed the jaguar'

(155) n-chin b'iisa t-i' María [ma Ø chim]
INC-B1S be.sad A2/3S-RN:COMP María REC B2/3S die
'I'm sad that María died'

(156) n-tzq'i'n t-witz xinaq j=[ma Ø chim]
A1S-know A2/3S-face man DET= REC B2/3S die
'I know the man who died'

We also find examples of clausal complements which have person marking like in matrix clauses, but entirely lack aspect; these are not explicitly mentioned in England's (2013b, 2017) discussion of the scale of finiteness, but are common in cases of *control*. In subject control sentences like (157), the subject must be marked again in the subordinate clause with Set B; the infinitive may not be used. Object control is slightly more complicated, involving a complement clause headed by *t-u'n*, which triggers super-extended ergativity (see §5.1 below); the controlled object is within the embedded clause (158).

(157) w-aj [chin waa-n]
A1S-want B1S eat-AP
'I want to eat'

(158) w-aj [t-u'n t-xi' t-b'in-cha-'n txin María
A1S-want A2/3S-RN:COMP A2/3S-DIR 2/3SA-fix-CAUS-DS CLF NAME

jel carro]
CLF car
'I want María to fix the car'

Subject control may optionally take the structure of object control as well, shown in (159b). The structure typically given for subject control is in (159a).

(159) Subject control: two possible structures

a. w-aj [chin (jaw) maje']
A1S-want B1S DIR get.married
'I want to get married'

b. w-aj [t-u'n n-jaw maje']
A1S-want A2/3S-RN:COMP A1S-DIR get.married
'I want to get married' (lit. 'I want that I get married')

5.2 Aspectless clauses and super-extended ergativity

All Mayan languages have ergative-absolutive alignment, and display some degree split ergativity (Coon 2013, Zavala 2017). Zavala reports that across the family, splits are governed by a variety of phenomena: aspect (e.g. Poqomam), clause type (e.g. Mam), inherent features of arguments (e.g. Mocho'), and inherent features of the predicate (e.g. Ch'ol).

In Mam, split ergativity is triggered in certain, but not all, embedded clauses. A large body of work by England (1983a,b, 1988, 1989, 2007, 2013a,b, 2017) has shown that these embedded clauses are not ergative-absolutive, but have a configuration whereby Set A marking extends to mark all arguments. That is, Set A, which is typically only used to cross-reference transitive subjects, is "extended" in these contexts to mark both intransitive subjects *and* transitive objects as well. Because all arguments are marked the same, this pattern is technically a neutral alignment where ergative/Set A is the marking used. This has been called "super-extended ergativity" by England (2017) to contrast to the "extended ergativity" seen in other Mayan languages which have nominative-accusative alignment in split contexts.

Although England's work describes the pattern in Ixtahuacán Mam, the pattern exists across Mam dialect areas (described in Cajolá Mam by Pérez Vail 2014, p. 27, and Tacaná Mam by Godfrey 1981, p. 53), as well as in other Mamean languages such as Awakatek (England 1983b, Larsen 1981) and Teko (Pérez Vail 2007). Outside of Mamean, the pattern is unattested in Mayan (Zavala 2017, p. 239).

England (1983a) traces the historical development of this system by comparative analysis with other closely-related Mamean languages Awakatek and Ixil. According to her account, originally, the split ergativity pattern in aspectless embedded clauses was an accusative pattern, whereby agents and subjects were marked with Set A and objects were marked with Set B; this is still the case in Ixil. However, in Mam, this system was overgeneralized due to its use of directional auxiliaries, perhaps due to clause union. Specifically, because the clause now included a directional auxiliarunsoy derived from an intransitive verb, it was possible to extend the accusative pattern of marking intransitive subjects with Set A to the "subject" of the intransitive directional, which is actually the the locus of object marking.

Todos Santos Mam differs from more conservative Mam varieties like Ixthuacán Mam in that Set A marking on the object in super-extended ergative contexts is also default. Scott (2023) has called this "Default Set A." Like for Default Set B (refer to §4.1.1), the Set A morpheme used to cross-reference the object is actually the default 2/3rd person singular *t-* regardless of the features of the transitive object. In Ixtahuacán Mam, which has neither Default Set B nor Default Set A, the Set A morpheme marking the object in super-extended ergatiive contexts faithfully cross-references the appropriate person and number features of the transitive object.

(160) Ixtahuacán Mam: super-extended ergativity with "Expected Set A"

Intransitive

a. o **chin** poon=a
COM B1S arrive.there=LP
'I arrived there'

b. n-**chi** ooq' aj [**n-**poon=a]
INC-B2/3S cry when A1S-arrive.there=LP
'They were crying when I arrived there'

Transitive

a. ma **chin** ok **t-**tzeeq'a-n=a
PROX B1S DIR A2/3S-hit-DS=LP
'You hit me'

b. o chin ooq'=a aj [**n-**kub' **t-**tzeeq'a-n=a]
COM B1S cry=LP when A1S-DIR A2/3S-hit-DS=LP
'I cried when you hit me'

(161) Todos Santos Mam: super-extended ergativity with "Default Set A"

Intransitive

a. e-**tz-**uul Pedro
COM-B2/3S-arrive.here Pedro
'Pedro arrived here'

b.	n-tzqi'n	t-u'n	[**t**-uul	Pedro]
	A1S-expect	A2/3S-RN:COMP	A2/3S-arrive.here	Pedro

'I expect Pedro to arrive'

<u>Transitive</u>

a.	e-**tz'**-ok	**t**-che'ya	xin	xjaal
	COM-B2/3S-DIR	A2/3S-see.DS	CLF	man

'The man saw me'

b.	w-ajb'ee'	mii'n	t-u'n	[**t**-ok	**t**-che'ya	xin	xjaal	**na'ya**]
	A1S-prefer	NEG	A2/3S-RN:COMP	[A2/3S-DIR	A2/3S-see.DS	CLF	man	1SG.PRON

'I prefer that the man not see me'

Below are some examples of the super-extended ergativity pattern, broken down by which subordinator triggers the split: fronted adverbials (162-164), the complementizer *t-u'n* (165)-(166), the complementizer *oj* (167)-(168), and the modal *b'a'n* which means 'can, be able to; must' in these contexts (169)-(170). Note that not every subordinator triggers super-extended ergativity. Under a current theoretical assumption, each trigger idiosyncratically embeds an aspectless complement, which creates the necessary environment for super-extended ergativity.

Fronted adverbials

(162)	xina	**t**-kub'	q'eq'-ax	waab'j
	almost	A2/3S-DIR	black-VERS	tortilla

'The tortilla is almost black'

(163)	Ch'ix=k'a	**n**-poon	tu'wna
	almost=EMPH	A1S-arrive.there	inside

'I'm almost inside'

(164)	Naax	**t**-uul	u'jbil
	NOT.YET	A2/3S-arrive.here	book

'The book hasn't arrived yet'

Complementizer *t-u'n*

(165)	s-uul	t-u'j	t-k'u'j	Pedro	t-u'n
	DIST+B2/3S-arrive.here	A2/3S-RN:in	A2/3S-stomach	NAME	2/3.A-RN:COMP
	t-xi'	**t**-oona	jay		
	A2/3S-DIR	A2/3S-help	2PS.PRON		

‘Pedro remembered to help you’[4]

(166)	B’a’n	t-u’n	**q-**cantaara	t-kaab’-il
	B’A’N	2/3.A-RN:COMP	1P.A-SP:sing	2/3.A-two-NMLZ

‘We can sing at the same time’

Complementizer *o’j*

(167)	mas	b’a’n	o’j	**w-**uul	jya’x
	SP:more	good	when.FUT	A1S-arrive.here	early

‘It’s better that I arrive early’

(168)	chin	jaw-il	b’iisa	o’j	**t-**ee=x	t-e=y
	B1S	DIR-POT	be.sad	when.FUT	A2/3S-go.out=go	A2/3S-RN:GEN=LPS

‘I will be sad when you leave’

***B’a’n* (‘be able to’; ‘good’)**

(169)	B’a’n	**t-**ook=tz=i	q-u’ya=na
	B’A’N	A2/3S-enter=DIR=LP	A1P-RN:COM=EMPH

‘You can come with us’

(170)	B’a’n	**t-**ok	t-q’o-’n	txi’yaan	ch’aq	q-i’j
	B’A’N	A2/3S-DIR	A2/3S-give-DS	dog	flea	A1P-RN:OBL

‘The dog could give us fleas’

(171)	B’a’n	**q-**xi’	t-u’j	q-qen
	B’A’N	A1P-go	A2/3S-RN/in	A1S-leg

‘We must go on foot’

5.3 Nonfinite clauses

Lastly, we treat with nonfinite clauses, the far end of the spectrum on England’s “scale of finiteness.” These clauses, like those in §5.2, lack aspect marking, however their main verbs are infinitival, and take the infinitival *-(V)l* suffix. As such, there is additionally no Set A or Set B

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[4] This is an idiom for ‘remember to...’ literally meaning ‘it arrives in my stomach that...’ The idiom for ‘forget to...’ also involves the stomach, literally being ‘it left my stomach that...’ Munro (p.c.) reports a similar idiom for ‘remember to...’ in Q’anjob’al.

marking, or directionals.[5] These infinitival main verbs may still take objects, but these are necessarily oblique, as indicated by relational nouns which may introduce them. Some examples are given below.

(172)	ma	chi-'x	w-e='ya	[q'olb'ee-l	t-e	n-ya'=ya	]
	PROX	B1S-go	A1S-RN=LP	greet-INF	A2/3S-RN:PAT	A1S-grandmother=LP	
	'I must go visit my grandmother'						

(173)	Oojat	Ø	txi'	txin	María	[b'in-chaa-l	t-e	jel	carro	]
	I.HOPE	B2/3S	go	CLF	NAME	do-CAUS-INF	2.3S.A-RN:PAT	CLF	SP:car	
	'I hope María goes to fix the car'									

(174)	xhin	i'y	[laq'oo-l	t-u'j	k'a'yb'il	]
	DIST+B1S	pass.by	buy-INF	A2/3S-RN:in	store	
	'I passed by to buy (something) from the store'					

(175)	mas	b'a'n	[yo'l-al	]
	SP:more	good	talk-INF	
	'It's better to talk'			

6 Extraction

6.1 Syntactic ergativity

As stated in §4.1, one of the features which typically distinguishes those Mayan languages with pre-verbal Set B from those languages with post-verbal Set B is the presence of *syntactic ergativity*, the inability to extract an ergative agent without some form of repair. This constraint on structure, called the *ergative extraction constraint* (EEC) is also present in Mam, including Todos Santos Mam, despite the fact that its set B marking differs from other high-abs languages (see §4.1.1 for a discussion of Expected Set B *vs.* Default Set B agreement patterns).

The following examples demonstrate how the EEC functions in a typical high-absolutive variety of Mam, Ixtahuacán Mam.

[5] This is not to say that all languages – and indeed not all *Mayan* languages – may not have inflected infinitives. It just happens to be the case for Mam we do not see these.

(176) Ixtahuacán Mam: EEC active (England 1983a)

a.

ma	chi	kub’	t-tzyu-’n	xiinaq	qa=cheej	(baseline)
PROX	B2/3P	DIR	A2/3S-grab-DS	man	PL=horse	

‘The man grabbed the horses’

b.

xiinaq	s-uul	(subj. extr.)
man	DIST+2/3P-arrive.here	

‘The *man* arrived here’

c.

qa=cheej	xhi-kub’	t-tzyu-’n	xiinaq	(obj. extr.)
PL=horse	DIST+B2/3P-DIR	A2/3S-grab-DS	man	

‘The man grabbed *the horses*’

d.

xiinaq	x-∅-kub’	tzyuu-**n**	**t-e**	qa=cheej	(agent extr.)
man	PROX-B2/3S-DIR	grab-AP	A2/3S-RN:PAT	PL=horse	

‘*The man* grabbed the horses’

As can be seen above, only intransitive subjects and transitive object may front without repair. When attempting to extract an transitive subject, however, the picture is more complicated, as Mam is subject to the EEC (176d). To skirt the EEC, Mam renders the sentence in the antipassive: as such, object is demoted to an oblique, and therefore the subject which must fronts is no longer ergative, but simply absolutive (176d).

Todos Santos Mam works similarly, indicating that the variation between Expected *vs.* Default Set B does not affect whether the EEC is obeyed.

(177) Todos Santos Mam: EEC active

a.

e-∅-kub’	t-b’iyo-’n	xin	xjaal	jel	b’alam	(baseline)
COM-B2/3S-DIR	A2/3S-kill-DS	CLF	man	CLF	jaguar	

‘The man killed the jaguar’

b.

ja	xin	xjaal	e-∅-poon	(subj. extr.)
DEM	CLF	man	COM-B2/3S-arrive.here	

‘*The man* arrived’

c.

ja	jel	b’alam	e-∅-kub’	t-b’iyo-’n	(obj. extr.)
DEM	CLF	jaguar	COM-B2/3S-DIR	A2/3S-kill-DS	

xin	xjaal
CLF	man

‘The man killed *the jaguar*’

d. ja	xin	xjaal	e-Ø-kub'	b'iyoo-n	t-e	(agt. extr.)
DEM	CLF	man	COM-B2/3S-DIR	kill-AP	A2/3S-RN:PAT	

jel	b'alam
CLF	jaguar

'*The man* killed the jaguar'

England (2017, p. 522) notes that in the vast majority of Mam dialects, the thematic agent controls verb agreement within the antipassive. In the example in (178), the fronted noun phrase *aa xinaq* 'the men' controls plural agreement within the antipassive verbal complex, as evidenced by the appearance of the 2/3rd person Set B morpheme *chi*.

(178) Ixtahuacán Mam (England 2017)

aa	xiinq	ma	**chi**	tzyuu-n	ky-i'j	cheej
DEM	man	PROX	**B2/3P**	grab-AP	A2/3P-RN:OBL	horse

'It was the men who grabbed the horses'

However there appears to be some dialectal varitation in this respect. In Tacaná (Western), the antipassive verb is always marked for the B2/3S form, notwithstanding the features of the actual agent and patient (179). England suggests that this pattern indicates a biclausal structure in which the verb indexes the first clause.

(179) Tacaná Mam (England 2017, p. 523, citing Munson 1984; glosses adapted).

aa'e'	ma'	**tz'**-ok	b'ujuu-n=t-e	q-ee
they	PROX	**B2/3S-**DIR	hit-AP=A2/3S-RN:PAT	A1P-RN:PAT

'It was they who hit us'

Which argument controls agreement under ergative extraction in Todos Santos has been the topic of some confusion, as the only previous documentation of the phenomenon for this dialect, Canger (1969), gives only sparse data. From one example, it appears as though the Set B marking on the verb cross-references the patient, which is also expressed as an RNP (180). It would be unexpected for an oblique to control agreement in this way.

(180) Todos Santos Mam (England 2017, p. 523, citing Canger 1969, p. 111; glosses adapted)

na'yan	e	Ø-kub'	b'yo-n	t-e	n-man
1SG.PRON	COM	B2/3S-DIR	hit-AP	A2/3S-RN:PAT	A1S-father

'It was I who hit my father'

England writes that it is possible, though unclear, that in Todos Santos Mam the antipassive verb can also be marked for a plural patient (i.e. with the B2/3P marker *chi*), as well as the singular one, however the only example given in Canger (Canger 1969, p. 130) on 1960's Mam is troubling: it gives *chi* on the verb, however the patient is given as a relational noun marked with the singular, and is translated by Canger in the singular. In his survey of voice and ergativity in Mayan languages Dayley (1983, p. 45), assumingly citing Canger's data, leaves off the singular relational noun phrase and translates the sentence with a plural patient. It is unclear as to whether Dayley was correcting Canger's earlier error, or whether they were both, in different ways, incorrect.

(181) Unclear example from Canger/Dayley (Todos Santos Mam)

a. (Canger 1969, p. 130)

na'yan	ma	chi	kub'	b'yo-on	t-e
1SG.PRON	PROX	B2/3P	DIR	hit-AP	A2/3S-RN:PAT

'I killed him' (*sic.*: Canger's translation)

b. (Dayley 1983, p. 45)

na'yan	ma	chi	kub'	b'yo-on
1SG.PRON	PROX	B2/3P	DIR	hit-AP

'I was the one who hit them' (*sic.*: Dayley's translation)

In any case, with new data, I can address this issue clearly. In present-day Todos Santos Mam, it appears to be the case that Set B marking in the antipassive may licitly agree with either the semantic subject *or* simply be Default Set B (182a). This is evidenced by both agreement strategies being acceptable by native speakers without any difference in acceptability or meaning. On the other hand, it is *not* possible, contra Dayley (1983), for the patient to control agreement (182b).

(182) Different strategies for Set B agreement in the antipassive

a.

Na'ya	e-{**tz'-/chin-**}ok	pjuu-n=t-e	qa	xin	xjaal
1SG.PRON	COM-{B2/3S-/B1S-}DIR	hit-AP=A2/3S-RN:PAT	PL	CLF	man

'It was I who hit the men'

b.

*Na'ya	e-**chi**	ok	pjuu-n=t-e	qa	xin	xjaal
1SG.PRON	COM-3P.B	DIR	hit-AP=A2/3S-RN:PAT	PL	CLF	man

Intended meaning: 'It was I who hit the men'

6.2 Questions

In this section, I outline questions in Todos Santos Mam. §6.2.1 describes *wh*-questions and *wh*-movement; §6.2.2 describes long-distance *wh*-extraction, and §6.2.3 describes the formation of polar questions.

6.2.1 *wh*-questions

Mam forms *wh*-questions by means of a suite of *wh*-words which must appear in clause-initial position. Table 17 below lists the *wh*-words in Todos Santos Mam.

Table 17: *wh*-expressions in Todos Santos Mam

wh-word	Meaning
al	who
alchee	which
ti'(=jelil)	what
ja'(=tumil)	where
ti'n	why, how
(t-u'n) teqa	why (for what reason)
jtoj	when (future)
jtoo	when (non-future)
ni'y(=x)	when (what time?)
jte'	how many
nich'in	how much

(183)	Al	s'-aj	laq'oo-n=t-e	k'um
	who	DIST+A2/3S-DIR	buy-AP=A2/3S-RN:PAT	güicoy

'Who bought the güicoy?'

(184)	Alchee	xuuj	t-aj	Juan?
	which	woman	A2/3S-want	NAME

'Which girl does Juan like?'

(185)	Ti'	e-Ø-b'aj	ewa?
	what	COM-B2/3S-finish	yesterday

'What happened yesterday?'

(186) Ja' x-Ø-kw'=a' t-q'o-'n=i lapis?
where DIST-B2/3S-DIR=DIR A2/3S-give-DS=LP SP:pen
'Where did you put the pen?'

Two common *wh*-expressions *ti'* 'what?' and *ja'* 'where?' often appear in longer forms, in combinatifon with clitics with which they are specificially collocated. *Ti'* takes *=jelil*, an unknown morpheme I gloss simply as 'ENCL' for "enclitic" (187), and *ja'* takes *=tumil*, which literally means 'idea' (188). While the distribution of the shorter and longer forms is somewhat unclear, the longer forms are judged by speakers to be more forcefu, somewhat equivalent to English's 'what/where *in the world*...?' In the nearby variety SJA Mam, it appears as though these words have been rebracketed, and appears only as *tijil(al)* and *jatum*, respectively (Scott, p.c.).

(187) Ti'=jelil ma Ø-ku'=x t-xk'o-'n María?
what=ENCL PROX B2/3S-DIR=DIR A2/3S-cook.on.comal-DS María
'What on earth is María cooking on the comal?'

(188) Ja=tumil n-Ø-xi' t-xoo-'n t-e=y xaq?
Where=idea INC-B2/3S-DIR A2/3S-throw-DS A2/3S-RN:GEN=LP rock
'Where are you throwing rocks?'

There are two ways to express the meaning 'why': *ti'n* and (*t-u'n*) *teqa*. The former is simply 'why', and the latter is more appropriately translated as 'for what reason', as it optionally uses the relational noun complementizer *t-u'n*.

(189) Ti'n ma Ø-txi' q'a Juan?
why PROX B2/3S-go CLF NAME
'Why did Juan go?'

(190) t-u'n teqa s'-ok t-jqo-'n Juan
A2/3S-RN:REASON what.reason DIST+B2/3S-DIR A2/3S-open-DS Juan

t-lameel ja'?
A2/3S-lid house
'For what reason/why did Juan open the door?'

Mam has two basic ways of expressing 'when?', one for future questions (*jtoj*), and one for non-future questions (*jtoo*). This mirrors the fact that it has several complementizers also meaning ‘when’: *taj* for non-future events and *oj* for future events. Neither *jtoj* not *jtoo* is may co-occur with aspect marking. Additionally, we find the word *ni’y(=x)*, meaning ‘what time’ (193) – that is, *ni’y(=x*) is used to ask about times during the day of utterance time, whereas *jtoj* and *jtoo* are used for periods other than the day including the utterance time.

(191)	jtoj=tza	k-jaw-il	t-e=y	ja’
	when.FUT=well	B2/3S-go.up-POT	2.3S.A-RN:GEN=LP	house

‘Well, when will you build the house?’

(192)	jtoo	∅-b’aj	b’in-t	k’ixh	t-u’n	María?
	when.NONFUT	B2/3S-DIR	do-PASS	fish	A2/3S-RN:AGT	María

‘When did María cook fish?’

(193)	Ni’y=x	t-kub’	t-b’in-cha-’n	María	jun	chme’y?
	what.time=ENCL	A2/3S-DIR	A2/3S-do-CAUS-DS	María	INDF	turkey

‘What time is María preparing the turkey?’

There is a split between ‘how much?’ and ‘how many?’ in Mam, which is not seen in certain Mayan languages: the former is *nich’in* and the latter is *jte’*.

(194)	nich’in	q’otj	tz’-aj	t-laq’oo-n=a
	how.much	masa	B2/3S-DIR	A2/3S-buy-DS=LP

‘How much masa did you buy?’

(195)	jte’	pelot	s’-ok	t-xjo-’n	q’a	Juan
	how.many	ball	DIST+B2/3S-DIR	A2/3S-kick-DS	CLF	Juan

‘How many balls did Juan kick?’

There is an additional strategy to form *wh*-arguments, which involves combing the *wh*-element *al*, which by itself just means ‘who’, and combining it with a relational noun which is unmarked with Set A; this construction, which still fronts *al*+RN to clause-initial position, is a case of pied-piping with inversion (PPI), a feature first observed in Mesoamerican languages by Smith Stark (1988). Not only is its PPI of interest to this construction, but also the fact that RNs occur without their associated Set A marking: everywhere else in Mam, RNs must be marked with the appropriate Set A. For all speakers, the *al*+RN sequence is pronounced as if one word (that is, with no glottal stop inserted at the beginning of the RN) indicating lexicalization of the entire unit. Not all combinations of *al*+RN are possible, however: for example, *al-e* ‘whose?’ (196) and *al-*

u'ya 'with whom?' (197) are licit, whereas the intended **al-witz* 'for whose benefit?' is not grammatical (compare 198 with 199).

(196)	Al	(*t-)e	t-anb'a	e-Ø-chim?	
	who	A2/3S-RN:GEN	A2/3S-sister	COM-A2/3S-die	
	'Whose sister died?'				

(197)	Al	(*t-)u'ya	x-Ø-yo'la	Teresa?	
	Who	A2/3S-RN:COM	DIST-B2/3S-talk	NAME	
	'With whom did Teresa just speak?'				

(198)	Al	(*t-)e	s'-ok=tz	t-jqo-'n	ja'?
	who	A2/3S-RN:DAT	DIST+B2/3S-DIR=DIR	A2/3S-open-DS	house
	'For whom did you open the house?'				

(199)	*Al	witz	s'-ok=tz	t-jqo-'n	ja'?
	who	RN:BEN	DIST+B2/3S-DIR=DIR	A2/3S-open-DS	house
	Intended meaning: 'For whom did you open the house?'				

It is not possible to strand a relational noun, fronting just the *wh*-expression. The question as to why there should be any lack of possessive/genitive (Set A) marking on the RN in the PPI contexts is currently unexplained; I leave the topic for future research.

(200) Stranding of RN not possible: PPI required

a.	**Al**	**e**	e-Ø-xi'	t-q'o-'n	t-e=y	pwaq?
	who	RN:DAT	COM-B2/3S-DIR	A2/3S-give-DS	A2/3S-RN:GEN=LP	money
	'Who did you give the money to?'					

b.	*Al	e-Ø-xi'	t-q'o-'n	t-e=y	pwaq	**t-e**?
	who	COM-B2/3S-DIR	A2/3S-give-DS	A2/3S-RN:GEN=LP	money	A2/3S-RN:DAT
	Intended meaning: 'Who did you give the money to?'					

6.2.2 Long-distance *wh*-extraction

In Mam, extracting a *wh*-phrase from a lower clause is possible, however crossing two embeddings is not. Below is an example of *wh*-extraction from a single embedding.

(201) Extraction from an embedded clause

a.

W-aj	tz-uul	Pedro	t-u'j	tnum
A1S-want	B2/3S-arrive.here	Pedro	A2/3S-RN:in	pueblo

'I want Pedro to come to town'

b.

Al$_i$	t-e=y	t-aj	tz-uul	____$_i$	t-u'j	tnum?
who	A2/3S-RN=LP	A2/3S-want	B2/3S-arrive.here		A2/3S-RN:in	pueblo

'Who do you want to come to town?'

However, if the *wh*-phrase would shift twice, it may not extract, as shown in (202).

(202)

*Ti'=jelil	Ø-Ø-tzaj	t-q'ooma	Juan	e-Ø-tz	t-laq'o-'n	María?
What=ENCL	CØM-B2/3S-DIR	A2/3S-say.DS	Juan	COM-B2/3S-DIR	A2/3S-buy-DS	María

Intended meaning: 'What did Juan say that María bought?'

To repair this sentence, speakers employ a variety of options. The first is to put the first clause into a quotative-like expression, using the defective verb *tchi'* 'say' in the right periphery, as in (203). Critically, I do not consider this construction to contain multiple embeddings; rather, I assume it is bi-clausal, as indicated by the comma.

(203)

Ti'=jelil	e-Ø-tz	t-laq'o-'n	María,	t-tchi'	Juan
What=ENCL	COM-B2/3S-DIR	A2/3S-buy-DS	María,	A2/3S-SAY	Juan

'What did Juan say that María bought?' (lit. 'What did María buy, Juan said?')

The second repair for this type of sentence is to turn it into a polar question, as in the following sentence. (Although this looks formally like a *wh*-question with *ti'* 'what?', it can be answered with 'yes'/'no'. The phrase *ti' took* is an idiomatic way of saying 'what does one think?')

(204) Ti'	t-ook	t-u'n	Juan	ma	Ø-tzaj	t-laq'o-'n	María
what	A2/3S-enter	RN:COMP	JUAN	PROX	A2/3S-DIR	A2/3S-buy-DS	María

arroz?
rice
'Does Juan think María bought rice?' (~lit. 'What does Juan think if María bought rice?')

6.2.3 Polar questions

Todos Santos Mam uses the polar question particle =*ma* 'Q' to form yes/no questions. Like all other interrogative particles in Todos Santos, =*ma* is strictly second-position: it cliticizes to the first word in the clause.

(205) Polar question particle =*ma*

a.

e-Ø-kub'	t-b'iyo-'n	xin	xjaal	jel	b'alam
COM-B2/3S-DIR	A2/3S-kill-DS	CLF	man	CLF	jaguar

'The man killed the jaguar'

b.

e-Ø-kub'=**ma**	t-b'iyo-'n	xin	xjaal	jel	b'alam?
COM-B2/3S-DIR=Q	A2/3S-kill-DS	CLF	man	CLF	jaguar

'Did the man killed the jaguar?'

There are also two other interrogative particles with the same linearization as =*ma*. The first is =*pa*, which may also be used to create polar questions (206), but also has a somewhat broader usage. First, it may be appended to *wh*-words, where it does not apparently contribute any additional interrogative meaning: here it might function as a *wh*-question-specific emphatic particle (207). Last, it may contribute the meaning that the speaker is unsure about the verbal event (208); it is often translated by speakers by *tal vez* 'maybe'. For these reasons, for this reason I gloss =*pa* as 'INT' for "interrogative."

(206) ewa=pa	Ø-Ø-aaj	Juan?
yesterday=INT	CØM-B2/3S-return	NAME

'Did Juan return yesterday?'

(207)	Alchee=pa	ma	tz'-aaj?
	who=INT	PROX	B2/3S-arrive
	'Who returned yesterday?'		

(208)	At=pa	Harold	t-ja'
	EXIST=INT	NAME	A2/3S-house
	'Harold might be at home'		

There is also the second-position dubitative particle =*la*, which does not form polar questions, but rather only imports the meaning that the speaker is unsure about the verbal event (209). When it attaches to *wh*-words, it can also create rhetorical questions (210). Its linearization, like those of =*ma* and =*pa*, is strictly second position, as we can see from the bimorphemic *wh*-word *ti'=jelil*, because it must come between *ti'* 'what?' and the clitic =*jelil* '?' (211).

(209)	K-w'-el=la	t-tz'i'b=i	u'jb'il
	B2/3S-DIR-POT=DUB	2/3.SA-write.DS=LP	book
	'You might write a book'		

(210)	Al=la	Ø-Ø-waa-n=t-e	oj?
	who=DUB	CØM-B2/3S-eat-AP=A2/3S-RN:PAT	avocado
	'Who could've eaten the avocado?'		

(211)	Ti'=la=jelil	Ø-Ø-xi'	t-wa-'n	Noé
	what=DUB=ENCL	CØM-B2/3S-DIR	A2/3S-eat-DS	Noah
	'I don't know what Noah ate'			

6.3 Topic and focus

As discussed in §4.4., Mam word order is rigidly VSO in broad focus. Two constructions, however, regularly subvert this word order by means of some element in pre-predicate position: namely, topic and focus (Norman 1977, Norman & Campbell 1978, Aissen 1992). These constructions are present across Mayan, and have properties unique to each. As described by seminal decriptive and theoretical work by Aissen (1992) on Tsotsil, *focus* involves the focused phrase overtly moving to focus position (assumed to be Spec,TP) and binding a covalued trace. On the other hand, a *topic* phrase is not moved, but rather is merged directly in topic position (assumed to be Spec,CP) where it binds a covalued resumptive pronoun. These differential structures have distinct predictions for the grammar: while an ergative agent may not be focused in a language like Mam which obeys the ECC, we can expect that it may be topicalized. Indeed, this prediction is borne out.

First, we look at topic position. A topic construction may be identified by a pre-verbal argument and the presence of an (optional) resumptive pronoun in the position where the pre-verbal argument would be expected had there not been the argument in topic position. In (212a), *María* is in VSO subject position. In (212b), however, we see *María* is in topic position, giving rise to SVO word order; the resumptive classifier pronoun *txin* is pronounced in post-verbal subject position. Note that although the ergative agent is in topic position, there is no antipassive, and the verbal complex is marked transitively: this is the final diagnostsic for topic position, which, according to Aissen (1992), is not a position to which an argument must overtly *move*.

(212) Topic word orders

a.	e-∅-xi’	t-leera	María	u’j	(broad focus VSO)
	COM-B2/3S-DIR	A2/3S-read.DS	María	book	
	‘María read the book yesterday’				

b.	María$_i$	e-∅-xi’	t-leera	(txin$_i$)	u’j	(topic SVO)
	María	COM-B2/3S-DIR	A2/3S-read.DS	CLF	book	
	‘María, she read the book yesterday’					

Now we turn to focus, which is most often used to answer *wh*-questions. The syntactic configuration for focus is similar to that of topic but involves movement. The focused DP moves to pre-verbal position; the focused DP must co-occur with the demonstrative *j=*, which combines with a vocalic morpheme that contains person and number information. These forms are shown in Table 18, repeated from Table 15 above. The form which is particularly of note is that for the first person singular: no *j*-initial variant is present, and only the suppletive pronoun *na’ya* is used.

Table 18: Person marking under focus

		sg	pl
1	excl	**na'ya**	**jo'=y(a)**
1	incl		**jo'**
2		**ja=y**	**je=y**
3		**ja** CLF	**je** CLF

It seems as though these demonstrative elements are morphologically complex. In other nearby dialects, such as SJA and Ixtahuacán, the equivalent focusing demonstrative consists solely of the vocalic element. Because *j=* not only attaches to DPs, but may also introduce relative clauses (see §6.4 below), it is possible that these focusing elements are in fact relative clauses; this is reflected in my translations of focused clauses which use pseudo-clefts.

(213)

(*Ja)	Naya	Ø-Ø-el	txjo-'n	w-iib'
DEM	1SG.PRON	CØM-B2/3S-DIR	wash-DS	A1S-self

'It was I who washed myself'

(214)

Ja=y	k-tz-el	qb'a'-n=t-e	ja=tumil	k-w'-el=ix
DEM=LP	B2/3S-DIR-POT	tell-AP=A2/3S-RN:PAT	where=idea	B2/3S-DIR-POT=DIR

n-tzqi'j-sa-'n	qa	w-i'j
A1S-dry-CAUS-DS	PL	A1S-clothing

'It's you who's going to tell me where on earth I'm supposed to dry my clothes'

(215)

Ja	xin	xjaal	e-Ø-kub'	b'iyoo-n	t-e	jel	b'alam
DET	CLF	man	COM-B2/3S-DIR	kill-AP	A2/3S-RN:PAT	CLF	jaguar

'It was the man who killed the jaguar'

Here again it is important to contrast the difference in syntactic configuration between focus, currently under discussion, and topic, described just above. Focus position involves an argument being extracted to the left periphery, while topic does not: as such, while intransitive subjects and transitive objects may extract, transitive agents require an antipassive.

(216) Focusing of a transitive agent triggers antipassive

a. (intransitive S)

Ja	xin	xjaal	n-Ø-b'eet
DET	CLF	man	COM-B2/3S-walk

'It's the man who's walking'

b.

Ja	jel	b'alam	e-Ø-kub'	t-b'iyo-'n	jel	b'alam	(transitive O)
DET	CLF	jaguar	COM-B2/3S-DIR	A2/3S-kill-DS	CLF	man	

'It was the jaguar the man killed'

c.

Ja	xin	xjaal	e-Ø-kub'	b'iyoo-n	t-e	jel	b'alam	(transitive A)
DET	CLF	man	COM-B2/3S-DIR	kill-AP	A2/3S-RN:PAT	CLF	jaguar	

'It was the man that killed the jaguar'

A secondary way of focusing just the subject (either transitive or intransitive) without movement to the left periphery is through a type of low or *in situ* focus involving the genitive/possessive relational noun *e*. In this construction, which is also described for SJA Mam by Scott (2023). Here, any subjects which would trigger LP marking take it on the relational noun instead of, for instance, on the verb. Take the contrast in (217) below as an exemplar.

(217) *In situ* subject focus in Todos Santos Mam

a.

ma	tz-uul=i	t-e	Sqach Qko'ya?	(no subj. focus)
PROX	B2/3S-arrive.here=LP	A2/3S-RN:PAT	Sqach Qko'ya	

'Did you come for *Sqach Qko'ya* (the Todos Santos November 1st horse race)?'

b.

ma	tz-uul	t-e=y	t-e	(sub. focus)
PROX	B2/3S-arrive.here	A2/3S-RN=LP	A2/3S-RN:PAT	

Sqach Qko'ya?
Sqach Qko'ya?
'Did *you* come for *Sqach Qko'ya*?'

This relational noun paradigm for *in situ* subject focus does not continue throughout the entire paradigm: it is noticibly (and as of now unexplainably) absent from the third person singular, where it is simply replaced with a classifier pronoun.

(218)

ma	tz-uul	q'a/*t-e	t-u'j	fiesta?
PROX	B2/3S-arrive.here	CLF/*A2/3S=RN:GEN	A2/3S-RN:in	SP:party

'Did *he* come for the party?'

For more on the syntax and semantics of topic and focus constructions, see Aissen (1992).

6.4 Relative clauses

Todos Santos Mam has a number of relative clause types, discussed in Elkins & Brown (submitted). Headed relative clauses are characterized by the preposing movement of some nominal phrase (219).

(219) Ma tz-uul [xin xjaal]$_i$ [$_{RC}$ ma tz'-ok n-pju-'n ____$_i$]
PROX B2/3S-arrive.here CLF man PROX B2/3S-DIR A1S-hit-DS
'The man I hit arrived'

If the relativized phrase is indefinite (that is, a relativizing complementizer *aj* follows that phrase in the beginning of the subordinate clause; the use of *aj* necessitates the demonstrative proclitic *j=* to introduce the clause as well (220).

(220) Ø-Ø-xi' n-q'olb'e-'n jun xjaal j=[aj x-Ø-kub'
CØM-B2/3S-DIR A1S-greet-DS INDF man DEM=C.REL DIST-B2/3S-DIR

b'iyoo-n t-e jel b'alam]
kill-AP A2/3S-RN:PAT CLF jaguar
'I greeted a man who killed the jaguar'

While all RCs are post-nominal, the nominal+RC may occur *in situ* (221a), but speakers most often front it to pre-verbal (focus) position position (221b).

(221) In situ and focused RCs

a. ma tz-uul xin xjaal [Ø-Ø-ok pjuu-n=t-e
PROX B2/3S-arrive.here CLF man CØM-B2/3S-DIR hit-AP=A2/3S-RN:PAT

naya]
1SG.PRO
'The man who hit me arrived'

b. ja xin xjaal [Ø-Ø-ok pjuu-n=t-e na'ya]
DET CLF man CØM-B2/3S-DIR hit-AP=A2/3S-RN:PAT 1SG.PRON

ma tz-uul
PROX A2/3S-arrive.here
'It was the man who hit me who arrived'

Relative clauses present another corner of the grammar where we can examine ergative extraction effects. The head of an RC is assumed to overtly move to pre-verbal (focus) position; if that nominal is the subject of a transitive verb, it may not head its RC unless the verb within the RC is an antipassive, as the sentences contrasted below demonstrate.

(222) Extraction out of RC

a.

ja	xin	xjaal	ma	tz'-ok	pjuu-n**=t-e**	na'ya	ma	tz-uul
DEM	CLF	man	PROX	B2/3S-DIR	hit-AP=PREP	me	PROX	B2/3S-arrive

'The man who hit me arrived'

b.

*ja	xin	xjaal	ma	tz'-ok	t-pju-'n	na'ya	ma	tz-uul
DEM	CLF	man	PROX	A2/3S-DIR	A2/3S-hit-DS	me	PROX	B2/3S-arrive

Intended meaning: The man who hit me arrived'

Todos Santos Mam also employs various types of free relative clauses, a topic explored in detail in Elkins & Brown (forthcoming). In maximal free relative clauses (Max-FRs), a *wh*-expression may alternate with either Ø, or, interestingly, simply the demonstrative *j=* (223). In existential free relative clauses (Ext-FRs), an existential such as *at* is used with a *wh*-expression to create a declarative sentence expressing the existence of an entity (224). Lastly, there are free choice free relatives (FC-FRs), declarative sentences which involve a *wh*-expression suffixed with an enclitic such as *=xa* 'FC', roughly equivalent to the English suffix *-ever* (225).

(223)

Ø-Ø-ok	n-che'ya	{al/Ø/j=}	e-Ø-tz	laq'oo-n	t-e	k'um]
CØM-B2/3S-DIR	A1S-SEE.DS	who/Ø/DEM=	COM-B2/3S-DIR	buy-AP	A2/3S-RN:PAT	güicoy

'I saw (the one) who bought the güicoy'

(224)

at	ja	[k-w'-el=ix	n-maq'u-'n	n-chmaan=a	]
EXIST	where	B2/3S-DIR-POT=DIR	A1S-bury-DS	A1S-grandfather=LP	

'There's somewhere I will bury my grandfather'

(225)

k-w'-el	n-b'iyo-'n	alchee=xa	jel	txi'yaan	t-e=y
B2/3S-DIR=POT	A1S-kill-DS	which=FC	CLF	dog	B2/3S-RN:GEN=LP

ma	Ø-jaw	t-sk'o-'n
PROX	B2/3S-DIR	A2/3S-choose-DS

'I'll kill whichever dog you choose'

7 Summary

This section presented an overview of major topics in Todos Santos Mam grammar. §2 discussed phonology: consonant and vowel inventories, phonological processes, and incipient tone. §3, on "words and phrases" discussed noun phrases, verb phrases, positionals, and relational nouns. §4 discussed clause structure (word order, alignment, and voice/valence). §5 on "complex structures", discussed the scale of embeddings, from most to least finite, and split ergativity. Lastly, §6 treated with extraction syntax and questions.

I hope here to have provided readers a general background on Mam that will be useful for the succeeding chapters, as well as providing a description of modern colloquial Todos Santos Mam, which was last documented thoroughly by Una Canger over fifty years ago (Canger 1969). Despite the length of this sketch, most topics were not discussed in all their complexity. Also, as this chapter roughly follows the outline in England (2017) and Scott (2023), we may more easily understand typological differences between several Northern Mam varieti

CHAPTER 3

Syntactic diagnostics of verb-initiality in Mam

1 Introduction

The content of this dissertation begins with the following question: what is the syntactic constituency of Mam's VSO word order? This dissertation will address this question from two angles: one is purely syntactic (Chapter 3, here), and one is prosodic (Chapter 4). From the syntactic side, much evidence converges on the fact that *verb raising*, rather than some other path to VSO, is correct for Mam. The purpose of this chapter is to discuss the syntactic evidence for verb raising in Mam, as opposed to the other possible paths to VSO, as given in Clemens (2021).

First, in §2 I show that a VP remnant raising account is not viable for Mam. Evidence comes five major arguments, showing that a phrasal movement account encounters numerous problems which are avoided by positing just verb raising.

(1) Criteria invoked to disprove VP remnant raising

a. Mirroring of Mam's suffixes to the nodes on the clausal spine (§2.1);
b. The variable position of directionals (§2.2);
c. VP-ellipsis (§2.3);
d. The position of adjuncts (§2.4); and
e. Negation (§2.5)

Second, in §3 I present four different diagnostics that cast doubt on a right-spec syntax for Mam. These tests come directly from recent work by Little (2020b) on the Mayan language Ch'ol.

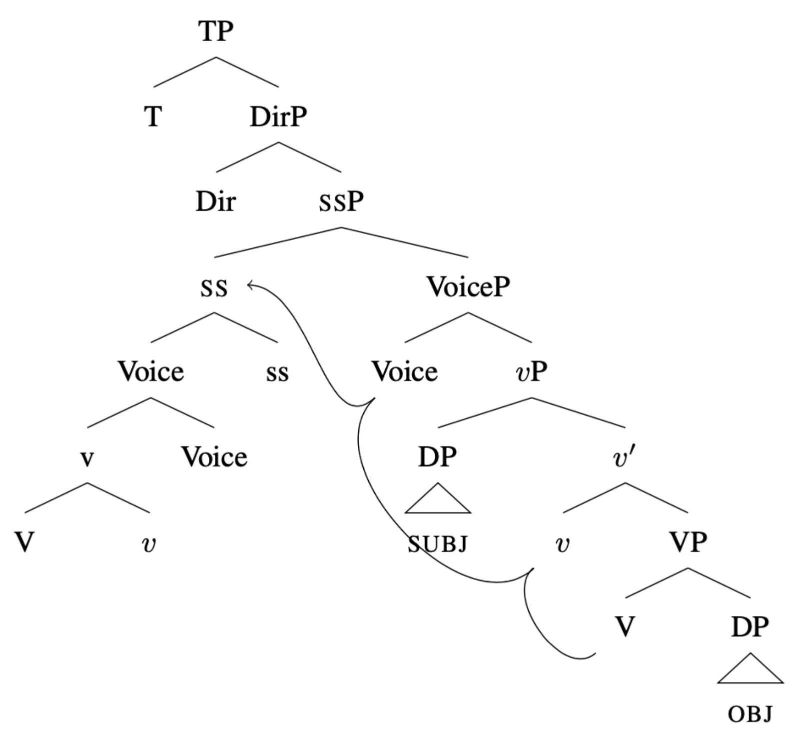
(2) Criteria invoked to disprove right-spec syntax

a. Binding: objects may not bind into subjects (§3.1);
b. Scope: objects need not have specific, definite interpretations (§3.2);
c. Definiteness: objects are not always definite (§3.3); and
d. Subextraction: absolutive objects do not solely show subextraction islandhood (§3.4)

Indeed, there is much converging evidence not only from the syntax (and also from the prosody – see Chapter 4 to follow), that Mam derives its VSO word order through verb raising. Additionally, Mam's ban on the extraction of transitive subjects, usually argued to arise from the raising and intervention of the object, can be reconciled with a purely verb raising account by invoking of *lower-copy spellout* (e.g. Brodkin 2023), whereby a the lower copy of a movement chain is phonologically realized despite having a higher copy produced through some syntactic mechanism (e.g. Bošković & Nunes 2007, Corver & Nunes 2007).

This chapter, therefore, ultimately adopts the following structure for the Mam clausal spine, given in (3). We see that the verb alone rolls up through verbal functional heads, landing ultimately in a position hierarchically superior to the subject, which for the purposes of cross-Mayan comparison, I label as the head of the status suffix phrase (SSP). Above SSP, and therefore above the typical landing site of the verb is the projection that introduces the directionals, which itself is immediately dominated by TP, which introduces aspectual morphemes.

(3) Mam clausal spine, showing verb-movement through $\textsc{ss}^0$

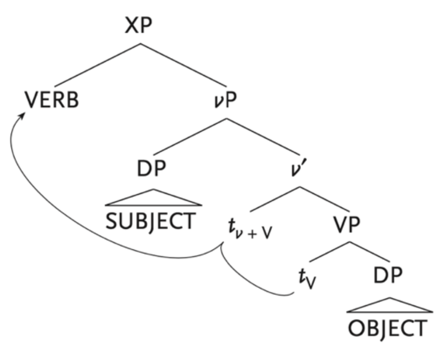


2 Syntactic evidence in favor of verb-raising

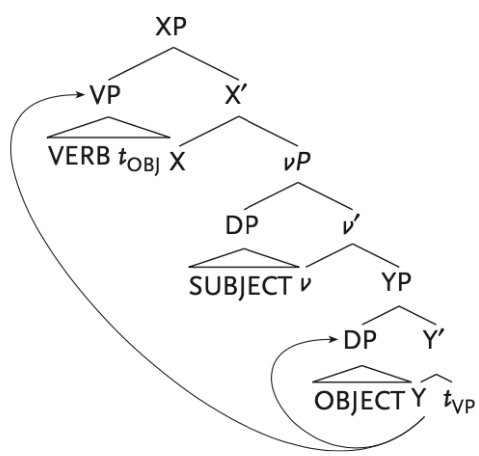
In this section, I outline various arguments for adopting verb raising, instead of VP remnant raising, as Mam's path to VSO. Recall that the two structures which we will be discussing may be schematized as below in (4). Under a verb-raising account (4a), the verb raises alone from the VP to some higher head. Under a predicate remnant raising account (4b), the entire verb phrase (or some larger XP) fronts to the specifier of some higher phrase; the object must first evacuate to some position above the VP in order to derive VSO word order.

(4) Paths to VSO: verb-raising *vs.* predicate remnant raising (Clemens 2021)

a. Verb-raising syntax



b. Predicate remnant raising syntax



The criteria that I will invoke to argue in favor of verb-raising in Mam, as opposed to predicate remnant raising, are repeated in (5).

(5) Criteria invoked to disprove VP remnant raising

a. Mirroring of Mam's suffixes to the nodes on the clausal spine (§2.1);
b. The variable position of directionals (§2.2);
c. VP-ellipsis (§2.3);
d. The position of adjuncts (§2.4); and
e. Negation (§2.5)

2.1 The mirroring of suffixes to Mam's clausal spine

The first piece of evidence in favor verb raising, rather than VP remnant raising, in Mam comes from the order of morphemes in the Mam verb stem. Specifically, the order of morphemes is consistent with the Mirror Principle (Baker 1985): the order of Mam suffixes is the exact reverse ("mirroring") of the order of the heads which realize them along the Mam clausal spine. That is to say, the order of morphemes within the stem reflects the order of their syntactic derivation.

Mam verb stems involve a number of elements. The first is the verb root, which may take a number of *v*P-level suffixes, such as causativizers. Linearly succeeding *v*P-level suffixes are VoiceP-level suffixes, such as the transitivity suffixes *-'n* 'DS' and *-n* 'AP', the applicative voice susffix *-b'a*, or the passive morpheme (e.g. *-eet*). Lastly, the local person enclitic *=i* comes in final position within the verb stem. (6) below gives a schematization of a complex verb with all these elements represented.

(6) ma Ø-b'aj t-lok-cha-'n=i
PROX B2/3S-DIR A2/3S-be.wet.POS-CAUS-DS=LP
'You wet it (the fabric)'

The linearization of heads in Mam can accounted for under a verb-raising account of VSO. On the other hand, the linearization of heads is more difficult to reconcile if we adopt a VP remnant raising account of VSO in Mam, which we will return to below. Argumentation on this front largely follows arguments laid out in previous work on the Mayan language Ch'ol (Clemens & Coon 2018, Little 2020). First, we must assume that the verb needs to accumulate its range of voice suffixes. Above in (6), we see that the verb takes causitive and transitivity marking. Following much work on pan-Mayan syntactic structure (and following the proposal in Coon 2017a, Clemens & Coon 2018), we can say that the causative morpheme, which in Mayan languages always occurs directly following the verb stem, is realized by a head v^0 (this head is also responsible for a wide range of properties, such as introducing certain subjects, realizing agreement with transitive subjects, and raising the object above the subject). The transitivity suffix (either the directional suffix *-'n* or the antipassive suffix *-n*) is exponed on an immediately higher head, which we can call Voice^0. Evidence that the transitivity suffix is on Voice^0 (instead of, say, SS^0) is that it exists in complementary distribution with other voice suffixes, which are also assumed to be on Voice^0, such as the passive. Compare the verb *tscheel* 'to grind (nixtamal)' in sentences (7a) and (7b); in (7a), the verb bears the directional suffix *-'n*, tracking transitive valence; in (7b), this suffix is entirely replaced with the passive *-eet*, which marks the verb out as intransitive (refer to Chapter 2, §4.3.2) for more information about passives in Todos Santos Mam).

(7) Passive suffix in Mam

a.

t-u'j	tiem	o	Ø-b'aj	Ø-Ø-e=x	n-tche**-'n**
A2/3S-RN/in	year	COM	B2/3S-finish	CØM-B2/3S-DIR=DIR	A1S-grind**-DS**

b'uch'
nixtamal
'Last year I ground the nixtamal'

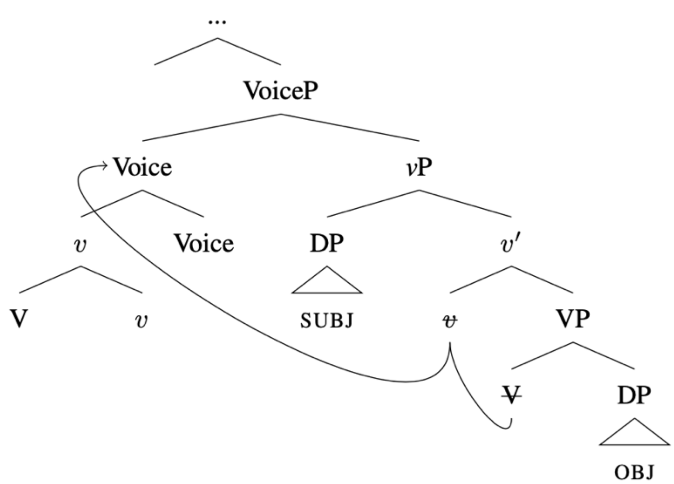
b.

Lu=ta	b'uch'	ya	ma	tz'-e=x	tsch**-eet**
LU=AFF	nixtamal	already	PROX	B2/3S-DIR=DIR	grind**-PASS**

'The nixtamal is indeed already ground'

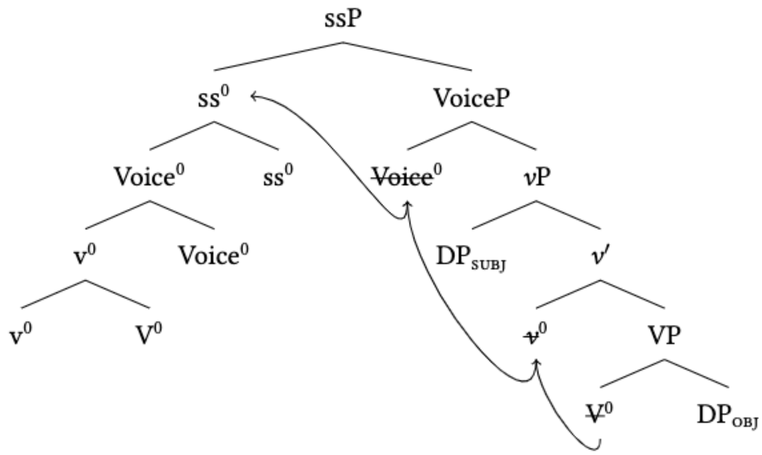
Therefore, the verb must head-move in order to accumulate its necessary range of possible suffixes. That is, it must move at least from V^0 through v^0 and Voice^0. This movement of the verb through Voice^0 is schematized below in (8).

(8) Verb movement through Voice^0



Following this first chain of movement, the verb must additionally find its way in initial position, that is, before the subject DP. In Mayanist literature, this position is taken to be the projection SS^0, the head of the status suffix phrase SSP. This projection is posited to exist because in other Mayan languages, the final position within the verb stem is the transitivity-tracking status suffix; in order to gain the full range of verbal suffixes, the verb must move at least as high as SS^0. Mam notably lacks the dedicated status suffix position seen in other Mayan languages, instead realizing its transitivity-tracking suffixes lower than would be expected (in v^0, as argued for just above). However, following recent work on the Mam verb (Scott 2020b, 2023), which is in turn informed by Clemens & Coon's (2018) account of the pan-Mayan verb stem, I assume that the projection SSP is still present within the structure, but it simply serves as the final landing site of the verb in a typical declarative clause. The label "SSP" is therefore something of a misnomer for Mam, but is taken up here in order to be consistent with the terms already used in the literature. The schematization in (9) below shows verb movement through SS^0.

(9) Verb movement through SS^0



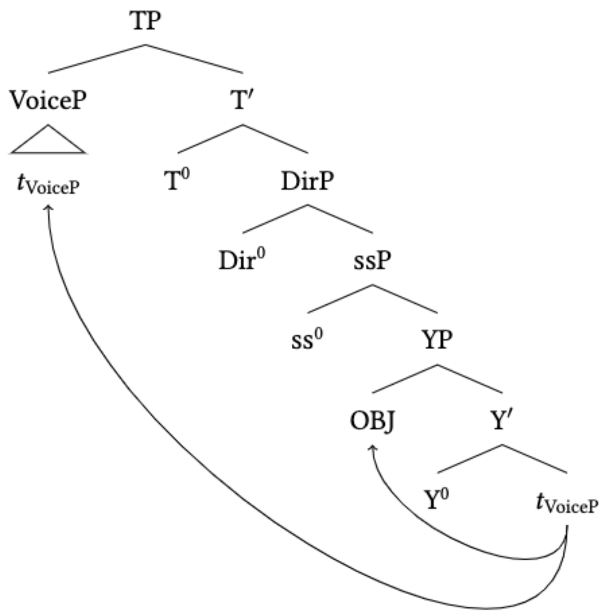
With the understanding reached above, we can now consider how the correct order of elements along the clausal spine cannot be generated correctly under a VP remnant raising account of VSO. Under an account of predicate raising in Mayan first proposed by Coon (2010), the VP (or VP remnant) is moved to Spec,TP to derive verb-initial word order. If this phrasal movement were to occur, then we would incorrectly predict a number of characteristics of Mam morpheme order within the clause.

First, if the VP remnant were in Spec,TP, it would linearize *before* aspect marking. This would lead to the incorrect morpheme order as in (10), derived by the hypothetical operation as in (11). If a larger constituent moves, say, *v*P, then the subject DP situated in Spec,*v*P would additionally be linearized before aspect marking. Independent movement of the subject as well, which would evacuate it from the constituent that moves, is not warranted.

(10) Incorrect morpheme order if VP remnant raising occurs

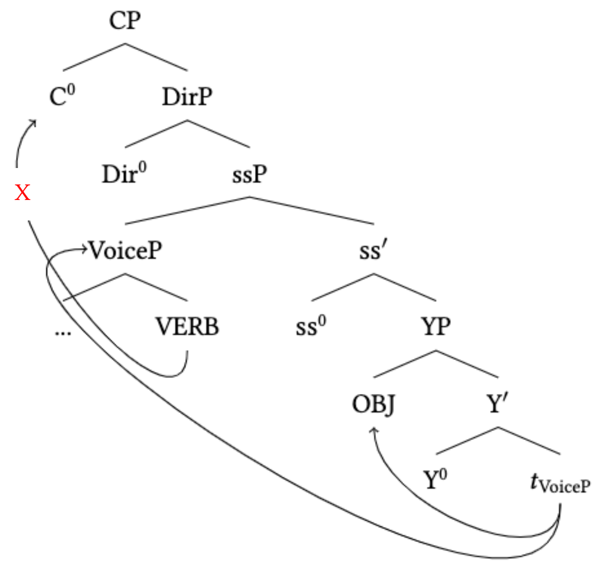
*verb –TAM – dir – subject – object

(11) Predicate remnant movement would linearize verb+subject before T⁰/aspect marking



We could try to rectify the issue of the pre-aspect landing side of the verb by proposing that the phrasal remnant moves to some lower position, for example Spec,SSP (Coon 2010b briefly mentions this possibility but does not work it through; see also van Urk 2022 on the SVO language Imere). At first glance, this seems to solve the problem of linearization, although it raises an additional problem. As we will see in much more detail in §2.2, sometimes the verb must pass through additional heads (the ones which express directional information, i.e. Dir^0); we see this in constructions such as the transitive imperative construction and clauses in the incompletive aspect. Following the Freezing Principle (Ross 1975; Wexler & Culicover 1977), it should not be possible, under an account of VP remnant movement to Spec,SSP, for the verb to escape the raised VP and continue head-moving. This illegal movement is diagrammed below in (12).

(12) Illicit movement of the verb out of the predicate remnant



In sum, phrasal movement of the VP (or larger phrasal constituents) are irreconcilable with Mam's morpheme order. Therefore, only an account which assumes verb-raising is able to account for the Mam facts.

We may contrast this finding with a verb-initial language which has been argued to derive its word order through predicate (remnant) movement: Me'phaa (also called Tlapanec; Oto-Manguean, Mexico; Duncan 2017). In Me'phaa, morphemes such as the causative and passive, which must appear in a structural position above the verb, appear pre-verbally (not post-verbally, as is the case in Mayan). This absence of mirroring indicates that verb-movement has not taken place, and that these pre-verbal morphemes are pronounced in their base-generated positions.

(13) Absense of mirrorring in the Me'phaa causative (Duncan 2017, p. 131)

a. Ni-t-**ro-**thón
PFV-2SG-**CAUS-**cut
'You cut it'

b. *Ni-t(a)-thón-ro
PFV-2SG-cut-CAUS
Intended: 'You cut it'

This finding lays the groundwork for additional diagnostics showing Mam word order as being derived through verb raising, not VP remnant raising, which are given in the rest of this section.

2.2 The variable position of directionals

We saw above that Mam's directional auxiliaries usually occupy a pre-verbal position, at least in declarative clauses. This is in contrast to most other Mayan languages, which either lack directionals entirely, or have mostly or exclusively post-verbal directionals. In Mam, multiple directionals can occur together (forming a "complex directional"); when this occurs, the two or three directionals are never pronounced as separate prosodic words, but rather as a single unit with phonological reduction on some or all of the directional morphemes. We also find that within a complex directional, the elements are always ordered with respect to each other: the deictic-oriented directional always comes before the ground/egocentric-oriented directional, which in turn always comes before *b'aj*. In the following example, *kub'* 'down' is a simplex deictic-oriented directional: when it co-occurs with the simplex ground-oriented directional *xi'* 'away from subject', it always appears as *ku'=x* 'down and away from subject.' We can say, then, that complex directionals are composed of two or more directional heads which always share the same hierarchical relationship.

(14) Order of directionals

a.

e-∅-**kub'**	t-b'iyo-'n	xin	xjaal	jel	b'alam	*kub'*
COM-B2/3S-DIR	A2/3S-kill-DS	CLF	man	CLF	jaguar	

'The man killed the jaguar'

b.

ma	**∅-ku'=x**	t-awa-'n	Juan	kjo'n		*kub' + xi'*
PROX	B2/3S-DIR=DIR	A2/3S-plant-DS	Juan	corn		

'Juan planted corn'

c.

ma	**∅-ku'=x=b'aj**	n-awa-'n	kjo'n		*kub' + xi' + b'aj*
prox	B2/3S-DIR=DIR=DIR	A1S-plant-DS	corn		

'I finished planting the corn'

Having pre-verbal directionals is sometimes not possisble, but only in a few special syntactic contexts. The first is the transitive imperative, which was first described in England (1983) as involving suffixal/enclitic directionals (refer to Chapter 2, §3.4.2). To form the imperative, the verb takes the directional(s) in suffix/enclitic position. Thus, they appear to the right of the verb, which may also bear the transitive imperative suffix *-n*/*-m*.

An contrast below in (15) demonstrates this variable positioning of the directional(s). Interestingly, when an imperative takes a complex directional, the two elements which comprise that complex directional appear in the same linear order as they would have if they were in default position. In (15a), we see the verb *awal* 'to plant' being modified by the ocmplex directional *ku'=x* (derived from *kub'* + *xi'*). In (15b), we see that the complex final directional *=k'a=x* (which is derived from the final, phonologically reduced allomorphs of the same pair of directionals), also appears with *kub'* preceding *xi'*.

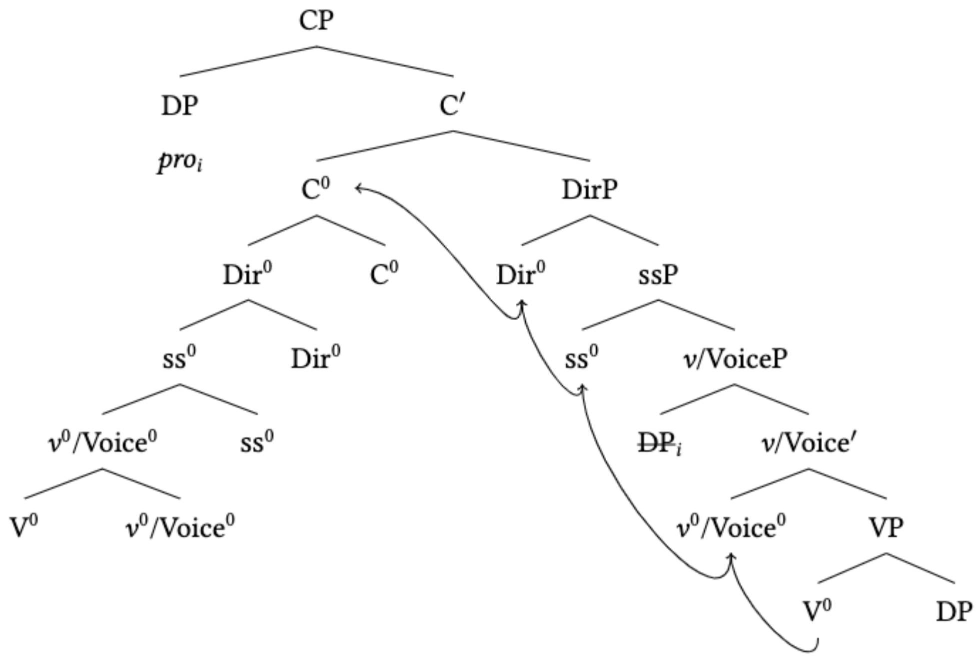
(15) Post-verbal directionals in the transitive imperative (*kub'* + *xi'*)

a. Ma **Ø-ku'=x** t-awa-'n Juan kjo'n
PROX B2/3S-DIR=DIR A2/3S-plant-DS Juan corn
'Juan planted corn'

b. Ø-Ø-awa-n**=k'a=x** kjo'n!
B2/3S-A2/3S-plant-IMP=DIR=DIR corn
'Plant corn!'

The imperative is widely understood to be an extremely high position in the clause: specifically, the verb in many languages head-moves to C^0 within a full CP structure (Beukema & Coopmans 1989, Zanuttini 1991, Henry 1995, Potsdam 1996, Platzack and Rosengren 1997, Rupp 2002, Alcázar & Saltarelli 2014). Therefore, we can understand the unusual position of the directionals as occurring because the verb head-moves through Dir^0 on its way to C^0, in order to check the [IMPERATIVE] feature on the C^0 head. Without such a feature, the verb remains low in its otherwise final landing position, SS^0. Moving high in the imperative has the side effect of accumulating the directional(s) in a position following the verbal stem.

(16) Movement to C^0 of an imperative verb



This information in hand, we can take post-verbal directionals to be an indication of unusually high verb movement *above* SSP, particularly to the C-domain. Keeping this point in mind, there is another construction which arguably also involves unusually high verb movement, namely the *lu*-progressive construction.

Todos Santos Mam has a grammaticalized progressive construction which utilizes the element *lu* (see Chapter 2, §3.2.4). In progressives, *lu* pre-verbally and takes a DP complement, as seen in (17). This DP complement raises from some position in the clause; we can tell that movement is involved because of the EEC being active: a transitive subject moving to be a *lu*-progressive subject triggers an antipassive, just as if it were focused, relativized, or *wh*-questioned (17 below shows additionally that *lu*-movement may trigger the antipassive). Note also that the *lu*-progressive appears most often with a verb in the incompletive aspect *n-*, as the action described in the progressive construction is currently ongoing at utterance time.

(17)	lu	xin	xjaal	n-Ø-b'iyoo-n	t-i'j	jel	b'alam
	LU	CLF	man	INC-B2/3S-kill-AP	A2/3S-RN:OBL	CLF	jaguaar

‘The man is killing the jaguar’

In example (18a) below, the directional which typically co-occurs with the verb *xjool* 'to kick' is *ok* (motion in), which can be seen in its typical pre-verbal position. In (18b), the same verb is placed within a *lu*-progressive. Here, the directional *ok* appears following the verb stem as its word-final allomorph =*k*.

(18) Suffixal directional in the *lu*-progressive

a. Ja q'a ku'waal **∅-ok** xjoo-n t-e pelot e-∅-xke'
DEM CLF child B2/3S-**DIR** kick-AP A2/3S-RN:PAT ball COM-B2/3S-win
'The boy who kicked the ball won (the game)'

b. lu q'a ku'waal n-∅-xjoo-n**=k** t-e pelot t-u'j
LU CLF child INC-B2/3S-kick-AP**=DIR** A2/3S-RN:PAT ball A2/3S-RN/IN

b'e'
road
'The boy is kicking the ball in the road'

As with the case of the transitive imperative, we see that in the *lu*-progressive, it is also possible for complex directionals to appear following the verb. To take another example, the verb *jkool* 'to open (a door)' may take the complex directional derived from *ok* (motion in) and *tzaj* (motion towards subject) when the actor of the sentence opens the door from the outside. The verb accrues post-verbal directionals in the *lu*-progressive (19a), just as in the transitive imperative verb (19b). In both cases, the stem-final combination of *ok* + *tzaj* is realized as the reduced =*k*=*tz*.

(19) Suffixal complex directionals in both *lu*-progressive and imperative

a. lu Juan n-∅-jkoo-n**=k=tz** pwert
LU Juan INC-B2/3S-open-AP=DIR=DIR door
Juan is opening the door'

b. ∅-∅-jko-n=**k=tz** pwert!
B2/3S-A2/3S-open-IMP=DIR=DIR door
'Open the door!'

While a full analysis of the *lu*-progressive is beyond the scope of this chapter, we can entertain two hypotheses as to why the verb accrues post-verbal directionals in the *lu*-progressive specifically. It should be noted that the *lu*-progressive constitutes just one construction in which the incompletive aspect *n-* is used in Todos Santos Mam. Other uses of the incompletive include habituals and duratives. In neither of these do we see evidence of a verb raised higher than would be expected of a typical declarative (20).

(20) Uses of the incompletive aspect: habitual and durative

a. Qa xuj txu'yb'aj **n-**Ø-xi' ch-q'o-'n xuj qa ne'
PL CLF mother **INC-**B2/3S-DIR A2/3S-give-DS CLF PL baby

taa-l *las siete*
sleep-INF at 7:00
'The mothers put the babies to bed at 7:00'

b. **n-**qa awaa-n semilla ooxa ora
INC-B1P plant-AP seed three hour
'We plant seeds for three hours (each day)'

Above in (14a) the verb in the habitual may not have post-verbal directional – as such, a verb form such as **n-ch-q'o-'n=x.* for 'they (the mothers) are giving' is not allowed. We may therefore say that the *lu*-progressive construction, like the imperative construction, correlates with post-verbal directionals.

It is also important to note that in varieties of Mam without the grammaticalized *lu*-progressive, a form that looks essentially identical to one of the forms above in (20) is used. There, since there is no fronting of any constituent to be the complement of *lu*, we do not see the concomittant post-verbal directional. An example of the progressive in Ixtahuacán Mam (England 1983b) shows such a case. (This is also seen in San Juan Atitán Mam; Scott 2023).

(21) n-Ø-xi' t-k'a-'n=tl txuub'aj txqan=tl a'
INC-B2/3S-DIR A2/3S-drink-DS=other mother a.lot=other water
'The mother was again drinking some more water'
(Ixtahuacán Mam; England 1983b, p. 310)

This is all to say that without *lu*-progressive-driven movement (which appears unique to Todos Santos Mam), the particularly high position of the verb is not a feature of the progressive construction.

The first potential reason for why verbs move higher in the *lu*-progressive compared to other incompletive clauses is discussed in Elkins (2023). There, I argue that *lu* and its complement form a focused DP that raises to the C-domain (specifically Spec,FocP, but the exact position doesn't matter for the present purpose); this is also assumed to be the landing site of other focused elements. The focus phrase would be headed by C^0/Foc^0 which carries some feature attracting the verb to move to it, which would allow for essentially the same kind of roll-up movement of the verb that we see in imperatives also moving to the C-domain. This analysis would explain why we see post-verbal directionals specifically in the *lu*-progressive and imperatives.

Another reason for why the *lu*-progressive functions as it does is that it's possible that *lu* is not actually a demonstrative, but is instead a stative predicate, with a more accurate translation being 'being here now.' This would account for the fact that it only takes DP complements (a feature of statives in Mam and elsewhere). It additionally would answer why *lu* takes the same pronouns as other (known) stative predicates. Specifically, we see that the 1ps pronoun is *qen* following statives and *na'ya* as a transitive object; the relational noun *w-e'=ya* is also often used in subject position as a pronoun ('I') – the three forms of the subject do not overlap in distribution. We see in (22) examples of nominal-derived and an adjectival-derived stative predicates; compare how, in (23), we also see *qen* as the subject of a *lu*-progressive construction.

(22) First person singular subject of stative predicates is *qen*

a. alaq' **qen**
thief 1PS.STAT.PRON
'I am a thief'

b. siktnin **qen**
tired 1PS.STAT.PRON
'I am tired'

(23) lu **qen** n-chin ta-n txal-ch
LU 1PS.STAT.PRON INC-B1S sleep-AP on.one's.side-POS
'I'm sleeping on my side'

We can therefore alternatively propose that the subject in a *lu*-progressive construction raises out of some subordinate clause to land as the complement to the stative predicate *lu*. It is possible that this subordinate clause is of a different clause type than other typical declarative clauses, perhaps bearing a unique flavor of T^0 which seeks a verb to check some feature. This unique flavor of T^0 may be characteristic of all incompletive clauses as a class, since preliminary evidence shows that incompletive verbs in a variety of Ā-movement constructions raise and take post-verbal directionals. Below, we see examples of this for *wh*-questions (24a) and focus (24b).

(24) Post-verbal directionals in a variety of incompletive constructions

a. al n-Ø-pjuu-n=**k** Miguel?
WHO INC-B2/3S-hit-AP=**DIR** Miguel
'Who is Miguel hitting?'

b. Ja q'a ku'waal n-Ø-xjoo-n=**k** t-i'j pelot
DEM CLF child INC-kick-AP=**DIR** A2/3S-RN:OBL ball
'It's the boy who is kicking the ball'

Regardless of the correct analysis of the *lu*-progressive, we see that specifically in those situations where the verb is somehow expected to move higher than SSP, we also see post-verbal directionals. This serves as straightforward evidence that verb-movement is occurring, and not phrasal movement of some larger constituent. An alternative account of VSO, such as predicate remnant raising, cannot account for the directional facts, as the directional occupies a position that would be too high to be included in whatever constituent ultimately fronts to clause-initial position. It would also make it difficult to square with the fact that suffixal directionals also occur in the imperative construction.

2.3 Verb phrase ellipsis

The third piece of evidence which argues against an account of VP remnant raising comes from the domain of ellipsis. In Celtic and Semitic languages, verb phrase ellipsis (VPE) has been used as a diagnostic of verb-raising (e.g. McCloskey 1991, 2005; Goldberg 2005). Specifically, VPE can be shown to have unique behavior in languages that exhibit verb-raising compared to languages which lack it. The following example comes from a dialogue from Irish (Celtic), and shows that VPE does not target the verb, instead eliding all post-verbal structure.

(25) Irish VPE (McCloskey 2005, p. 157)

a. Sciob an cat an t-eireaball de-n luch
snatched the cat the tail from-the mouse
'The cat snatched the tail off the mouse'

b. A-r sciob?
Q-PST snatched
'Did it?' (lit. 'Snatched?')

c. Creidim gu-r sciob
Believe.1SG COMP-PST snatched
'I believe it did' (lit. 'I believe snatched')

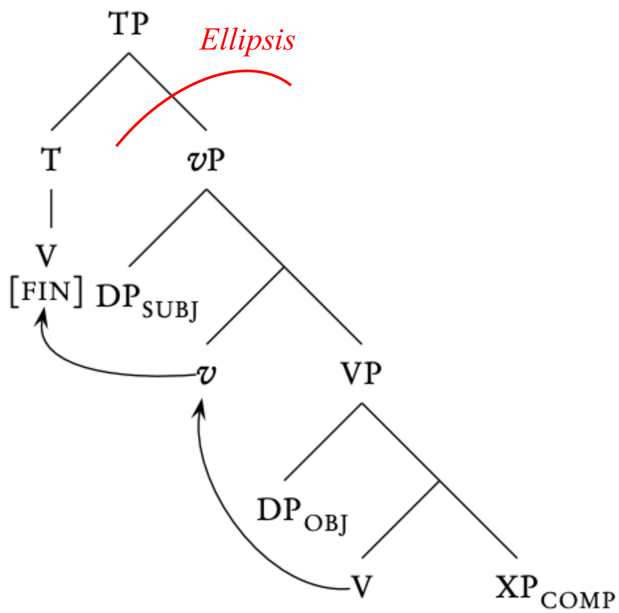
In McCloskey's (1991, 2005) analysis, the verb survives VPE in Irish because it has moved to a position outside of the syntactic constituent which is ultimately elided. In a language like English, whose process of VPE has the same interpretive properties as that of Irish, the verb does not survive because it does not move. More specifically, the VP pro-form *do* is required. The following example shows an example of VPE in English (26a) with the elided structure crossed out in (26b).

(26) VPE in English: no verb movement, so it elides (Merhcant 2001)

a. Mary bought a book, and John did too.
b. Mary bought a book, and John did ~~buy a book~~ too.

We can see this schematized in the tree below in (27), modified from McCloskey (2017), that the verb moves to a position outside of the extended verbal domain *v*P to a landing site, here T^0, above the eventual ellipsis site (the verb will continue to move through higher heads, eventually ending up as the head of the high polarity phrase ΣP). The ellipsis domain is notated by a red line.

(27) Ellipsis of *v*P following verb movement in Irish VSO (modified from McCloskey 2017)



To compare the case of Irish to that of Mam, we can look at the following dialogue. Just as in Irish, the verb (and any pre-verbal material such as the aspect/directional complex) survives ellipsis.

(28) Mam VPE

a.

x-Ø-kub’	t-b’iyo-’n	Juan	jel	t-wixh	Pedro
DIST-B2/3S-DIR	A2/3S-kill-DS	Juan	CLF	A2/3S-cat	Pedro

‘Juan killed Pedro’s cat’

b.

x-Ø-kub’=ma	t-b’iyo-’n?
DIST-B2/3S-DIR=Q	A2/3S-kill-DS

‘Did he?’ (lit. ‘Killed?’)

c.

n-tzqi’n	x-Ø-kub’	t-b’iyo-’n
A1S-know	DIST-B2/3S-DIR	A2/3S-kill-DS

‘I know he did’ (lit. ‘I know he killed’)

We also see VPE in sentences with conjoined clauses, where the verb survives in the second conjunct.

(29)

s'-etz	t-laq'o-'n	Pedro	kaab'a	libro,	w-u'ya=x
DIST+B2/3S-DIR	A2/3S-buy-DS	Pedro	two	book	A1S-RN:CONJ=ENCL

w-e'=ya	s'-etz	n-laq'o-'n	[____]
A1S-RN=LP	DIST+B2/3S-DIR	A1S-buy-DS	

'Pedro bought two books, and so did I'

This ellipsis behavior is in contrast to that seen in VP remnant raising languages like Me'phaa (Duncan 2017). Duncan shows that verbs are never stranded during ellipsis. We see this, for example, in the following two sentences, where the verb is deleted in the second conjunct.

(30) Me'phaa VP ellipsis (Duncan 2017, p. 140)

a.

Ne-tse	María	ajma	iye	gajm-áa	ikhúún	**mang-ún**
PFV-3SG.BUY	María	two.INAN	book	and-3SG	1SG	also-1SG

'María bought two books and I did too'

b.

Arturo	**ni-'kha**	**jayá**	mbá	rí	ni-xnúun	María
Arturo	PFV-3SG.come	bring	INDEF.INAN	REL.INAN	PFV-give.3SG	María

gajm-áa	Juliéta	**mang-á**
and-3SG	Julieta	ALSO-3SG

'Arturo brought a gift to María and Julieta did too'

Mam actually has two sites for VPE, leading to two potential ellipsis structures. I will argue here that the two different sites vary as to the size of the elided element, which falls out from there being two distinct sites. We can call the one which elides the smaller amount of material "small VPE" and the one which elides more material "large VPE."

Small VPE is what we saw above in (28) and (29), where everything following the verb deletes. Large VPE, however, is also possible: here, we see that everything following the *directional* deletes, including the verb.

(31) Small *vs.* Large VPE in Mam

a.

x-Ø-kub’	t-b’iyo-’n	Juan	jel	t-wixh	Pedro
DIST-B2/3S-DIR	A2/3S-kill-DS	Juan	CLF	A2/3S-cat	Pedro

‘Juan killed Pedro’s cat’ — Baseline

b.

x-Ø-kub’=ma	t-b’iyo-’n?
DIST-B2/3S-DIR=Q	A2/3S-kill-DS

‘Did he?’ (lit. ‘Killed?’) — Small VPE

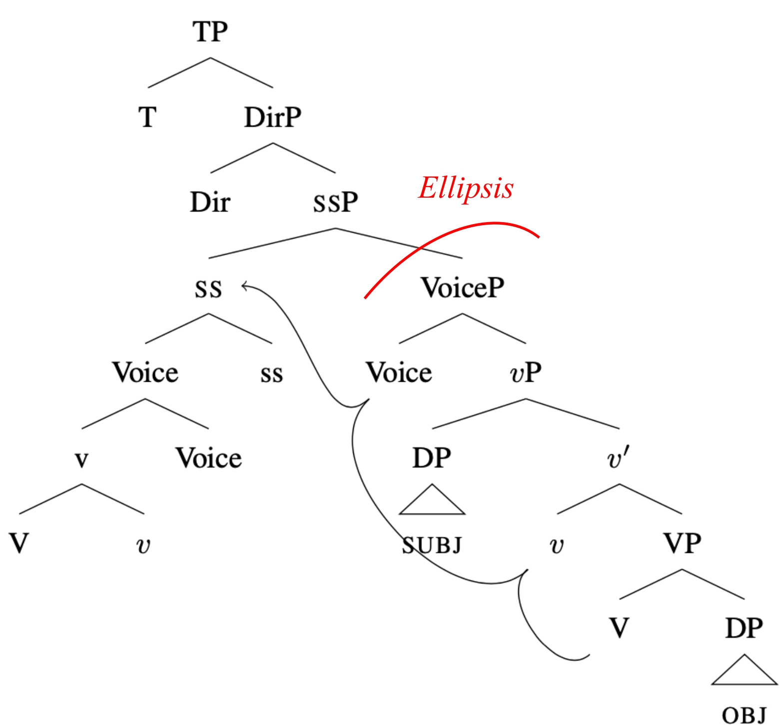
c. x-Ø-kub’=ma?
DIST-B2/3S-DIR=Q
‘Did he?’ (lit. ~ ‘Did it happen?’) — Large VPE

The precise translation of the Large VPE sentence in (31c) is somewhat difficult, since there is no verb, but only the directional complex. A speaker comments that “Did it happen?” is the best English translation available to him. We see here that the two VPE structures clearly implicate two different loci of ellipsis.

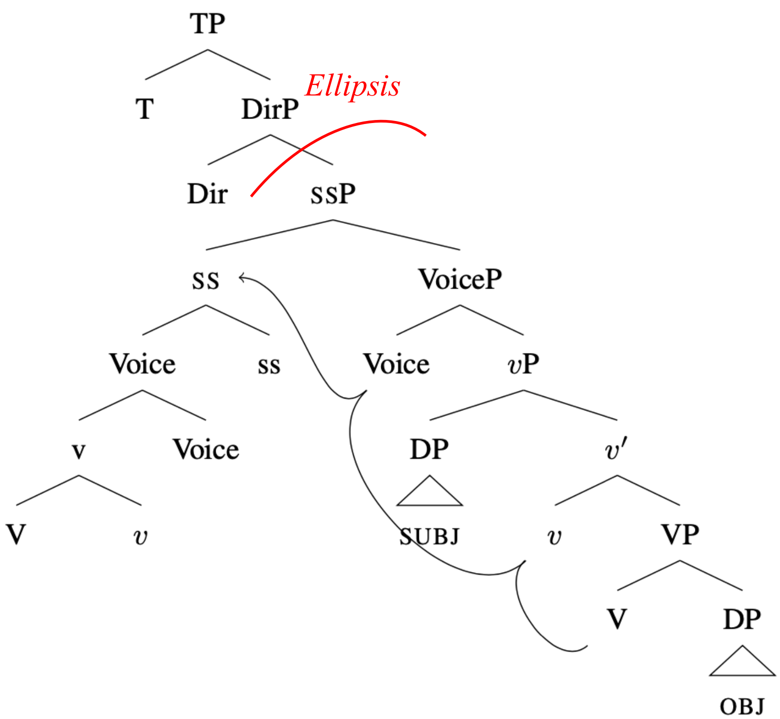
In Small VPE, where everything below the verb is elided, we can claim that the ellipsis domain is the complement of SS^0, this head being the ultimate landing site of the verb (32a). In Large VPE, the entire constituent under the node SSP elides (i.e. the compliment of Dir^0) (32b).

(32) Small and large VPE in Mam

a. Small VPE



b. Large VPE



Crucially, we see that Mam's Small VPE results in the verb's surviving ellipsis, which is expressly predicted by a verb-raising account which puts the final landing site of the verb above the ellipsis site. A different prediction would be made if Mam employed predicate remnant raising; if this were the case, we would expect, for example, that the verb should be ellided in the second conjunct in a conjoined clause. As a consequence, we should *only* expect to see Large VPE as a possible elliptical sentence, which is not the case. Duncan (2017) proposes that languages for which VPE is not verb-stranding, like Me'phaa, involve the verb (phrase) not raising to a sufficiently high position to escape ellipsis. A VP remnant raising account for Mam (or across Mayan) would indeed involve the VP remnant moving to this high position (assumed to be Spec,TP as discussed earlier; Coon 2010b), but this would additionally interact with the morpheme-ordering problem discussed in §2.1. Additionally, I cannot find independent motivation for some lower landing site for the VP remnant (for example, Spec,SSP) which might alleviate this morpheme-ordering problem.

2.4 The position of adjuncts

Next, we can consider argumentation from the linearization of adjuncts within the clause, specifically adverbs. The literature on word order takes considerable interest in the position of adverbs with respect to other constituents, as this can be taken as a diagnostic for their relative syntactic positions.

Mam has a number of different types of adverbs, each with their own linearization properties. A similar scenario is discussed for another VSO language, Santiago Laxopa Zapotec (SLZ), by Adler et al. (2018): they propose that there are distinct classes of adverb with their own unique structural positions. According to that proposal, there are, perhaps among others, (i) temporal adverbs (e.g. *yesterday*, *tomorrow*), manner adverbs (e.g. *slowly*, *loudly*), and aspectual adverbs (e.g. *still*, *just*). In SLZ, each type of adverb has distinct distributional properties, which is argued to fall out from their respective positions in the syntactic structure. Based on the evidence from adverbs, as well as a handful of additional, language-specific metrics, Adler et al. (2018) follow Lee (1999, 2006) in concluding that Zapotec languages derive their VSO word order through VP remnant raising.

In Todos Santos Mam, we may similarly apply the adverb metric. An additional benefit of this metric is that it can be directly compared to, and contrasted with, the analogous facts in a VSO language like SLZ that undergoes VP remnant raising. In Mam, we find that temporal, manner, and aspectual adverbs also exhibit unique linearization behavior.

We look first at temporal adverbs, using as an example the word *ewa* 'yesterday.' Temporal adverbs like *ewa* may only occur clause-initially and clause-finally in Mam. If a temporal adverb appears between the directional complex and the verb, the verb and the subject, or the subject and the object, the sentence is deemed degraded. I take this to mean that temporal adverbs adjoin to CP (further evidence for this claim is advanced below).

(33)	**{ewa}**	e-tz'-ok	**{*ewa}**	t-pju-'n	**{*ewa}**	txin	María
	yesterday	COM-B2/3S-DIR	**yesterday**	A2/3S-HIT-DS	**yesterday**	CLF	María

	{*ewa}	xin	xjaal	**{ewa}**
	yesterday	CLF	man	**yesterday**

'María hit the man yesterday'

Take, on the other hand, the position of manner adverbs such as *cheeb'a* 'slowly.' In the following sentence, we see that manner adverbs in Mam may also appear in clause-initial or -final position, but they may additionally appear between the subject and the object. All other positions are ruled out.

(34) **{cheeb'a}** e-Ø-kub' t-qeesa **{*cheeb'a}** María **{cheeb'a}**
slowly COM-B2/3S-DIR A2/3S-cut.DS **slowly** María **slowly**

is **{cheeb'a}**
potato **slowly**
'María cut the potato slowly'

I take the above data from manner adverbs to indicate that manner adverbs have the option of adjoining to VP. They my also, like temporal adverbs, occupy a slot in the C-domain. Unlike temporal adverbs, however, clause-peripheral manner adverbs do not *adjoin* to CP, but actually *occupy* Spec,CP. Evidence for manner adverbs' positioning in Spec,CP comes from when there is an additional *wh*-expression present in the clause, which also must occupy Spec,CP in Mam. In (35) below, we see that the temporal adverb *ewa* 'yesterday' can co-occur with the *wh*-expression *alchee t-b'eel waab'j* 'which type/flavor of food.' This behavior can be contrasted with the manner adverb *cheeb'a* 'slowly' in (36) which may not co-occur with the same *wh*-expression.

(35) **{ewa}** alchee t-b'eel waab'j e-Ø-ku'=x t-b'in-cha-'n
yesterday which A2/3S-flavor food COM-B2/3S-DIR=DIR A2/3S-do-CAUS-DS

María **{ewa}**?
María **yesterday**
'Which type of food did María make yesterday?'

(36) **{*cheeb'a}** alchee t-b'eel waab'j e-Ø-ku'=x t-b'in-cha-'n
slowly which A2/3S-flavor food COM-B2/3S-DIR=DIR A2/3S-make-CAUS-DS

María **{cheeb'a}**?
María **slowly**
'Which type of food did María make slowly?'

We may therefore propose that temporal adverbs adjoin to CP, and that manner adverbs *have the opportunity* to occupy Spec,CP: doing so is akin to focus-fronting, which, like *wh*-

questioning, brings some element to Spec,CP. The "default" position of manner adverbs, however, is as adjunct to VP, which we can see if the adjunct remains between the subject and object (34).

Lastly, we may consider the distribution of aspectual adverbs in Todos Santos Mam, which have a unique distribution with respect to the other two types of adverb discussed above. Firstly, it is important to note that most of what could be characterized as "aspectual adverbs" in Mam are in fact not formally adverbs, but instead are predicative, and act to embed non-finite complement clauses. Thee adverbs are: (i) always clause-initial, like verbs; and (ii) trigger super-extended ergativity. For example, take *naa=x* 'not yet' or *xina* 'almost.' Super-extended ergativity on the verb is marked in bold in (37) (refer also to Chapter 2, §5.2 for super-extended ergativity).

(37) Predicative "aspectual adverbs"

a.

naa=x	**t-**uul	u'jb'il
not.yet=ENCL	**A2/3S-**arrive.here	notebook

'The notebook hasn't arrived yet'

b.

xina	**t-**uul	q'iij
almost	**A2/3S-**arrive.here	sun

'The sun is almost out (lit. 'almost arrives here')'

There are, however, a handful of aspectual adverbials which do not pattern like those above, e.g. *jun=tl maj* 'again' (lit. 'another time').[6] These may occur in any position except for immediately post-verbally, mirroring the distribution of manner adverbs (compare the distribution of *cheeb'a* in (34)). Like for those, we can claim that aspectual adverbs may adjoin to VP.

(38)

{jun=tl.maj}	ma	Ø-tzaj	t-tzuyu-'n	**{*jun=tl.maj}**	xin	xjaal
again	PROX	B2/3S-DIR	A2/3S-grab-DS	**again**	CLF	man

{jun=tl.maj}	jel	txi'yaan	**{jun=tl.maj}**
again	CLF	dog	**again**

'The man grabbed the dog again'

[6] This adverb is composed of *jun=tl* 'one=again' and *maj* 'time, instance.' Though compositionally transparent, it is judged by speakers to be a single word, which is why I have decided to gloss it simply as 'again.'

We may also say that these aspectual adverbs may occupy Spec,CP, just like manner adverbs can. We see below that *jun=tl maj* 'again' may not occur in its pre-verbal position if there is a *wh*-expression already occupying Spec,CP.

(39)

{*jun=tl maj}	Al	ma	Ø-tzaj	tzuyu-'n	t-e	jel
again	who	PROX	B2/3S-DIR	grab-AP	a2/3s-rn:pat	clf

txi'yaan	**{jun=tl maj}**?
dog	**again**

'Who grabbed the dog again?'

Do aspectual adverbs simply adjoin to VP, or do they adjoin *within* a (recursive) VP? Tenny (2000) proposes that because aspectual adverbs are sensitive to the internal structure of the verbal event, they must adjoin closer to the verb than other adverb types. In English, we see this restriction illustrated by the ungrammatical forms in (40b, d) where the temporal adverb *today* adjoins high, and the aspectual adverb *still* adjoins low.

(40) English: aspectual adverbs join closer to the verb than tempeoral ones (Tenny 2000)

a. **Today** Max is taking the bar exam.
b. *Max is **today** taking the bar exam.

c. Max is **still** taking the bar exam.
d. ***Still** Max is taking the bar exam.

Therefore, in order to keep course with typological generalizations, we may claim that the "default" position of aspectual modifiers like *jun=tl maj* within VP, but may optionally be fronted to Spec,CP. (Whether these adverbs are within or outside of the VP is actually not crucial to the analysis at hand.) A summary of the positions of all three adverb types discusssed here is given below in (41).

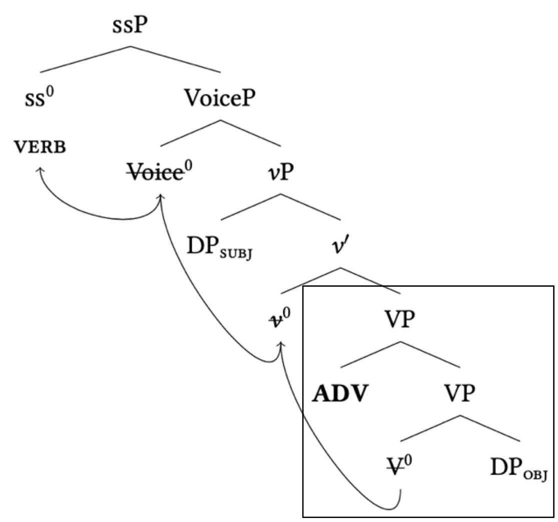
(41) Summary of the positions of adverbs in Todos Santos Mam

a. Temporal adverbs always adjoin to CP.
b. Manner adverbs adjoin to VP but may be fronted to Spec,CP.
c. Aspectual adverbs adjoin within VP, but may be fronted to Spec,CP; some are additionally predicates embedding non-finite complements.

How do these results help inform a verb-raising account of VSO? Any kind of VP remnant raising account of VSO faces the challenge of accounting for manner and aspectual adverbs. First, if manner adverbs are adjunct to VP, this means that they should be able to appear preceding the verb if they are within the constituent that raises. This would look like the manner adverb appearing between the directional and the verb. However, this is not seen: no adverb *of any kind* may occur in the position between the directional and the verb. Secondly, if aspectual adverbs are within VP, they should also be able to occur in this position, but they do not.

In contrast, however, if we assume a verb-raising account of VSO, the "stranding" of VP-level adverbs is much more readily explainable. We should – and indeed do – see that although the verb moves (alone) to clause-initial position, manner and aspectual adverbs remain low within the VP that now no longer contains just the verb.

(42) Adverbs adjoined to VP stranded after verb movement



2.5 Negation

Finally, we can examine one more piece of evidence that Mam's verb-initiality is not derived via phrasal movement: negation. In a seminal account of predicate remnant raising in the VSO language San Lucas Quiaviní Zapotec, Lee (SLQZ; 1999, 2006) shows that the initial verb is negated with the same negator elements which serve to negate other XPs, indicating that the verb is actually phrasal, being housed within a VP remnant. SLQZ has a number of negative elements; the one which typically serves to modify a verb (the "clausal negator") is *cë'ity*. However, when a verb is contrastively focused, the negator *a'ti'* is used instead.

(43) SLQZ clausal negation with *cë'ity* (Lee 2006, p. 57)

Cë'ity	ny-àa'izy-dya'	Gye'eihlly	Li'eb
NEG	SUBJ-beat-DYA'	Mike	Felipe

'Mike didn't hit Felipe'

(44) SLQZ contrastively focused verb with *a'ti'* (Lee 2006, p. 57)

A'ti'	gw-à'izy-dya'	Gye'eihlly	Li'eb,	b-cuhni'-ëng	Li'eb
NEG	PERF-hit-DYA'	Mike	Felipe	PERF-kick-3S.PROX	Felipe

'Mike didn't *hit* Felipe, he *kicked* Felipe'

The negator *a'ti'* is problematic for a verb-raising approach to VSO in SLQZ because this is precisely the negator that is used to negate other phrasal elements, such as DPs and PPs.

(45) SLQZ *a'ti'* negates XPs (Lee 2006, p. 58)

a.

A'ti'	[DP Sann Luu'c]-dya'	gw-èeh	Pa'amm
NEG	San Lucas-DYA'	PERF-go	Pam

'Pam didn't go to *San Lucas* (but rather somewhere else)'

b.

A'ti'	[PP cuann	tenedoor]-dya'	b-da'uw	Gye'eihlly	gueht
NEG	with	fork-DYA'	PERF-eat	Mike	tortilla

'Mike didn't eat tortillas with a fork'

The idea that phrasal material comes between the negator *a'ti'* and the element *-dya'* (proposed by Lee to be the head of NegP) raises an issue for the verb-movement account. If head-movement of the verb occurred alone, we should not expect to see phrasal elements negated with *-dya'* in negation contexts. Because we do, it is much more parsimonious to assume that the initial verbs are also phrasal, thus accounting for their distribution under negation. That is to say, we should expect that elements of the same category should be negated the same way, implying that initial verbs really constitute VP remnants in SLQZ.

A similar diagnostic may also be applied to Mam. We see that Mam's typical verbal/clausal negator is *mii'n*. This is also used when the verb is contrastively focused.

(46) Verbal/clausal negation with *mii'n*

mii'n	e-Ø-tz	n-lamo-'n	t-lameel	ja'
NEG	COM-B2/3S-DIR	A1S-closes-DS	A2/3S-lid	house

'I didn't close the door'

(47) Contrastive focus negation with *mii'n*

mii'n	Ø-Ø-xi'	b'eet	Harold	t-u'j	tnum,
NEG	CØM-B2/3S-DIR	walk	Harold	A2/3S-RN/in	town

Ø-Ø-xi'	ajqala!
CØM-B2/3S-DIR	run

'Harold didn't walk to the town, he ran!'

The negator *nya*, on the other hand, is used to negate verbs/clauses that are in the incompletive aspect or are stative.

(48)

nya	n-chin	b'eet
NEG	INC-B1S	walk

'I'm not walking (right now)' Incompletive aspect negation

(49)

nya	alaq'	t-e=y
NEG	thief	A2/3S-RN=LP

'You are not a thief' Stative negation

Phrasal elements, such as DPs, are negated with *nti'(=x)* if non-human or *n'aal(=x)* if human. This morpheme seems to be identical to the negative existential predicate (i.e. the negative counterpart of *at* 'EXIST'), indicating that XPs that are negated are technically existential free relative clauses.

(50)

nti'=x	dulce	n-Ø-xi'	ch-wa-'n	qa	ne'
NEG.EXIST=ENCL	candy	INC-B2/3S-DIR	A2/3P-eat-DS	PL	young.child

'The children aren't eating any candy' (lit. 'there is no candy that the children are eating')

(51) n'aal=x ne' n-∅-waa-n dulce
NEG.EXIST=ENCL child INC-B2/3S-eat-AP candy
'No child is eating candy' (lit. 'there is no child that is eating candy')

From the above data, it appears as though verbs and XPs are negated with entirely distinct negation morphology and/or morphosyntactic construction. This is the opposite of what Lee (1999, 2006) proposes for SLQZ, where verbs in contrastive focus are negated the same way as XPs are (when not contrastively focued). Of the negator *nya*, we can say that this negative element surfaces in non-finite contexts, regardless of whether the verb is underlyingly verbal or a derived non-verbal predicate (both contexts involve non-finite clauses in Mam). In sum, we find that negation can be used as an additional metric to argue against a predicate remnant raising account of Mam's VSO.

2.6 Local summary

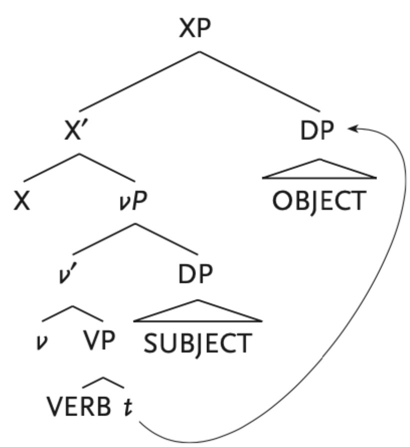
To summarize this section, I presented evidence from a number of domains to show that predicate remnant raising as an account of Mam's VSO leads to a number of irreconcilable problems, which are all avoided by adopting a verb-raising account of VSO instead. Evidence came from the following areas: (i) the order of morphemes in a complex verb; (ii) the variable position of directionals; (iii) verb phrase ellipsis; (iv) the linearization of adverbs; and (v) differential negation strategies for verbs and XPs.

The following section continues our investigation into clausal architecture in Todos Santos Mam, with the aim to show that right-spec syntax is also untenable for the language, based on a number of new criteria, gathered from discussions in previous literature.

3 Syntactic evidence against right-side specifiers

In this section, I continue to apply diagnostic tests on Mam clause structure. While in the last section, I showed evidence for verb-initiality that are more consistent with verb-raising rather than predicate remnant raising, in this section, I present evidence against an account of Mam's word order which would comport with right-side specifiers ("right-spec") syntax. Recall that a right-spec syntactic derivation of VSO may be schematized as in (52), following Clemens (2021). Here, we see that phrases within the verbal domain are parameterized non-antisymmetrically such that their specifiers are oriented rightward. This by default generates VOS word order; to achieve VSO word order, the object must extrapose to a position above the subject. Right-spec syntax has been proposed for Mayan languages with VOS word order (for Ch'ol by Little 2020, and for Kaqchikel by Otaki et al. 2019), and has been recently adopted for San Juan Atitán Mam by Scott & Sales 2021, Scott 2023).

(52) VSO word order through right-spec with object postposing (Clemens 2021)



Right-spec syntax does not inherently mean that the verb remains low. In a right-spec structure, the verb is already initial in the clause; however, if it remains unraised, it would be unable to accure its appropriate morphology, such as voice and status. What is shown in (52) above is a way to account for VSO languages by positing that the object overtly moves rightward, with the assumption that the verb, regardless of whether or how high it moves, will continue to be initial because of the left-branching head structure.

The diagnostics I will apply here to test for right-spec syntax/object movement were set forth by Little (2020b), whose case study was the Mayan language Ch'ol. Throughout her investigation, she showed that there is consistent evidence that absolutive objects are high in Ch'ol, and uses these facts to argue for a right-spec syntactic structure. Specifically, the tests aim to understand structural and interpretational differences between an object that is expected to be in a position above the subject or some quantifier, and an object which remains low in the structure. Here, we see whether or not the diagnostics used in Ch'ol can be applied successfully to Mam.

(53) Predictions for high objects following (overt) movement (Little 2020b)

a. binding: objects are predicted to bind into subjects;
b. scope: objects are predicted to scope over (material in) subjects;
c. definiteness: objects are predicted to always be definite; and
d. subextraction: objects are predicted to be islands for subextraction

The overarching conclusion of this section is that Mam's absolutive objects do not pattern like those of Ch'ol, that is to say that the above diagnostics are unsuccessful in accounting for the various structural and interpretational properties of absolutive objects (as compared to, e.g. antipasive objects or subjects). Although absolutive objects do have certain interpretational differences compared to antipassive objects (which are argued to always remain low and unmoved) it is not clear that this or any of the other diagnostics is able to show definitively that Mam objects are overtly high. In fact, the interpretational differences just mentioned are the reverse of what would be expected, given the facts from Ch'ol. If these tests have been performed correctly, they provide evidence that a right-spec account of Mam's VSO is syntactically untenable.

3.1 Evidence from binding

The first diagnostic for object raising comes from the domain of binding. Object inversion/movement above the subject (shorthand: O>S) should induce a relationship between the two such that the object will asymmetrically c-command, and be able to bind into, the subject or material in the subject (Reinhart 1983). Two main predictions follow from this approach. First, as a result of O>S inversion, an R-expression object should be able to bind into an anaphor subject even though the linear order of the two phrases is still subject>object, given VSO word order. Second, an object should be able to bind a variable in the subject.

A handful of other languges have been argued to evidence these features by means of O>S inversion, including not only the Mayan language Ch'ol (Little 2020), but also the Austronesian language Mandar (Brodkin 2021). To take as a first example the case of Mandar, Brodkin (2021) demonstrates that the absolutive argument asymetrically c-commands all other verbal arguments (this is despite linear word order: see Brodkin 2023). This can be made sense of if the absolutive argument moves to a structurally higher position in the clause. Therefore, an R-expression in an external argument may not be co-indexed with a pronoun internal argument. In (54) below, the external argument contains two R-expressions – 'Nina and Kaco''s mother' – and may not bind into the anaphor in the internal argument; otherwise, it would result in a violation of Binding Condition C.

(54) Mandar absolutive induces Condition C violation over ergative (Brodkin 2021, p. 24)

Na-ita=i	[INT *pro*$_{*i,j}$]	[EXT kindo'-na	**iNina$_i$**	anna'	iKaco']
3ERG-see=3ABS	her	mom-3GEN	Nina	and	Kaco'

'Nina$_i$ and Kaco''s mom saw her $_{*i,j}$'

Likewise, an absolutive argument that is quantified, e.g. with the universal quantifier *=nasang* 'every', may bind into the subject.

(55) Mandar quantifier in absolutive binds variable in external argument FIX

a.

Na-salili**=nasang$_i$**=i	kindo-**na$_i$**	sanaeke$_i$
3ERG-miss=every=3ABS	mom-3GEN	child

'Her$_i$ mother misses every$_i$ child'

b.

Na-allai**=nasang$_i$**=i	guru-**nna$_i$**	passikola$_i$
3ERG-scold=every=3ABS	teacher-3GEN	student

'His$_i$ teacher scolded every$_i$ student'

It is therefore clear that object movement can feed binding relationships. With that information in hand, we may look at another language more closely related to Mam, which has also been proposed to show these object inversion effects. In Ch'ol, Little (2020b) finds evidence from binding that parallels that in Mandar. Little takes this as one of many reasons to argue that

Ch'ol objects raise (overtly) over subjects. A sentence demonstrating this phenomenon is given below, with the assumed movement trace.

(56) Ch'ol object binding into subject (Little 2020b)

Ta' i-xul-u ____$_i$ [i$_i$-yum]$_S$ [ixä machity]$_{Oi}$
PFV A3S-break-TV A3S-owner that machete
'Its$_i$ owner broke [that machete]$_i$.'

Little (2020b, fn. 11) notes a potential confound with this sentence, in that the order of subject-object is the same for a possessee-possessor relationship. That is to say, this sentence could plausibly (also) mean 'That machete's owner broke (something).' Little also notes that this analysis allows for a quantifier (such as *every*) to be able to bind into a variable in the object (see also Clemens & Polinsky 2017, p. 24), but leaves the matter untested.

We see that in Mam this test does not yield the expected results if we assume (overt) object raising in a right-spec syntactic structure. We find in a variety of sentence types that the kind of binding relationships expected on Little's or Brodkin's account are unavailable. For example, if the object is an R-expression (here, a proper name), it may not be interpreted as binding an anaphor in subject position (57). In order to render the intended meaning, the object must solely consist of the bound pronoun, and the subject must contain the R-expression (58).

(57) *e-∅-tzaj t-xq'e-'n [t-$_i$txu' txin]$_S$ [María$_i$]$_O$
COM-B2/3S-DIR A2/3S-hug-DS A2/3S-mother CLF María
Intended: 'María$_i$'s mother hugged her$_i$'
Possible as: 'María's mother hugged (somebody)'[7]

(58) e-∅-tzaj t-xq'e-'n [t-$_i$txu' María]$_S$ [ja txin$_i$]$_O$
com-b2/3s-dir a2/3s-hug-ds a2/3s-mother María dem clf.f
'María$_i$'s mother hugged her$_i$.'

The fact that objects cannot bind into material in their subjects has actually been noted before for a number of other Mayan languages, not just high-abs like Mam, but also low-abs (e.g. Craig 1977 on Popti'; Aissen 1997, 1999 on Tsotsil; Curiel 2007 on Tojol-ab'al; Pascual 2007 on Q'anjob'al; Zavala 2007 on Akatek and Ch'ol; Polian 2013 on Tseltal; Pérez Vail 2014 on Cajolá

[7] This interpretation is only possible if what are labelled in (57) as "subject" and "object" are actually parsed as a single subject in a possessor-possessee relationship between María's mother and María.

Mam). Aissen (1997, 1999) and Zavala (2007, 2017) try to account for this (near-)universal restriction on objects binding into subjects by invoking a constraint akin to *obviation*, where the subject is more proximate and the object is more obviative. This has implications for choice of voice morphology in various clausal contexts across the family. As far as it concerns the present data, the fact that the (perhaps more proximate) subject contains the anaphor, whereas the (perhaps more obviative) object contains the R-expression, is ruled out *a priori* on obviation grounds, and cannot tell us much about binding specifically (see also Royer 2022 for discussion of how obviation may relate to a binding puzzle in Chuj and Ch'ol).

The addition of a quantifier (here, the universal quantifier *enterra=x* 'every') confirms that object as binder is impossible. We might expect a sentence such as in (59) to have the interpretation that the owner broke every machete he owned; instead, this sentence is ungrammatical. To render the intended meaning, the subject phrase including *machet* 'machete'must bind into the quantifier *enterra=x* in object position, as shown in (56).

(59)	*ma	Ø-kub'	t-oo'ka	[xin	t-$_i$awa]$_S$	[enterra=x$_i$	machet]$_O$
	PROX	B2/3S-DIR	A2/3S-break.DS	CLF	A2/3S-owner	every=ENCL	machete

Intended: 'Its$_i$ owner broke every$_i$ machete'

(60)	ma	Ø-kub'	t-oo'ka	[xin	t-$_i$awa	machet]$_S$
	PROX	B2/3S-DIR	A2/3S-break-DS	CLF	A3/3S-owner	machete

[enterra=x$_i$	machet]$_O$
every=ENCL	machete

'The machetes' owner$_i$ broke every one of them$_i$'

These two failed diagnostic tests from the domain of binding confirm that the object may not bind into the subject in Mam. This is unexpected if we were to assume that Mam's clause structure was similar to that of Mandar or Ch'ol, with high objects whose movement feeds their ability to bind into material in the subject. The tentative conclusion thus far is that objects do not raise – or if they do, that movement does not feed binding.

3.2 Evidence from definiteness

The next piece of evidence which may be brought to bear on the question of object raising comes from definiteness. In Mayan languages with VOS/VSO-alternating word order, the configuration of subject with respect to object is contingent on the definiteness of the object (see England 1991, p. 454): if it is definite, VSO word order appears; if it is indefinite, VOS emerges instead. We see this, in, e.g. Ch'ol (Little 2020b among many others). This is often taken to be evidence that VOS objects, being indefinite or structurally reduced in some way (e.g. just a bare NP instead of DP) undergo pseudo-incorporation with the verb (e.g. Clemens 2014 *et seq.* on Ch'ol and Niuean), which may only occur if the object is non-specific/indefinite. On the other hand, VSO objects are argued to undergo definiteness-based object shift, akin to that documented widely in Germanic languages (Diesing 1992, *et seq.*).

A prediction made by Little (2020b) for Ch'ol, a VOS/VSO-alternating language, is that shifted VSO objects should consistently receive a specific, definite interpretation. Conversely, objects in VOS position will be non-specific and/or indefinite by default. It is initially not entirely clear how such an account can be extended to Mayan languages which have rigidly fixed a VSO word order such as Mam or Q'anjob'al. Recall that in the assumed derivation from Proto-Mayan's VOS/VSO-alternating word order, languages in the geographically contiguous Mamean and Q'anjob'alan languages generalized the more marked VSO word order that arose whenever the object was definite, animate, etc. (Norman & Campbell 1978, England 1991, Aissen 1992). As such, this innovated, generalized fixed-VSO word order should not necessarily be assumed to consistently assign definite or specific interpretations to their objects, as there is now no definiteness (etc.) alternation between VOS and VSO objects.

Let us look at the Mam facts specifically. Mam does not have a definite article: England (1983b, p. 151) reports that (bare) noun phrases in Mam are automatically interpreted as definite, as if there were a null definite article.[8] Mam does have an indefinite article, *jun* 'INDF', which is homophonous with the numeral *jun* 'one'.[9] Then again, it has been reported for other languages

[8] "There is no definite article in Mam. The indefinite article alone marks a noun phrase as indefinite; its absence implies definiteness[.]" (England 1983b, p. 151).

[9] The homophony between the numeral 'one' and the indefinite article actually raises the question if so-called "indefinite" DPs are not actually definite numerical expressions, e.g. NumP.

that overt markers of definiteness need not just be articles; for example, Royer (2019) argues that the presence of a classifier (and by extension, numeral), may mark a DP as definite.

Per Little (2020b), right-spec syntax with object raising correlates with the object receiving a specific, definite interpretation. We see that in Ch'ol, where word order alternates between VOS and VSO, that VSO order (with an assumed extraposed object) arises whenever the object is a definite DP. Mam, being fixed-VSO, should always be expected to raise its object if a right-spec syntax is assumed. From a diachronic standpoint, it should also be the case that if Mamean and Q'anjob'alan languages regularized VSO word order, absolutive objects should always be expected to have this interpretation. As a direct consequence of this, we might expect that a VSO object may never be marked by the indefinite article *jun* 'INDF', or that non-specific indefinites are impossible in transitive object position. Neither of these predictions is borne out.[10]

First, we can see that indefinite DPs, modified with *jun*, are possible as VSO objects. Bare, definitely-interpreted DPs are also possible in this position.

(61) Indefinite DPs licit in object position

a.

k-w-e'l	t-tz'ib'=i	**jun**	u'jb'il
B2/3S-DIR-POT	A2/3S-write.DS=LP	INDF	book

'You will write **a** book' — Indefinite DP

b.

k-w-e'l	t-tz'ib'=i	u'jb'il
B2/3S-DIR-POT	A2/3S-write.DS=LP	book

'You will write **the** book' — Definite DP

Second, we may observe that non-specific indefinites are also possible in VSO object position. In fact, Mam allows specific and non-specific indefinites to be transitive objects.

(62) Sepcific and non-specific indefinite transitive objects

a.

e-w-il	**jun=l**	**waakxh**	t-u'j	potrel
COM-A1S-see	INDF=CLF	cow	A2/3S-RN/in	field

'I saw a cow in the field' — Specific indef.

b.

w-aj	tz'-ok	n-che'ya	**(jun)**	**waakxh**	jun	q'iij
A1S-want	B2/3S-DIR	A1S-see.DS	INDF	cow	INDF	day

'I want to see a cow someday' — Non-specific indef.

[10] Munro (p.c.) reports that these predictions are not borne out in Q'anjob'al either, indicating that this may generalize across rigidly VSO languages in Mamean and Q'anjob'alan families.

We therefore see that for Mam, being a fixed-VSO language, that the definiteness test cannot be applied successfully.[11] We can claim, then, that Mam (and perhaps other fixed-VSO Mayan languages) do not have definiteness-based object shift.

3.3 Eviences from interpretation (scope)

The interpretation of the absolutive object is another good diagnostic for the relative movement of O>S. For Ch'ol, Little (2020b) proposes that in contexts where the object is inverted above the subject, the object receives a particular (wider) scopal interpretation with respect to adverbs above which it has moved; unmoved objects, on the other hand, take narrow scope in parallel contexts. Before a review of the relevant facts in Ch'ol, we may also look cross-linguistically, at other languages which have been argued to have O>S inversion and the relevant consequences for the interpretation of the object.

Recent work by Yuan (2021) provides a case study of such an effect in the Inuit dialect continuum of the North American Arctic and Greenland. Much of her work has established that although Inuit languages are almost invariably ergative-absolutive, different Inuit languages vary subtly with respect to how ergativity is realized. Specifically, languages vary with regard to whether absolutive agreement is genuine ϕ-agreement (e.g. in Kalaallisut) or whether it is a case of clitic doubling of the absolutive with a ϕ-bearing D^0 head (e.g. in Inuktitut). Yuan argues that this difference has consequences for the interpretation of absolutive objects. In Kalaallisut, we see that all absolutive arguments (both intransitive subjects and transitive objects) scope above negation (this also holds for other sentential operators, e.g. *-tariaqar* 'must' and *-juannar* 'always'; Bittner 1994, p. 138). We can contrast this behavior of absolutive arguments in Kalaallisut with the behavior of objects marked in 'modalis' case (essentially an oblique argument equivalent to an antipassive object in other languages) – modalis objects scope below negation. Below, the relevant arguments are in bold and the negator is italicized.

[11] As an ancillary note, Mam also allows for indefinite predicates.

(a) nuq=qa=tzan chmilb'aj qen!
only=if=well husband 1SG.PRON
'If only I were a husband!'

(63) Absolutive arguments scope above negation in Kalaallisut (Yuan 2021)

a.

Atuagaq	**ataasiq**	tikis-sima-*nngi*-laq
book.ABS	one.ABS	come-PERF-NEG-3SG.S

'There is one (particular) book that hasn't arrived'

Available readings: ∃ > NEG; *NEG > ∃ — ABS subject

b.

Suli	Juuna-p	**atuagaq**	**ataasiq**	tigu-sima-*nngi*-laa
still	Juuna-ERG	book.ABS	one.ABS	get-PERF-NEG-3SG.S/3SG.S

'There is one (particular book) that Juuna hasn't received yet'

Available readings: ∃ > NEG; *NEG > ∃ — ABS object

c.

Suli	Juuna	**atuakka-mik**	**ataatsi-mik**	tigu-si-sima-*nngi*-laq
Still	Juuna.ABS	book-MOD	one- MOD	get-AP-PERF-NEG-3SG.S

'Juuna hasn't received (even) one book yet'

Available reading: NEG > ∃, *∃ > NEG — MOD object

In order to scope over sentential negation, absolutive objects have been argued to move to a structurally high position, at least above negation; on the other hand, modalis objects remain low within the VP domain. The facts are somewhat different in the case of Inuktitut, where only absolutive objects have a forced wide scope interpretation. These facts concerning Inuktitut absolutive objects are mirrored in NPI licensing, and are used to offer an argument in favor of that language's absolutive object agreement as being recast as a case of clitic doubling.

(64) Absolutive object asymmetry in Inuktitut (Yuan 2021, p. 162)

a.

Qautamaat	**ujaraq**	kata-qatta-tuq
every.day	rock.ABS	fall-HAB-3SG.

'Every day, a rock falls (i.e., not necessarily the same rock)'

Available readings: every day > ∃; ∃ > every day — ABS subject

b.

Qautamaat	**qimmik**	taku-qatta-tara
every.day	dog.ABS	see-HAB-1SG.S/3SG.O

'Every day, I see a dog (i.e. the same dog)

Available readings: ∃ > every day, *every day > ∃ — ABS object

c.

Qautamaat	**qimmi-mik**	taku-qatta-tunga
every.day	dog.MOD	see-HAB-1SG.S

'Every day, I see a dog (i.e., not necessarily the same dog)'

Available readings: every day > ∃; ∃ > every day — MOD object

This diagnostic of scopal interpretation of objects has also been used to account for the supposedly high structural position of certain absolutive objects in the Mayan language Ch’ol. For Ch’ol, Little (2020b) demonstrates that although adverb or PP may precede or follow an absolutive object, when it precedes the object, this is evidence that that object has moved out of the VP and receives wide scope over, e.g., numerals.

(65) Ch’ol raised objects receive specific interpretations (Little 2020b, pp. 73-74, 162)

a. Mi k-*ñoj*-k’el **[cha’-tyikil wiñik]** tyi bij
IMF A1-always-see **two-CLF man** PREP way
‘I always see too men on the road’
Available readings: *ñoj* > 2; 2 > *ñoj* — Unraised object

b. Mi k-*ñoj*-k’el tyi bij **[cha’-tyikil wiñik]**
IMF A1-always-see PREP way **two-CLF man**
‘I sometimes see on the road two men’ — Raised object
Available reading: *ñoj* > 2; *2 > *ñoj*

We can extend this line of inquiry to Mam, to see if absolutive objects alone, or all absolutive arguments, occupy this hypothesized high structural position.

(66) Scope of absolutive subjects/objects and antipassive objects in Mam

a. *jaqa q’iij* n-∅-tzaj tz’aq **[jun xaq]**
every day INC-B2/3S-DIR fall **INDF rock**
‘Every day a rock falls’
Available reading: ∃ > every day; every day > ∃ — ABS subject

b. *jaqa q’iij* n-∅-ok n-che’ya **[jun txi’yaan]**
every day INC-B2/3S-DIR A1S-see.DS **INDF dog**
‘Every day I see a dog’
Available readings: ∃ > every day; every day > ∃ — ABS object

c. *jaqa q’iij* n-chin che’ya t-i’j **[jun txi’yaan]**
every day INC-B1S see.AP 2/3S-RN:OBL **INDF dog**
‘Every day I see a (particular) dog’
Available reading: ∃ > every day; *every day > ∃ — AP object

We see that a narrow reading is forced in the case of the antipassive object, whereas there is no forced broad or narrow interpretation for either the absolutive subject or absolutive object. A similar effect can be seen when we look at sentential negation: antipassive objects take obligatory wide scope with respect to negation. Absolutive objects do not have a forced reading.

(67) Scope of absolutive *vs.* antipassive objects under sentential negation

a.

mii'n	o	tz'-etz	t-laq'o-'n	Juana	**[jun**	**u'j]**
NEG	COM	B2/3S-DIR	A2/3S-buy-DS	Juana	INDF	book

'Juana hasn't bought a (any) book yet'
Available reading: ∀ > ∃; *∃ > ∀ ABS object

b.

mii'n	e-∅-laq'oo-n	Juana	**[t-i'j**	**jun**	**u'j]**
NEG	COM-B2/3S-buy-DS	Juana	A2/3S-RN:OBL	INDF	book

'Juana hasn't bought a (particular) book yet'
Available reading: ∃ > ∀; *∀ > ∃ AP object

This effect is repeated when quantification is used inside the absolutive argument. In Mam, we see that, for example, the universal quantifiesr *enterra=x* 'every' in the external argument (ergative agent) only receives narrow interpretation, unlike in Mandar (mentioned earlier) where a quantifier in the internal object binds a variable in the external argument (Brodkin 2021).

(68) Universal quantifier scopes over absolutive object

a.

ma	∅-txi'	ch-leera	[*enterra=x*	qa	ku'waal]	**[jun**	**ujb'il]**
PROX	B2/3S-DIR	A2/3P-read.DS	every=ENCL	PL	child	INDF	book

'Every child read a book' (a distinct book is read by each child)
Available reading: ∀ > ∃; *∃ > ∀ ABS object

b.

ma	chi-leera	[*enterra=x*	qa	ku'waal]	**[t-i'j**	**jun**	**libro]**
PROX	B2/3P-read.AP	every=ENCL	PL	child	A2/3S-RN:OBL	INDF	book

'Every child read a book' (the same particular book is read by each child)
Available reading: *∀ > ∃; ∃ > ∀ AP object

We see here in the case of universal quantifiers that absolutive objects scope under subjects, while antipassive objects scope over subjects. As antipassive objects are not expected to raise (or, for that matter, to receive wide scope), the fact that they receive the interpretation they do is somewhat mysterious, and more work should be undertaken to uncover why antipassive objects are interpreted as they are. Regardless, we see that these scopal relations are the reverse of what has been predicted if absolutive objects, but not antipassive objects, are raised in a right-spec syntax.

3.4 Evidence from subextraction

The final piece of evidence which has been used to support a derivation of VSO in which the object moves (overtly) above the subject is subextraction. Specifically, a prediction of the object movement account states that a moved object, since it has undergone movement, should be "frozen" (following the Freezing Principle; Ross 1974, Wexler & Culicover 1977), and therefore an island for subextraction.

This leads leads to a straightforward prediction concerning the behavior of absolutive objects, as opposed to other arguments, including absolutive subjects. We should see that subextraction from absolutive objects, which are assumed to be movement-derived islands, should be impossible, whereas subextraction from absolutive subjects, which by hypothesis do not undergo movement, should be licit. This subextraction asymmetry has been documented for Ch'ol by Little (2020b). In this language, we see that stranding the possessum in a complex *wh*-expression is possible, but only if it is from an absolutive subject (69).[12] Stranding the possessor from an absolutive object is ungrammatical (70).

(69) Ch'ol subextraction from absolutive subjects (Little 2020b, p. 101)

a. **Majki**$_i$ ta' yajl-i [**i-wakax** $\boldsymbol{t_i}$] ?
who PFV fall-IV **A3-cow**
'*Whose* cow fell?'

b. [**Majki i-wakax**]$_i$ ta' yajl-i $\boldsymbol{t_i}$?
who A3-cow PFV fall-IV
'Whose cow fell?'

---

[12] Subextraction is associated with focus on the extracted constituent (69a) in Ch'ol (Little 2020b, p. 100). In the B example, the speaker is simply asking whose cow fell, but in the A example, the speaker has not properly heard the name of the cow's owner and is seeking clarification.

(70) Ch'ol subextraction from absolutive objects (Little 2020b, p. 102)

a. ***Majki*i*** ta' a-k'el-e **[i-chich** ***t*i**] ?
who PFV A2-see-TV **A3-sister**
Intended: '*Whose* sister did you see?'

b. **[Majki i-chich]*i*** ta' a-k'el-e ***t*i** ?
who A3-sister PFV A2-see-TV
'Whose sister did you see?'

This asymmetry between subextraction from absolutive subjects *vs.* objects is taken as evidence that whereas absolutive subjects do not move, absolutive objects are movement-derived – *frozen* – islands. We can therefore apply the same diagnostic to Mam, to see if a parallel asymmetry exists. If so, we may take this as evidence that, like Ch'ol, Mam absolutive objects undergo movement. We see in (71)-(72) below that indeed, subextraction out of absolutive subjects is licit; this is the same if the intransitive verb is unaccusative (71) or unergative (72). Presence of a directional does not change this fact.[13]

(71) Mam subextraction from unaccusative subject

a. **[Al*i*]** e-Ø-jaw tz'aq **[t-anb'a** ***t*i**] ?
Who COM-B2/3S-DIR fall **A2/3S-sister**
'Whose sister fell?' Stranding

b. **[Al t-anb'a]*i*** e-Ø-jaw tz'aq ?
Who A2/3S-sister COM-B2/3S-DIR fall
'Whose sister fell?' Pied-piping

(72) Mam subextraction from unergative subject

a. **[Al*i*]** e-Ø-b'ixa **[t-anb'a** ***t*i**] ?
Who COM-B2/3S-dance **A2/3S-father**
'Whose sister danced?' Stranding

b. **[Al t-anb'a]*i*** e-Ø-b'ixa ?
Who A2/3S-sister COM-B2/3S-dance
'Whose sister danced?' Pied-piping

[13] Unlike in Ch'ol, subextraction of the *wh*-possessor from the DP is not associated with particular focus semantics; the A and B examples in (68-69) receive the same interpretation.

We can see above that subextraction from any absolutive/intransitive subject above is licit in Todos Santos Mam. In contrast, we may look at the behavior of absolutive objects, which do not permit fronting of the interrogative possessor without pied-piping (73).

(73) Mam subextraction from absolutive object

a.

***[Al$_i$]**	x-Ø-kub'	t-b'iyo-'n	Juan	**[t-wixh**	***t$_i$*]**	?
Who	DIST-B2/3S-DIR	A2/3S-kill-DS	Juan	**A2/3S-cat**		

Intended: 'Whose cat did Juan kill?'
Possible (with different bracketing) as 'Who killed Juan's cat?' — Stranding

b.

[Al	**t-wixh]$_i$**	x-Ø-kub'	t-b'iyo-'n	Juan	***t$_i$***	?
Who	**A2/3S-cat**	DIST-B2/3S-DIR	A2/3S-kill-DS	Juan		

'Whose cat did Juan kill?' — Pied-piping

As the foregoing examples show, there is an asymmetry between these absolutive subjects and objects, as the foregoing exmples show. However, not all types of absolutive subjects work the same way: we may look at *derived* absolutive subjects, i.e. those that are the subjects of passives and antipassives, which take semantic objects but are syntactically intransitive.

(74) Mam subextraction from derived absolutive subject: antipassives

a.

***[Al$_i$]**	x-Ø-kub'	b'iyoo-n	**[t-man**	***t$_i$*]**	t-e
Who	DIST-B2/3S-DIR	kill-AP	**A2/3S-father**		A2/3S-RN:PAT
jel	b'alam?				
CLF	jaguar				

Intended: 'Whose father killed the jaguar?' — Stranding

b.

[Al	**t-man]$_i$**	x-Ø-kub'	b'iyoo-n	***t$_i$***	t-e
Who	**A2/3S-father**	DIST-B2/3S-DIR	kill-AP		A2/3S-RN:PAT
jel	b'alam?				
CLF	jaguar				

Whose father killed the jaguar?' — Pied-piping

(75) Mam subextraction from derived absolutive subject: passives[14]

a.

***[Alee*_i_]**	ma	Ø-kub'	b'iy-eet	**[b'alam *t*_i_]**	t-u'n	
whose	PROX	B2/3S-DIR	kill-PASS	**jaguar**	A2/3S-RN:AGT	

xin	xjaal?
CLF	man

Intended: 'Whose jaguar was killed by the man?' Stranding

b.

[Alee	**b'alam]*_i_***	ma	Ø-kub'	b'iy-eet	***t*_i_**	t-u'n
whose	**jaguar**	PROX	B2/3S-DIR	kill-PASS		A2/3S-RN:AGT

xin	xjaal?
CLF	man

'Whose jaguar was killed by the man?' Pied-piping

As such, it appears that not all absolutive subjects have identical properties with respect to subextraction: while *derived* absolutives (antipassive and passive subjects) are islands for subextraction, non-derived absolutives ("simple" intransitive subjects) are not. Pressing further, we can consider other types of arguments which are likewise unable to be subextracted out of.

First, we see that neither the direct object (76) nor the indirect object (77) of a ditransitive are possible targets of subextraction. Recall that word order in a (non-applicative) ditransitive construction is V-S-DO-IO.

(76) Mam subextraction from ditransitive DO

a.

***[Al e*_i_]**	o	Ø-txi'	t-k'a'ya	**[carro *t*_i_]**	t-e	Rosa?
whose	COM	B2/3S-DIR	A2/3S-sell.DS	car	A2/3S-RN:PAT	Rosa

Intended: 'Whose car did you sell to Rosa?' Stranding

b.

[Al e	**carro]**	o	Ø-txi'	t-k'a'ya	***t*_i_**	t-e	Rosa?
whose	**car**	COM	B2/3S-DIR	A2/3S-sell.DS		A2/3S-RN:PAT	Rosa

'Whose car did you sell to Rosa' Pied-piping

(77) Mam subextraction from ditransitive IO

a.

***[Al e*_i_]**	o	Ø-txi'	t-k'a'ya	carro	**[mamb'aj *t*_i_]** ?
whose	COM	B2/3S-DIR	A2/3S-sell.DS	car	**father**

Intended: 'Whose father did you sell the car to?' Stranding

[14] For convenience in glossing, as well as for ease in reading, I do not individually gloss *Al e* as 'who rn:gen,' but rather simply as 'whose.' For more information on PPI in Mam, refer to Chapter 2, §6.2.1.

b.

[Al e	**mamb'aj]***$_i$*	o	Ø-txi'	t-k'a'ya	carro	***t***$_i$?
whose	**father**	COM	B2/3S-DIR	A2/3S-sell.DS	car	

'Whose father did you sell the car to?' Pied-piping

Todos Santos Mam Mam also has an applicative ditransitive construction, which involves the applicative suffix *-b'a* followed by the subject, the applied object, and finally the recipient/oblique object within a relational noun phrase.

(78) Baseline Mam applicative

ma	tz'-ok	t-juu-**b'a**	Juan	[tze']$_{APPL.O}$	[t-i'j	txi'yaan]$_{OBL}$
prox	b2/3s-dir	a2/3s-hit-**appl**	Juan	stick	a2/3s-rn:obl	dog

'Juan hit the dog with a sick'

(79) Mam subextraction from applied object

a.

[Al e$_i$**]**	ma	tz'-ok	t-juu-b'a	Juan	**[t-tze'** ***t***$_i$**]**	t-i'j
Whose	PROX	B2/3S-DIR	A2/3S-hit-APPL	Juan	stick	A2/3S-RN:OBL

txi'yaan?
dog
Intended: 'Whose stick did Juan hit the dog with?' Stranding

b.

[Al e	**t-tze']**	ma	tz'-ok	t-juu-b'a	Juan	t-i'j
Whose	**B2/3S-stick**	PROX	B2/3S-DIR	A2/3S-hit-APPL	Juan	A2/3S-RN:OBL

txi'yaan ***t***$_i$?
dog
Whose stick did Juan hit the dog with?' Pied-piping

(80) Mam subextraction from oblique argument of applicative

a.

[Al e$_i$**]**	ma	tz'-ok	t-juu-b'a	Juan	tze'	**[t-i'j**
Whose	PROX	B2/3S-DIR	A2/3S-hit-APPL	Juan	stick	**A2/3S-RN:OBL**

t-txi'yaan ***t***$_i$**]** ?
A2/3S-dog
Intended: 'Whose dog did Juan hit with a stick?' Stranding

b.

[Al e	**txi'yaan]**$_i$	ma	tz'-ok	t-juu-b'a	Juan	tze'
Whose	**dog**	PROX	B2/3S-DIR	A2/3S-hit-APPL	Juan	stick

[t-i'j	t_i**]**	?
A2/3S-RN:OBL		

'Whose dog did Juan hit with a stick?' Pied-piping

Extraction from the arguments of an applicative verb are not on their own surprising, considering two independent facts of applicative syntax in Mayan and beyond. Following (McGinnis 2008), I take applied arguments to be A-moved from their base positions to where they can be the internal argument of the applicative verb; as such, they are frozen, and subextraction from them should not be able to proceed. Second, extracting from an RNP, as we will see more specifically below, is cross-linguistically uncommon and is usually impossible in Mayan (Coon 2013, Coon & Preminger 2013, Little 2020b); thus, the impossibility of subextraction here can be identified as a feature of obliques/PPs/RNPs.

(81) Mam subextraction from RNP

a.

***[Al e**$_i$**]**	e-Ø-xyaaj	tey	**[t-u'j**	**t-ja'**	t_i**]** ?
Whose	COM-B2/3S-go.and.returrn	you	**A2/3S-RN/in**	**A2/3S-house**	

Intended: 'Whose house did you go to?' Stranding

b.

[t-u'j	**al e**	**t-ja']**	e-Ø-xyaaj	tey	t_i ?
A2/3S-RN/in	**whose**	**A2/3S-house**	COM-B2/3S-go.and.return	you	

'Whose house did you go to?' Pied-piping

As just mentioned, the fact that RNPs would be islands for subextraction is not unexpected. In other Mayan languages, such as Ch'ol, it has been argued that PPs (which are functionally equivalent to RNPs) are adjuncts, and their behavior here stems from the fact that they are adjunct islands (Coon 2013, Coon & Preminger 2013, Little 2020b). Like Ch'ol PPs, RNPs in Mam are never selected for as complements to verbs or nouns, showing that they are truly adjuncts.

With the above subextraction facts in hand, the conclusion reached is that subextraction is only available from *underived absolutive subjects* (refer to exmples 71-72 above). Derived absolutive subjects (of antipassives and passives), direct and indirect objects of ditransitive verbs/applicatives, and RNPs have been shown to be islands for subextraction. It is unlikely that a single property unites all of these cases, and more work deserves to be done specifically with regard to the derivation of *derived* absolutive subjects, which appear to have some kind of dissimilarity to underived absolutive subjects, though it is not entirely clear what or why. Regardless, we can draw some conclusions from the above data. First, the property of being an absolutive argument does not, in and of itself, permit subextraction (we see this for absolutive objects and also derived absolutive subjects). Therefore, the data are somewhat inconclusive, in that subextraction cannot on its own cannot show with certainty that absolutive objects, but not other types of absolutives, are movement-derived islands.

It is also important to note that the above conclusions also allow us to refute a derivation of Mam VSO as VP remnant raising. Recent work by Yuan (2023) and Hedding & Yuan (2023) propose that the availability of subextraction should be limited to those constituents which have been agreed with, such that they are "unlocked" for future movement (under the theory of *phase unlocking*: Rackowski & Richards 2005, van Urk and Richards 2015, Halpert 2019, Ershova to appear). That is, Agree is a necessary step before movement out of a phase is possible. They argue that their languages of study, two Mixtec varieties (San Juan Piñas Mixtec and San Martín Peras Mixtec), achieve VSO word order through raising of the VP remnant. As evidence, they show that there is a restriction specifically on external arguments (transitive subjects and unergatives) such that they may not be subextracted out of. They take this as evidence that all internal arguments (transitive objects and unaccusatives) must vacate the VP via A-movement (to, e.g., Spec,*v*P) before the VP remnant fronts, thereby being "unlocked" for further subextraction. This pattern of specifically internal arguments being able to be subextracted out of is good evidence for VP remnant raising in these Mixtec languages, but we do not see a parallel pattern in Mam. As we saw above, all underived absolutive DPs (whether unergative or unaccusative) are possible targets for subextraction, whereas transitive objects are not. As such, Mam does not show a pattern whereby all and only internal arguments, which by hypothesis vacate the VP under a VP remnant raising analysis, are able to be subextrated out of. We can take this fact as further evidence that VP remnant raising is not a feasable approch to VSO word order in Mam.

4 Lower-copy spellout

Thus far in this chapter, I have provided evidence from a variety of diagnostic tests that head-movement, not predicate remnant raising or right-spec, is strongly supported by the data.

For head-movement over predicate remnant raising (Section 2), I applied five tests: (i) the mirror ordering of morphemes; (ii) the variable positions of directionals; (iii) VP ellipsis; (iv) the position of adverbs; and (v) negation. These tests suggest that the verb alone, and not a VP remnant, moves to clause-initial position in Todos Santos Mam. As to whether or not Mam's objects are diagnosable as structurally high (under a right-spec syntax), the data are somewhat less clear, but none of the expected suite of high object effects found in related Mayan languages like Ch'ol were replicable in Mam. We saw diagnostic tests from (i) binding, (ii) definiteness, (iii) scopal interpretations, and (iv) subextraction that do not straightforwardly suggest that absolutive objects (as opposed to other types of arguments) occupy a structurally high position.

In all, I show that these syntactic diagnostics are fruitful areas of investigation into how a verb-initial language derives its word order, and must be used as additional metrics to supplement prosodic data. Indeed, further data in support of verb raising as Mam's path to VSO is presented in Chapter 4 to follow.

4.1 But don't objects move for high-abs syntax in Mam?

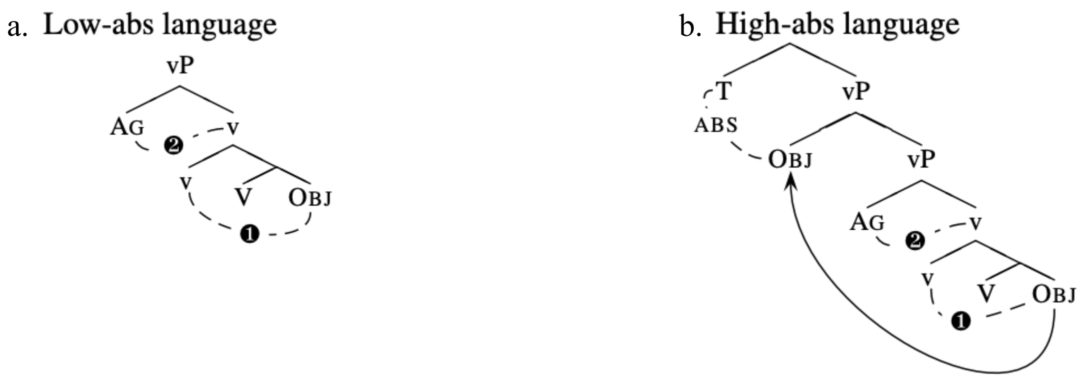
The fact that objects are not diagnosable as structurally high in Mam, as opposed to in a language like Ch'ol, is puzzling, due to the fact that it is well understood that in high-abs languages like Mam, the object is expected to raise, since we are able to see a range of EEC effects due to the object intervening between some probe and the subject. A schematization of O>S inversion, which is traditionally though to lead to high-abs languages' sensitivity to the EEC, is given below in (82).

(82) Raising of O in high-abs Mayan blocks extraction of S (diagram from Royer 2022, p. 25)

[$_{CP}$ ___ … [$_{v/VoiceP}$ OBJECT [SUBJECT [$_{VP}$ V <OBJECT>]]]]

If there is no test which is able to show on semantic grounds that the object is structurally high (the conclusions from §3), what does that mean for our understanding of Mam's demonstrable high-absolutive syntax? We may begin our discussion with recent work by Royer & Deal (2023), who try to understand why objects in high-abs languages move in the first place. They argue that the high-/low-abs division in Mayan boils down to the flavor of v^0 each language type has. In both language types, v^0 agrees twice, but the outcomes of agreement are fundamentally different. In low-abs languages, the probe on v^0 agrees with the object (triggering low Set B agreement), and then with the subject (triggering Set A agreement). In high-abs languages, the probe on v^0 also agrees with the subject (triggering Set A agreement), but instead of realizing low Set B agreement, simply moves the object to its specifier (perhaps via an [EPP] feature (Coon et al. 2021; see also Scott & Sales 2021, Scott 2023). Schematizations of the two absolutive parameter settings for Mayan are given below in (83). Ordered Agreement steps in Royer & Deal's theory of Agree are shown as well.

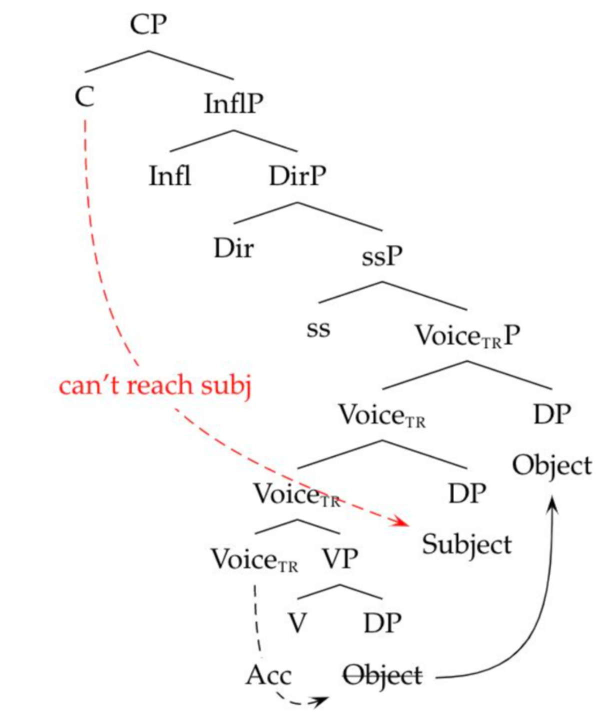
(83) Low- *vs.* high-abs specification as flavors of v^0 (Deal & Royer 2023)



The fact that certain languages have [EPP] features on v^0 causing object movement is somewhat suspicious due to the fact the EPP should by satisfied by the subject/agent already in the specifier of the (lower) *v*P. But if we disregard why the object moves, and accept simply that it does move, there are a number of consequences. Namely, if objects move leftward, we would always expect that the order of post-verbal arguments to be O, then S. As a consequence, there should be no high-abs VSO languages, a fact which Mam straightforwardly falsifies.

There are two potential fixes for this probem. First, Royer (2022), following Clemens & Coon (2018), argues that there could be phonological constraints which drive VSO instead of VOS in certain languages. That is, while O>S could be the structure in the narrow syntax, these constituents may be *phonologically reordered* at PF. Second, Scott & Sales (2021) and Scott (2023), following Little (2020b), adopt a right-spec syntactic structure whereby objects move rightward and overtly. In the diagram below, we see how rightward and overt object movement traps in the subject, generating the range of EEC effects.

(84) Right-spec within the verbal domain (Scott & Sales 2021, sl. 42)



Regardless of whether, per Royer (2022), prosodic reordering occurs, or, per Scott & Sales (2021) and Scott (2023), overt object movement occurs, at some level of structure the object should be able to realize some suite of properties which fall out from its high structural position. However, the diagnostic tests set forth in §3 seem to show that those properties do not hold, at least for Mam. To this result, we may say one of two things. First, it is possible that in Mam, relations such as binding hold a level of structure before object movement. However, it has been established that high-abs object movement is a type of A-movement (Coon et al. 2021), which is thought not reconstruct for Condition C (Chomsky 1995, Fox 1999, among others). Other high-abs languages such as Mandar (Brodkin 2023) have shown that object raising indeed feeds binding.

As a second potential fix for this dilemma, we could re-evaluate our diagnostics for or against right-spec syntax, restated below in (83).

(85) Predictions for high objects following (overt) movement (Little 2020)

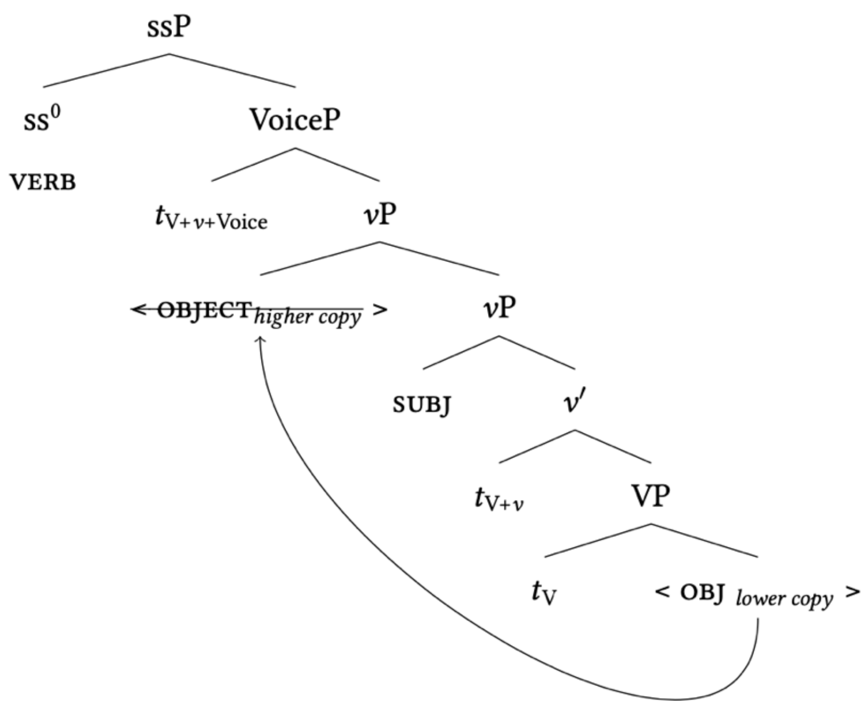
a. binding: objects are predicted to bind into subjects;
b. scope: objects are predicted to scope over (material in) subjects;
c. definiteness: objects are predicted to always be definite; and
d. subextraction: objects are predicted to be islands for subextraction

We saw that the binding test (85a), and perhaps also the scopal test (85b), may be re-analyzable as a constraint against obviative arguments being interpreted before proximate arguments (e.g., Aissen 1997, 1999; Zavala 2007). For definiteness (85c), it is possible that because object movement in fixed-VSO languages like Mam is not exclusively linked to definiteness (as in VOS/VSO-alternating languages), this diagnostic in itself is not applicable to Mam. As far as subextraction (85d) is concerned, I am not able to tell for Mam specifically whether movement is critical step for a constituent to be an island for subextraction (see also Yuan 2023 and Hedding & Yuan 2023 for argumentation tht movement actually feeds subextraction in Mixtec languages). This is due to the fact that non-derived and derived absolutive subjects pattern differently with respect to subextraction restrictions in Mam, which should not come down to a difference in movement, as far as I am aware.

If we assume that objects in Mam should in faact move, given its high-abs syntax and EEC effects, then it seems as though there is insufficient evidence to argue in favor of either the prosodic reordering account or the right-spec account of high objects, at least on purely semantic grounds. We may find our answer in the prosody, which is discussed in detail in Chapter 4 to follow. Per Clemens (2021), a right-spec high object should be phrased as its own phonological constituent – a phonological phrase φ, with concomittant pause – whereas if this is not the case, subject and object are expected to phrase together in single φ. We will see in Chapter 4 that the prosodic evidence does not support the object DP being phrased within its own maximal phonological phrase, indicating, at least when purely intonational evidence is taken into account, right-spec overt high objects seem the more dubious option. What, then, can we say derives object movement but strictly VSO word order?

It is possible that, although movement of the object occurs for case or EPP reasons, we can claim that only the moved object's *lower copy* spells out. Under the copy of movement (see Bošković & Nunes 2007, Corver & Nunes 2007 for a review), syntactic movement results from Merging of a copy of an element in some higher position. In many languages, the lower copy is deleted at PF, although there is evidence from a number of languages that both copies or either copy may be spelled out. Taking this assumption in hand, Brodkin (2023) argues that in Mandar, a high position of objects cannot be reconciled with VSO word order unless the *lower* copy of movement is spelled out.[15] We can potentially adopt a similar analyis for Mam, where the higher copy instigates the intervention effect behind the EEC, but only the lower copy is spelled out. This allows us to disregard a prosodic reordering account of object in strictly VSO languages, for which no independent evidence can be advanced.

(86) Lower copy spellout of absolutive object



[15] Pronunciation of a lower copy of a movement chain has usually been taken to only be available if pronunciation of the higher copy/head of the movement chain would result in a PF violation (see Bošković 2001 p. 176 for relevant citations). What precisely the PF violation would be for the high copy of the object to be pronounced cannot, at this point, be definitevely understood; however, the availability of lower-copy spell-out would straightforwardly account for VSO high-abs Mayan languages like Mam without making express reference to prosodic reordering as an interface constraint.

CHAPTER 4

Prosodic phrasing in Mam

1 Introduction & goals

The preceding chapter outlined a varity of syntactic diagnostics that support Mam's VSO word order as being derived from verb raising. This chapter describes a production experiment undertaken to answer two major questions about Todos Santos Mam, which will provide a second angle on the structure of Mam's VSO.

- What is the prosodic phrasing in the language, i.e. what are the the diagnostics of intonation we can observe which serve to demarcate particular prosodic constituents?

- How does this prosodic phrasing correlate with syntactic structure, i.e. is it expected given the syntactic tree from which the prosodic phrasing has been mapped?

As described in Chapter 1, much prior research has found that there is often a high degree of isomorphism between the syntactic structure of a given utterance and that utterance's prosodic phrasing. Fundamentally, this isomorphism exists to facilitate the production and perception of chunks of syntactic structure.

That said, languages also have been observed to exhibit syntax-prosody non-isomorphism (mismatch), whereby the prosodic constituents in evidence do not line up in an (expected) one-to-one fashion with their syntactic referents (see Kalivoda 2018, Bennett & Elfner 2019, Kalivoda & Ishihara 2022 for a review). This mismatch may arise from a number of factors. First, the prosodic structure may be compelled to satisfy purely phonological conditions on form (eurhythmic constraints, also called "wellformedness"), which are not inherited from the syntax proper. These include constraints on binarity, phonological weight, and prosodic sisterhood. Other factors include information structure (including focused constituents and the relative contrast of old *vs.*

new information in the discourse; see, e.g. İşsever 2003 on Turkish; Downing et al. 2004 for Chichewa; Féry 2007, 2013 on German and other European languages; also see Dufter & Gabriel 2018 for an overview), semantic and pragmatic weight, and even speech rate (see, e.g., Jun 2003 on Korean, Prieto 2005 on Catalan). Each of these factors has been well understood to induce syntax-prosody mismatch since very early work within prosodic hierarchy theory (e.g., Selkirk 1986; Nespor & Vogel 1986; Jun 1993/1996, 1998; Truckenbrodt 1995, 1999).

Due to the possibility for syntax-prosody mismatch, theories of syntax-prosody mapping which allow mismatch to arise in satisfaction of these various factors, for example Match Theory (Selkirk 2011), have been popular in recent years. The central premise of Match Theory is that prosodic structure is mapped from syntactic structure in satisfaction of mapping constraints which enforce syntax-prosody isomorphism (the MATCH family of constraints). These constraints outrank wellformedness constraints (thereby generating isomorphism), or are outranked by them (thereby generating mismatch). A certain language's prosodic structure is thus a language-specific optimal balance between these two drives operating at cross-purposes.

The purpose of this experiment, then, is to understand the prosodic structure of Mam, in order to use this informtion to better understand the relationship between syntactic structure and prosodic structure. I ultimately advance two major conclusions in this chapter. The first conclusion is that Mam's prosodic phrasing displays a strong isomorphic mapping from its source syntactic structure, at which I arrived in the previous chapter. As such, it largely resembles other well-documented prosodic structures for verb-initial languages, such as Irish (Elfner 2012, 2015) and Tagalog (Richards 2017). A comparison of theories of the syntax-prosody interface (Match Theory *vs.* Align/Wrap Theory) shows that Match Theory is able to predict the Mam phrasings, whereas Align/Wrap Theory is insufficient. The second conclusion is that Mam's verbal directional auxiliaries ("directionals") phrase as if they were independent prosodic words, and not as if they were themselves XPs. This provides further support for the status of directionals as simple syntactic heads Dir^0 which project in the clausal spine above the landing site of the raised verb.

This chapter is organized as follows. In §2, I outline the methodology of the experiment, including a discussion of speakers, elicitation technique, stimuli, and analytical background. In §3, I show the results of the study, providing justification for the conclusions described above. §4 takes these results in hand, and analyzes Mam's mapping from syntax onto prosody within Optimality Theory, comparing two competing theories of the interface: Match Theory and Align/Wrap Theory.

2 Methodology

This section outlines the process for data collection. I describe the speakers participating in the study, experimental methodology, the materials used (including the rationale behind which stimuli were used), and the phonetic/prosodic measures analyzed.

2.1 Speakers

Five speakers participated in this study. All were between 18-30 years old, and had been born in Todos Santos, Cuchumatán, Guatemala, though they currently reside in Oakland, California where there is a sizable population of Mam-speaking Guatemalan immigrants from Todos Santos. All had spent their entire childhoods in Todos Santos, and spoke it as a first language. Three speakers, W, S, and I, spoke Mam as a first language, then Spanish as a second or co-first language, and then English after moving to the United States. Two of the five, Speaker A and Speaker F, spoke no English, being bilingual in Mam as L1 and Spanish as co-L1/L2. All speakers reported speaking Mam primarily within their households, such as with parents and siblings, as well as Mam-speaking friends in the Oakland community. The speakers also often reported visits back to Todos Santos to visit other family and community members who live in Guatemala full time, meaning that the language is spoken among native speakers both at home and abroad. Speakers were compensated for their time participating in the study.

2.2 Elicitation technique

Following Wagner (2014), who undertook a production study on the intonation of the Mayan language Q'eqchi', I want to describe the elicitation technique employed for this study. As Wagner points out, working on an under-documented Mayan language presents a host of difficulties when it comes to stimulus design and data collection. He notes that a common practice in intonational studies (e.g. Nielsen 2005, Khan 2008, Zheng & Pierrehumbert 2010) is to allow speakers to familiarize themselves with the stimuli before the microphone is turned on and the recording is made. Incorporating this methodological step has shown to be important, as there is a noted difference between freely-uttered speech and speech that is read (Mayo et al. 1997). In order to ensure that the target sentences were uttered in as natural a manner as possible, given the circumstances, speakers had a chance to review the stimuli with me at the beginning of the elicitation session. This had a number of benefits, namely: (i) ensuring that the sentences were understandable, both grammatically and orthographically; (ii) ensuring that the translations were appropriate; and (iii) allowing speakers the opportunity to make minor adjustments if a sentence was transcribed or translated in a way that was unfamiliar to them or deemed otherwise incorrect. I asked the speakers to practice any sentences with which they wished to better familiarize themselves before the recording was made.

2.3 Stimuli

In this study, in order to understand the prosodic phrasing of transitive and intransitive clauses in Mam, speakers produced sentences in Mam across a number of experimental conditions. The conditions in the study were constructed in order to highlight the influence of two main variables on prosodic constituency in both transitive and intransitive clauses: presence of directional and nominal modification (adjective). We therefore have several hypotheses. First, we may predict that the presence of a directional (i.e. the transitive/intransitive condition) will impact the prosodic phrasing of the sentence. Second, we may predict that the presence or absence of adjectives will likewise impact the prosodic phrasing of the sentence by virtue of their adding more phonological weight to the phrases they modify.We may also consider counter-hypotheses to both: that there will be no difference in phrasing across either the directional or adjective conditions.

To explore these potential differences, see Table 1 below. We see that sentences came in four types, or blocks. The first 2 blocks contained transitive sentences: Block 1 had transitive verbs with directionals, and Block 2 had transitive verbs without directons. Both Blocks 1 and 2 had sub-conditions where the subject and object phrases (held consistent across sub-conditions) were both modified by an adjective. The second two blocks contained intransitive sentences: Block 3 had intransitive verbs with directionals, and Block 4 had intransitive verbs without directionals. Like before, each block also had two sub-conditions based on the presence or absence of adjectives modifying the subject phrase and the object phraase.

There were 10 sentences per smallest condition, totalling 80 target sentences across the four blocks (10 sentences * 2 sub-conditions * 4 blocks). Table 1 breaks down the experimental stimuli into their various conditions. Example sentences for each block are given in Appendix B.

Table 19: Breakdown of experimental stimuli

	Verb type	Directional?	SubjP and ObjP adjective?
Block 1	Transitive	Directional	Adjective
			Unmodified
Block 2	Transitive	No directional	Adjective
			Unmodified
Block 3	Intransitive	Directional	Adjective
			Unmodified
Block 4	Intransitive	No directional	Adjective
			Unmodified

The experimental design required these Mam sentences to be in written form, and read aloud by participants into a microphone. As discussed above, sentences were normed by participants before being read, which did not involve changing word order, but simply small changes in spelling which individual speakers reported made task more comfortable for them.

In each sentence, an adjunct phrase (either *ewa* 'yesterday' or *jachixjnab'a* 'last year') was placed in sentence-final position of all tokens to avoid potentially confounding phrase-final prosodic effects on the object phrases. In order to control for eurhythmic effects of individual words, all head nouns and adjectives were at least disyllabic (Clemens & Coon 2016). Lastly, all words in the target sentences were as sonorant-rich as possible in order to ensure accurate pitch tracks. These last two desiderata were rather difficult, as Mam is a language with mostly monosyllabic, obstruent-rich roots; I consulted a Todos Santos word list (Sitler 2002) for roots to include if I had not previously encountered them through structured elicitation. A list of sentences used in the experiment is given in Appendix B.

2.4 Measures

After I finished collecting the data, I analyzed the spoken utterances using Praat version 6.0.43 (Boersma & Weenink 2022). The data analysis comes in a number of parts, as the following section will explore. First, I analyzed and labelled the intonational contours of sentences under the Autosegmental-Metrical (AM) framework of intonational phonology and the Tones and Break Indices (ToBI) transcription system (Beckman & Pierrehumbert 1986, Beckman & Hirschberg 1994), which I will describe in more detail below. This process involved making visual observation of each sentence's spectrogram and pitch track (generated automatically in Praat). A number of measures were additionally taken for each token, outlined in (1) below.

(1) Measures taken for each token
- Pitch events
- Pitch measurements (downstep)
- Pause between constituents

2.3.1 ToBI labelling conventions

No previous analysis of Mam prosody exists. As noted earlier, most intonational features remarked upon previously for any variety of Mam are not particularly detailed. England (1983b, p. 249) noted that in Ixtahuacán Mam, declarative sentences end in pitch falls and interrogative sentences end in pitch rises. Pérez Vail (2014, pp. 73-80) also briefly discusses certain prosodic configurations as used to encode definiteness contrasts in Cajolá Mam. This chapter, and indeed the rest of this dissertation, does not purport to propose a full autosegmental-metrical model of the intonation of Mam; the present experiment is more interested in understanding the prosodic phrasing of particular types of sentences, namely VSO declaratives. Much future work on Mam intonation is certainly necessary (on interrogatives, topic/focus, other word orders, etc.) and should be the topic of future research. This dissertation is primarily concerned with Mam's prosodic phrasing of major constituents (verbs, subjects, objects, adjectives, adjuncts) in order to understand the connection between prosodic phrasing and the reference syntax from which prosodic structure is mapped. This research goal, then, is more in line with Clemens & Coon's (2016, 2018) prosodic investigation of the Mayan language Ch'ol, and less in line with full intonational models of Mayan languages such as Wagner's (2014) on the Mayan language Q'eqchi'.

That said, the analysis for this study is still couched within the autosegmental-metrical (AM) framework (Bruce 1977; Pierrehumbert 1980; Ladd 1996/2008; Gussenhoven 1984; Liberman and Pierrehumbert 1984; Beckman & Pierrehumbert 1986; Pierrehumbert & Beckman 1988; Pierrehumbert & Hirschberg 1990). AM is the framework under which intonational phonology was initially developed, and describes how intonational contours are analyzed, and what factors govern intonational phrasing.

For the analysis of utterances, I use the Tones and Break Indices convention (ToBI; Beckman & Hirschberg 1994; Beckman & Ayers-Elam 1997, Beckman et al. 2005). ToBI is a labelling convention or analytical system used for transcribing intonation phonologically, which is composed of two main arms: the transcriptions of tonal targets, and the prosodic structure of the utterance using break indices (discussed below). In ToBI, a token is analyzed under four "tiers", where information relevant to prosody are labelled; in the figures to follow, which show particular tokens, each tier is represented as its own section within that token's visual representation. The four tiers are a tone tier (for transcribing tone targets), an orthographic tier (for transcribing the segmental content of the token), a break index tier (for transcribing prosodic structure), and a miscellaneous tier (for other comments). Depending on the language, a variety of tiers may be required to best fit the language of study, e.g. Peng et al.'s (2005) Chinese ToBI, or Jun's (2000, 2005) Korean ToBI. The set of four tiers described here, with no additions or alterations, proved sufficient for the present study. I discuss these four tiers in turn below.

First, I discuss the tones which will be labelled on the tone tier. The ToBI model makes a distinction between two types of pitch events: pitch accents and boundary tones. Pitch accents are localized on intonationally prominent syllables, whereas boundary tones are anchored at the left/right edges of larger prosodic constituents, such as the phonological phrase. Languages vary as to which pitch accents and boundary tones are used in the intonation. We will see in Mam that there are several types of pitch accents, which appear in direct relation to the stress pattern on a given word. For Mam, I find that L+H* indicates a high tone target on a stressed syllable preceded by an unstressed syllable with a low tone target. It is essentially a rising contour, with prominence on the high tone; I will shorten this to just LH* for clarity. Another rising tone, L*+H (L*H for clarity), is found on words with a stressed syllable followed by another unstressed syllable. H* in

Mam refers to the high tone target on a stressed syllable which is not preceded by any low target. We see this in instances where there is only one syllable in the word; the whole rising contour we see eleswhere is not "condensed" onto a single syllable. High tone targets may also be downstepped if they occur later in the utterance following a preceding high tone; this is denoted with the '!' symbol. Table 20 below summarizes the pitch accent labels used in the labelling and analysis. See also §3.1.3 below for further discussion of prosodic words and pitch accents.

Next, I discuss the boundary tones. As background, I assume three layers of prosodic structure at or above the word, each of which by default corresponds to a particular syntactic category ("interface categories"; Selkirk 2011, Elfner 2012). The intonational phrase (ι) is the largest unit, and corresponds to the clause/CP (with illocultionary force, under Selkirk's 2011 formulation). The second highest unit is the phonological phrase (φ), corresponding to the syntactic phraes/XP. The lowest unit is the prosodic word (ω), which corresponds to the morphosyntactic word/X^0.

(2) Syntax-prosody correspondences assumed

a. CP $\leftrightarrow$ intonational phrase (ι)
b. XP $\leftrightarrow$ phonological phrase (φ)
c. X^0 $\leftrightarrow$ prosodic word (ω)

Each unit is associated with particular prosodic characteristics. The prosodic word is the domain of primary stress to which pitch accents are associated. The phonological phrase is associated with boundary tones of intermediate size (e.g. L-), as well as certain other properties, such as the lengthening of final syllables and pitch reset between phrases.

The intonational phrase is also associated with boundary tones, although the boundary tones associated with ι are usually associated with more extreme pitch events than those of φ (e.g. L%). Prosodic pause is also more likely between intonational phrases, but may occur (perhaps with less frequency or having shorter duration) at lower levels of prosodic constituency. Indeed, cross-linguistically we see that prosodic phenomena are more exaggerated at higher levels in the prosodic hierarchy. Boundary tone labelling involves the same low and high tone target symbols, but employs the '-' symbol for the "lower" phonological phrase boundary tones and the '%' symbol for intonational phrase boundary tones. Table 21 shows the boundary tone labels used in this study.

Table 20: Pitch accent labels used

Label	Description
LH*	Rising tone with prominence on H
L*H	Rising tone with prominence on L
H*	High tone
L!H*	Downstepped rising tone
!H*	Downstepped high tone

Table 21: Boundary tone labels used

Label	Description
H%	High and rising intonational phrase boundary
L%	Low and falling intonational phrase boundary
H-	High phonological phrase boundary
L-	Low phonological phrase boundary

Lastly, I will discuss the break indices. This tier of labelling indicates the level of juncture between the words and phrases in a particular utterance. Juncture is diagnosed by a number of factors, which may also be used to understand the size of the juncture itself: pause, segmental allophony, syllable duration, boundary tone, and pitch reset (Khan 2008).

As is noted above, for the present study I use break indices that invoke just three prosodic categories (as we will see, at least one category, the phonological phrase *φ*, is found to be recursive). These categories are the *prosodic word ω*, the *phonological phrase φ*, and the *intonational phrase ι*. Each of these categories is assumed to be universal, that is, accessible to all languages. As a terminological note, I point out here that in the literature on intonation within the AM framework, we often see a different suite of categories that are invoked, most notably including the accentual phrase (AP) and the intermediate phrase (ip). These categories do not inherently correspond to syntactic units, but are instead defined principally by their organization within a language's intonational phonology. That is, analysts working within intonational phonology under the AM framework will typically not use category labels such as *φ*, for instance, but instead use labels that reference specifically categories within the intonation. We can call the two labelling methods the "AM" and "interface" category labels, respectively. These are compared below in Table 22.

Table 22: AM categories (defined by intonation) vs. interface categories (defined by syntax)

AM category label	**Interface category label**
prosodic word (ω)	
accentual phrase (AP)	(minimal) phonological phrase ($\varphi_{[min]}$)
intermediate phrases (ip)	(maximal) phonological phrase ($\varphi_{[max]}$)
intonational phrase (IP, ι)	

A note on the accentual phrase (AP) is in order. In the history of research on intonational phonology, some languages have been argued not to have an accentual phrase category in their intonation, such as English; others, such as French (Jun & Fougeron 2000), Korean (Jun 2000), Japanese (Venditti 2005), and Uyghur (Major & Mayer in press) have been argued to have APs. We can say, then, that the AP is a language-specific annotational tool. On the other hand, prosodic phonologists generally concur that there are just three, universal, prosodic categories (ω φ ι) that always faithfully match their syntactic referents, unless phonological or semantic factors, countermand this. A method commonly used by prosodic phonologists, then, to account for why certain, but not other, languages have accentual phrases is to propose that APs are actually realizations of (or equivalent to) phonological phrases φ. APs, being larger than prosodic words, are often constrained by prosodic size, usually containing one lexical word. This size constraint will typically lead to a high degree of mismatch between prosodic categories and their syntactic referents. As such, prosodic phonologists, operating under an interface theory such as Match Theory, propose that in so-called "AP languages," constraints enforcing prosodic size restrictions (for one example, MAXIMUMBINARITY-φ, enforcing that phonological phrases have no more than two prosodic word daughters) are very highly ranked. In languages where there appears to be more rigid correspondence between syntactic phrases XP and a matching prosodic category, these size constraints are ranked lower than constraints enforcing syntax-prosody isomorphism, e.g. MATCH(XP, φ).

Once this is assumed, the intermediate phrase (ip) may be simply described as a recursive, maximal, phonological phrase $\varphi_{[max]}$, which dominates any lower phonological phrase/AP $\varphi_{[min]}$. Indeed, APs and ips have often been shown to be demarcated by identical events (e.g. pitch excursions), but iPs do so in a more exaggerated way. As a concrete example, in their AM model of Uyghur intonation, Major & Mayer (2020) show that what they label "AP" is demarcated by a high boundary tone (labelled 'Ha') and may be followed by a pause, whereas what they label "ip" is also demarcated by a high boundary tone (labelled 'H-'), and may be followed by a slightly longer pause.

Table 23 shows the break index labelling conventions I adopt in this study. Note relative "strength" of two phrasal boundaries are contrasted here: a (left) phonological phrase boundary, which is the locus of pitch reset, but not of a boundary tone, is "2"; a (right) phonological phrase boundary, which is marked consistently with a boundary tone, and may also have phrase-final lengthening and pause after it, is "3."[16]

Table 23: Break indices used

Label	Description
0	Word-clitic boundary
1	Word bounary
2	Left phonological phrase boundary (just reset)
3	Right phonological phrase boundary (reset, boundary tone, final lengthening)
4	Intonational phrase boundary
-	Mark indicating hesitation/elongated pause
p	Mark indicating other disfluency

2.3.2 A note on stress in Todos Santos Mam

I noted above that Mam realizes pitch accents on prominent syllables, namely stressed ones. Before discussing the results of the study, it will be important to discuss where stress falls in the language.

[16] I understand that this is a somewhat unusual convention, seeing that both "2" and "3" refer to phrase boundaries. The choice reflects the fact that L and R edges of phonological phrases in Mam are loci for distinct processes.

England (2017) notes that stress across all varieties of Mam is regular, but that all three major geographic divisions of Mam dialect clusters have different stress pattern. In Southern Mam (for example, the Cajolá variety; Pérez & Jiménez 1997), stress is regularly penultimate regardless of syllable weight. In Western Mam (for example, Tacaná Mam; Munson 1984) stress is regularly ultimate regardless of syllable weight. In Northern Mam (for example, Ixtahuacán Mam; England 1983a,b), stress is regularly assigned to the rightmost heaviest syllable; when there's no syllable, stress is regularly penultimate.

Todos Santos Mam is a Northern Mam variety whose stress pattern is essentially identical to that of Ixtahuacán Mam's, as described and analyzed by Elkins & Kuo (2023). There, we note that Todos Santos Mam has a four-way weight hierarchy, in which VV ≻ Vʔ ≻ VC ≻ V. That is to say, syllables with long vowels (VV) are the heaviest syllable type and attract stress whenever present. Next heaviest are post-glottalized vowels (Vʔ), followed by other syllables with coda consonants. Light vowels with no following coda (V) are the lightest syllable type. Refer to Chapter 2, §2.4 for more on stress in Todos Santos Mam.

(3) Todos Santos Mam weight hierarchy (Elkins & Kuo 2023, p. 1)

VV outweighs Vʔ

a.	[kuʔ.ˈwaːl]	*ku'waal*	'child'
b.	[ˈaːl.ʠ̥aʔn]	*aalq'a'n*	'robs'

Vʔ outweighs VC

c.	[ˈχɪʔ.ʈʂ̻'ɐχ]	*ji'tx'aj*	'thin person'
d.	[ʔaχ.ˈɓ̥eʔ]	*ajb'e'*	'wants'

VC outweighs V

e.	[ma.ˈsath]	*masat*	'deer'
f.	[ˈʔoχ.ʈʂ̻ɐ]	*ojtxa*	'before'

When all syllables are non-light and of equal weight, stress falls on the ultima (4). However, final light syllables never receive stress (5). If a word contains all light syllables, stress is penultimate.

(4) Stress is default rightmost if all syllables closed by non-glottal (Elkins & Kuo 2023, p. 2)

a.	[ʔaχ.ˈlaŋ]	*ajlan*	‘rests’
b.	[man.ˈmaq^{h}]	*manmaq*	‘big (of animals)’
c.	[tow.ˈsant^{h}]	*towsant*	‘Todosantero’

(5) Penultimate stress if syllables are all light (Elkins & Kuo 2023, p. 2)

a.	[ˈme.ɓ̥ɐ]	*meb’a*	‘orphan, poor one’
b.	[ˈʂ̺ɓ̥ɪ.ʠ̥ɐ]	*shb’iq’a*	‘naked’
c.	[χapaˈninɐ]	*japanina*	‘reason, meaning’

In an Optimality-theoretic framework, we argue that stress is by default ultimate, but resists falling on final light syllables; this implicates a ranking argument of NONFINALITY(μ) » ALIGN-R(σ́, *ω*). Elkins & Kuo (2023) do not report phonetic correlates of stress, but rather assume the facts concerning the Northern Mam weight hierarchy reported in England (1983a,b).

3 Results: evidence for prosodic categories

This section describes the results of the intonational study of Todos Santos Mam. It is structured in several parts. First, I present experimental evidence for three interface categories of prosodic structure in Todos Santos Mam (*ι*, *φ*, and *ω*). With this information in hand, I approach the question of whether any of the experimental conditons (that is, presence/absence of a directional and adjectival modification) had an influence on prosodic phrasing of Mam VS(O) sentences.

Here, I offer a top-down summary before the evidence is discussed. First, in regard to the three interface categories, we see that although *ω* is the domain of primary stress assignment, a variety of pitch accent types are realized in the intonation of *ω* depending on the prosodic shape of the word, i.e. the interaction of stress and weight within a word. For instance, we see that while certain disyllabic words with stress on a VV syllable, e.g. *tzaalaj* ‘happy’ are consistently realized with a rising L*H pitch accent, other disyllabic words such as *manim*, without any VV syllables, and with ultimate stress, are realized with LH*. The full discussion on *ω* is given in §3.1.1.

Second, *φ* is a domain whose right edges are realized with a boundary tone which is not linked to word prominence, but is rather anchored to the right phrase edge. This is usually H-, although L- may also mark the edge of *φ*. The difference between whether *φ* is marked with H- or

L-, I argue, falls out from whether φ is minimal or maximal within recursive φ-layering. (A maximal φ is simply one that dominates another φ.) Specifically, we see that minimal (or non-maximal) φ's are consistently realized with H- at their right edge, whereas maximal φ's are consistently realized with L-. This recursive layering falls out from strong isomorphism to underlying syntactic structure, which itself consists of many layered XPs. The phonological phrase φ is also the domain of downstep, with pitch reset occurring at the left edge of any φ. These two properties, pitch reset at the left edge and boundary tone at the right edge, help argue for recursive φ structure. Specifically, we see pitch reset, but not a boundary tone, at the right edge of the verb in productions of both VS and VSO clauses. This means that a left φ boundary (marking the beginning of the following subject phrase) but not a right φ boundary, is observed following the verb, implicating a recursive φ structure, which can be schematized as $(\mathrm{V}\ ((\mathrm{S})_\varphi\ (\mathrm{O})_\varphi\ )_\varphi\ )_\iota$.

Last in terms of prosodic categories, I find that ι is the domain of global pitch declination. Its right edge is also demarcated by intonational boundary tones L% or H%. L% is used for declaratives, while H% is used for polar questions.

Next, I sketch the findings for prosodic weight of φ, namely whether the presence of an adjective modifying subject and object phrases played any role. We find that adjectives are incorporated isomorphically into the phonological phrases of the XPs they modify. The presence of an adjective does not cause pitch reset or adjustment in prosodic constituency. We do, however, see that prosodic constituency is distinct in intransitive (VS) compared to transitive (VSO) clauses, which was anoother experimental condition. Specifically, we see that whereas the subject XP is a maximal φ in intransitives, it is a minimal φ in transitives: this falls out directly from the absence or presense of an object, respectively: $(\mathrm{V}\ (\mathrm{S})_\varphi\ )_\iota$ *vs.* $(\mathrm{V}\ ((\mathrm{S})_\varphi\ (\mathrm{O})_\varphi\ )_\varphi\ )_\iota$.

In sum, we see that Mam's prosodic phrasing is highly isomorphic to its syntactic referent, and this holds true across experimental conditions. Section 4, which concludes this chapter, shows all possible mappings from syntax onto prosody, where each refers to a particular sentence type (experimental block) in the experiment.

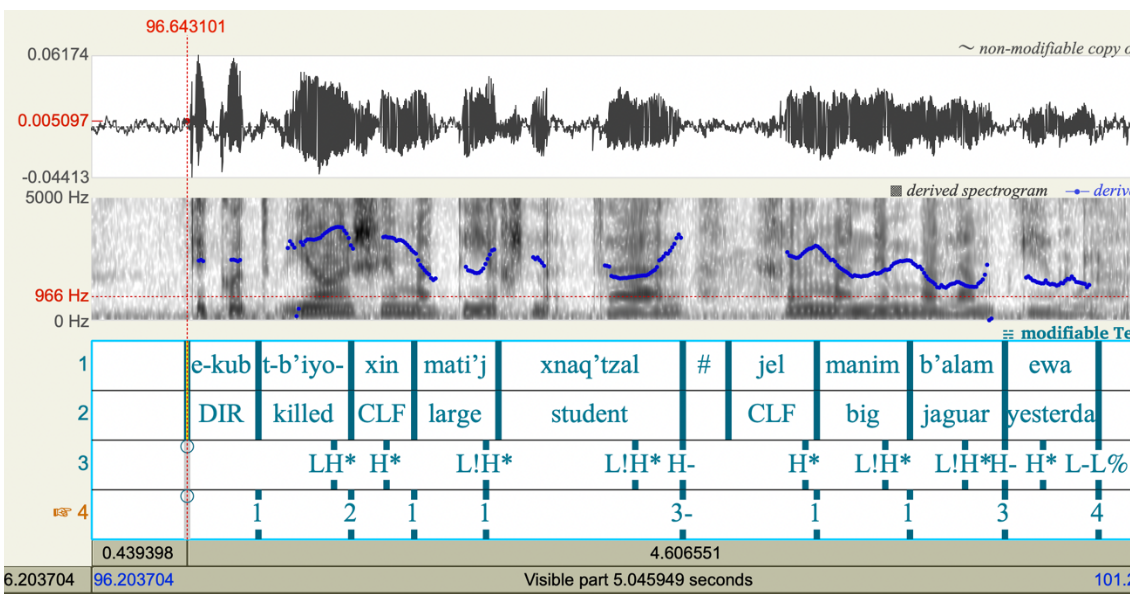
3.1 Three interface categories

3.1.1 Intonational phrase (ι)

We begin by looking at the largest prosodic constituent evidenced in the Mam clause, the intonational phrase (*ι*), which under Match Theory ideally corresponds to the clause/CP. Indeed, we find evidence for this constituent, based on two major criteria: the right edge is marked by a final boundary tone, and it is the domain of global pitch declination. We find that in declaratives, *ι*'s end in a boundary tone with a low pitch target (falling tone): L-L%. This is marked out by itself in Figures 2-3 below.

Figure 2: *ι*-final L-L% boundary tone

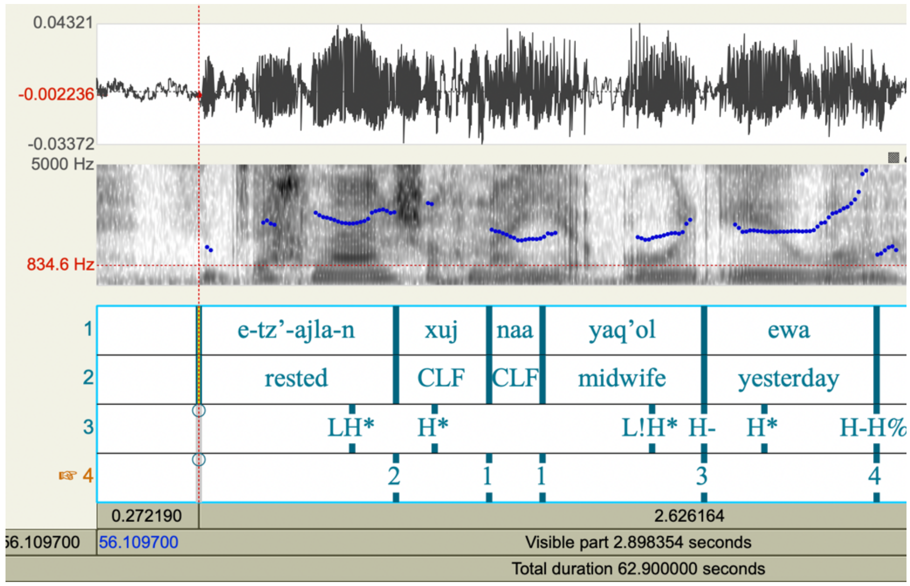
Pitch track of "The large student killed the big jaguar yesterday"



Across speakers, the majority of utterances ended in L-L%. The remaining percentage of sentences ended in a rising H-H%, an example of which is given below in Figure 3. I propose that declaratives ending in H-H% are semantic/pragmatic: they can be attributed to either listing intonation, or cases when the speaker was unsure of their performance while speaking the sentence.

Figure 3: H-H% marks edge of intonational phrase in listing intonation

Pitch track of "The midwife rested yesterday"



This experiment did not contain any interrogative sentences. However, exploratory fieldwork into question intonation in Todos Santos Mam has revealed that H-H% is the utterance-final boundary tone used in yes/no questions. More research needs to be done to show this as a consistent interrogative boundary tone, as well as the difference in intonation between Y/N and content/*wh*-questions.

3.1.2 Phonological phrase (*φ*)

Next, we look at the next-largest prosodic constituent below the intonational phrase: the phonological phrase (*φ*). Under Match Theory, *φ*'s should correspond to XPs. We find in the experimental data that the prosodic cues evidencing the phonological phrase was overall consistent, but, like for intonational phrases, subject to some variation.

First, we see that the right ends of subject DPs and *most* object DPs are demarcated by a high-rising boundary tone: H-. This is shown in Figures 4-5 below, with H- highlighted in red

Figure 4: H- marks right phonological phrase boundary

Pitch track of "The large student killed the large jaguar yesterday"

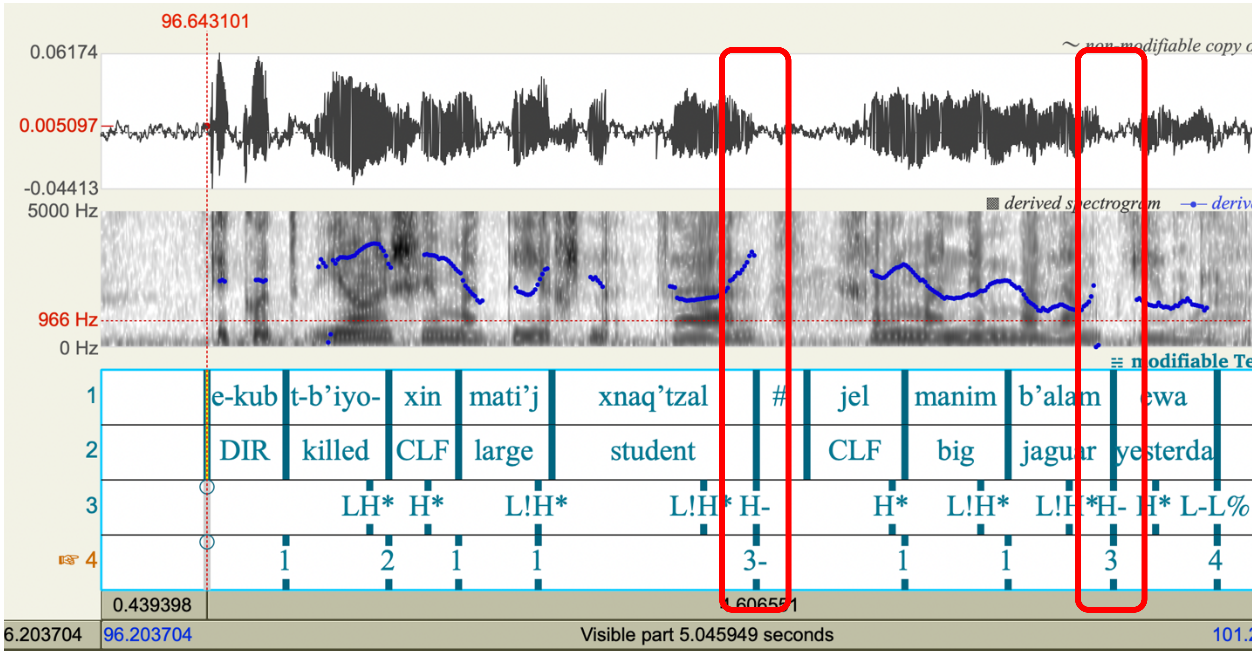
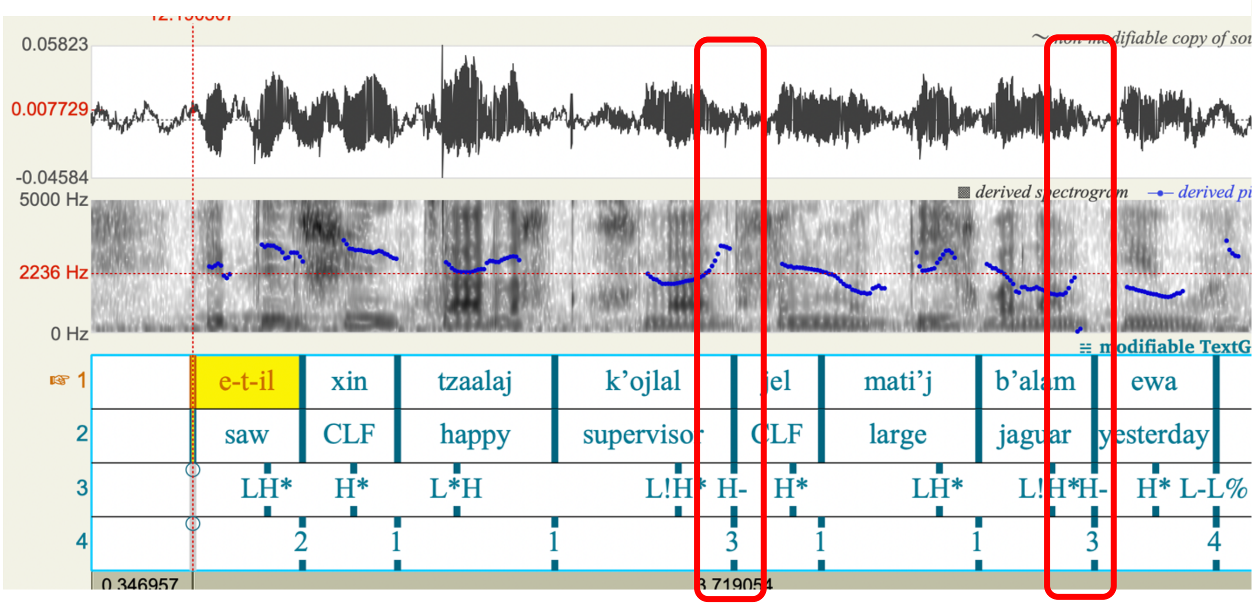


Figure 5: H- marks right phonological phrase boundary

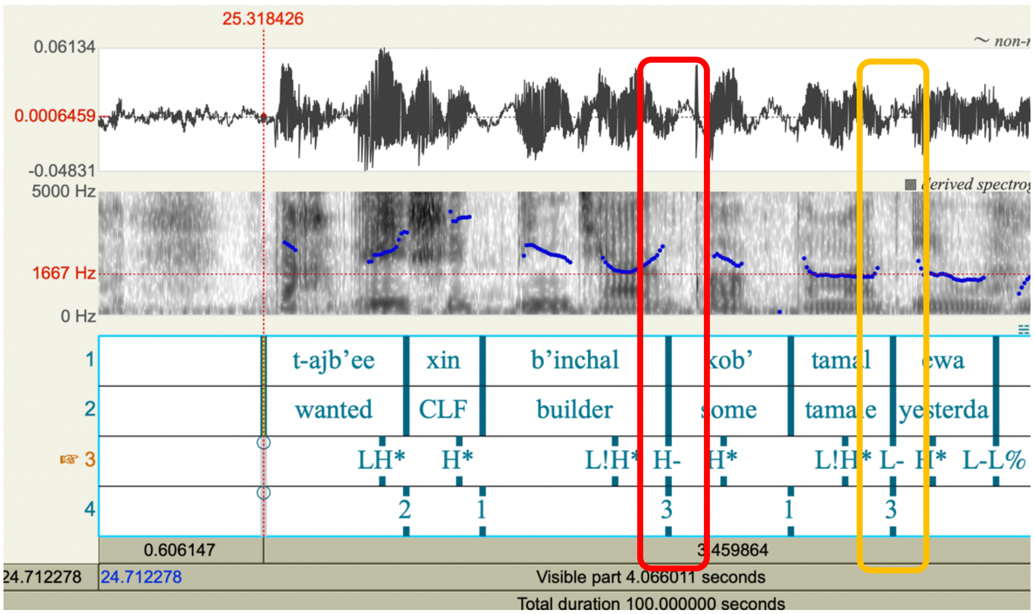
Pitch track of “The happy supervisor saw the large jaguar yesterday”



As seen above, in transitive (VSO) sentences the right edge of the object XP may be demarcated by H-. In other instances, however, it is demarcated by L-. Essentially, both rising and falling boundary tones are observed in the data. Below, H- is marked in red and L- in yellow.

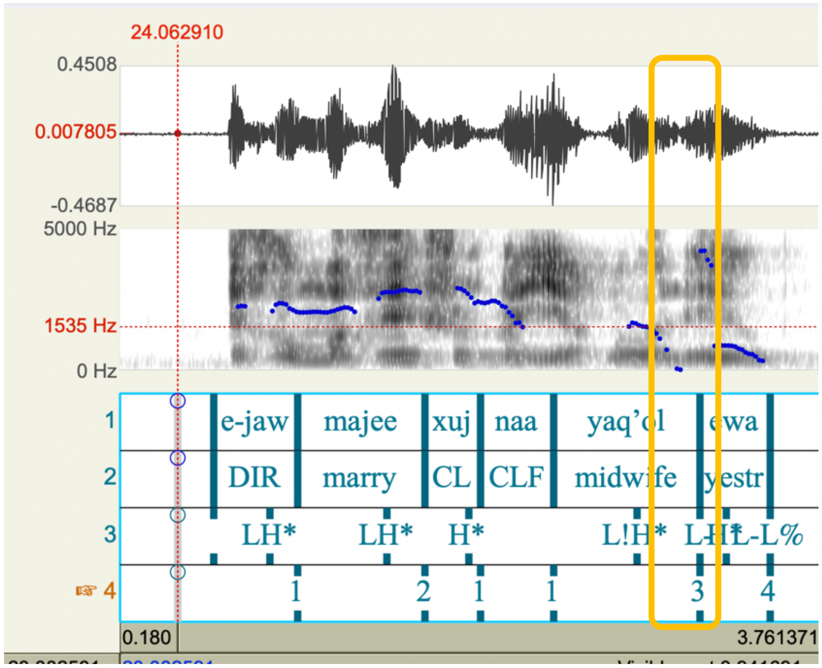
Figure 6: L- marks right edge of object XP

Pitch track of "The builder wanted some tamales yesterday"



In the data, VSO (transitive) subjects were never uttered with a final L-; within transitive clauses, this seems to be a characteristic specific to the right edges of VSO objects. Interestingly, we only see L- boundary tones on subjects often when the clause is intransitive (VS). In the following example of a Block 3 intransitive (Dir-V-S-X), we see that the subject receives a L- tone.

Figure 7: L- marks right edge of intransitive subject
Pitch track for "The midwife got married yesterday"



This observation indicates that there may be more prosodic organization in Mam sentences than simply a succession of φ's in a flat structure. Indeed, it will be argued below in §3.4 that for both subjects in VS clauses, and objects in VSO clauses, both are final within a *maximal* φ in a recursive prosodic structure. I will argue that the right edge of *maximal* φ's may receive L-, whereas the right edges of *minimal* φ's will not.

Lastly in this section, it is important to remark on the status of directionals. At the outset of this work, it was unclear if directionals in Mam functioned as mere heads (Dir^0) or were better described as phrasal. We see from the production data that directionals are never marked with a phrase-designating boundary tone at their right edge (they do trigger pitch reset, however – see §3.2.1). This indicates that directionals are mapped to prosodic words in the phonology. Seeing that Mam's prosodic structure is highly isomorphic to the source syntax, we may conclude that directionals are being mapped from syntactic termanal nodes/heads Dir^0, and not as phrases. There is independent syntactic support for this proposal as well (see Chapter 2).

3.1.3 The prosodic word (*ω*)

Finally, we may look to the level of the prosodic word, as evidenced by the distribution of pitch accents. A characteristic of Mam's pitch accents that I uncovered during the analysis is that different stress melodies (which themselves fall out from Mam's weight hierarchy for assigning stress) are consistently associated with different flavors of pitch accent in the intonation.

Recall that stress in Todos Santos Mam is regular, being assigned to the rightmost heaviest syllable within the word on the weight scale VV > Vʔ > VC > V (stress only falls on lights if a word is monosyllabic or stress would otherwise fall on a final light; see Elkins & Kuo 2023).

In the production, monosyllables uniformly received H* tone if pitch-accented. Words that were two syllables or longer exhibited variation due to the fact that stress will shift regularly depending on syllable weight, along the scale shown above. We find that for words where stress is ultimate (arising due to a heavier final syllable than previous oness), a rising LH* contour is observed, e.g. for the word *manim* 'large.' Because stress is, by default, ultimate, we can consider that the rising LH* is the pitch accent associated with a default stress pattern. When stress is not ultimate, it can be retracted either onto a VV or Vʔ to satisfy those syllables' need to be stressed. Both words with tonic Vʔ, and words with tonic VV, were realized with a rising L*H accent. Lastly, stress can also retract onto a light syllable if stress would otherwise fall on a final light, e.g. for *ewa* [ewɐ] 'yesterday.' For these, just H* is realized on the penult, perhaps because the final syllables of such words are reduced. Indeed, exploratory fieldwork in Todos Santos Mam has found that all light syllables that end lexical words uniformly have a reduced vowel as their nucleus, which I transcribe as [ɐ].

(6) Stress type–pitch accent relation

a.	Monosyllables	H*	e.g.	*xin*	'CLF'
b.	all light polysylabic	H*	e.g.	*ewa*	'yesterday'
c.	final-stressed polysyllabic	LH*	e.g.	*manim*	'big, large'
d.	heavier-lighter penult stress	L*H	e.g.	*b'a'nxix*	'excellent'
e.	VV-lighter penult stress	L*H	e.g.	*tzaalaj*	'happy'

Illustrative examples of default pitch-accent patterns in actual productions are given below in Figures 8-11. The surrounding prosodic context is not shown, but all words shown here are not *φ*-final, meaning that there is no influence of the phonological phrase boundary.

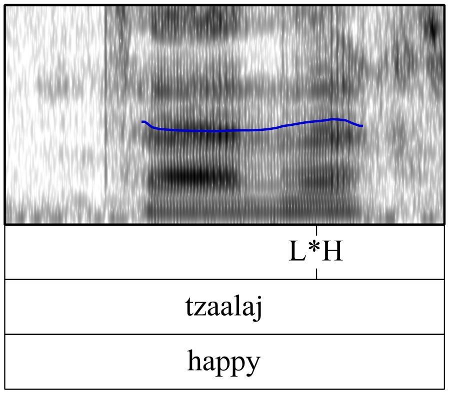


Figure 9: pitch-accented word with stressed VV penult (ex. *tzaalaj* 'happy')

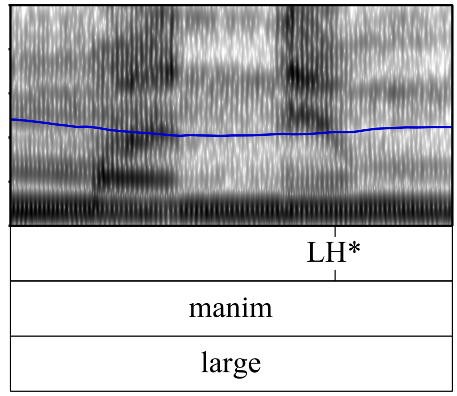


Figure 8: pitch-accented word with stressed ultima (ex. *manim* 'big, large')

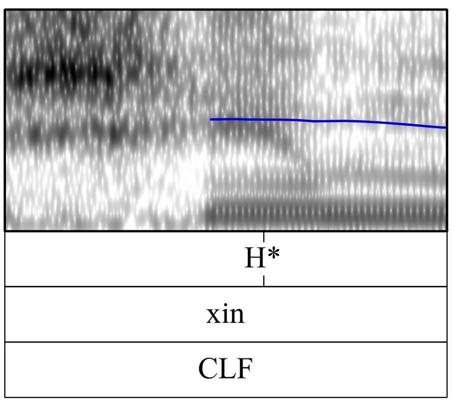


Figure 10: pitch-accented monosyllable (ex. *xin* 'CLF')

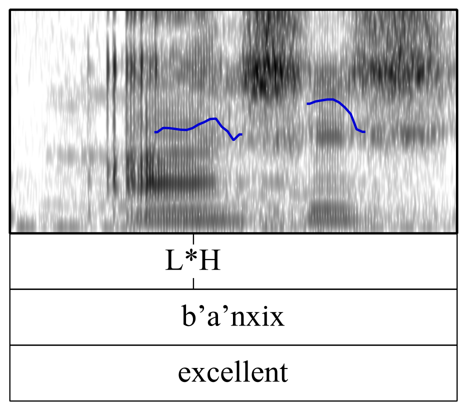
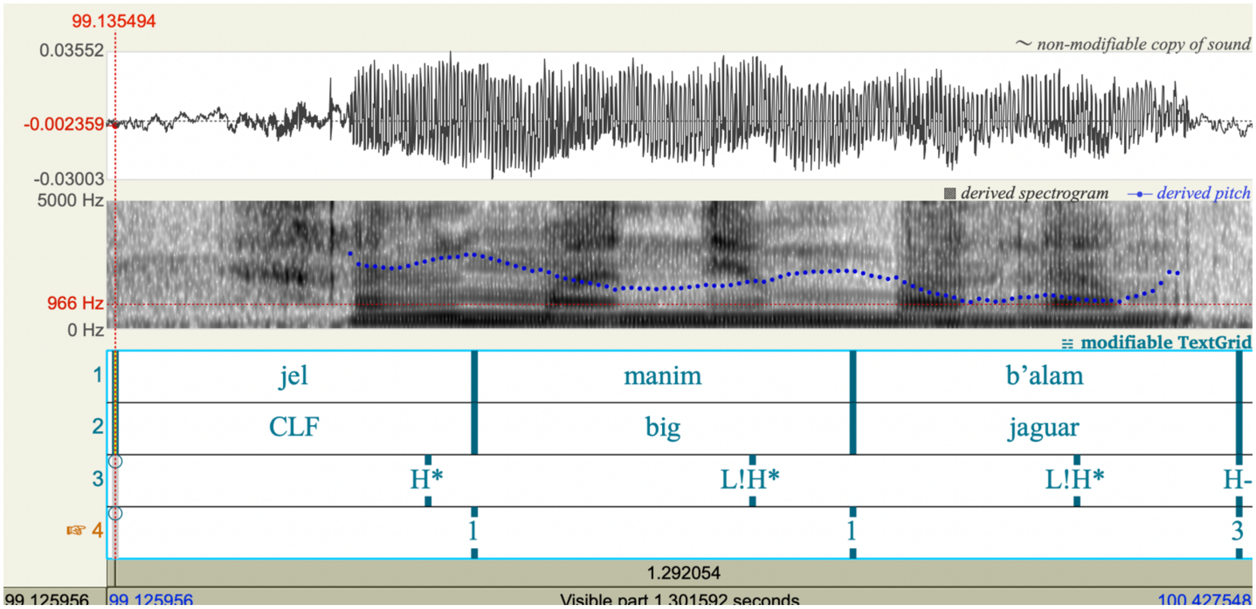


Figure 11: pitch-accented word with stressed Vʔ penult (ex. *b'a'nxix* 'excellent')

We must also note that downstepped versions of the typically-assigned pitch accent (i.e. !H*, L+!H*, or L*+!H) were observed when an accented syllable appeared after another H tone pitch accent within the phonological phrase. Pitch reset to a higher high pitch ceiling was observed at left *φ* boundaries (discussed in detail in §3.3.1). An illustrative example is given as Figure 12.

Figure 12: downstep within an XP/φ

(ex. jel manim b'alam 'the big jaguar')



3.2 Further indicators of prosodic boundary

In this section, I provide additional metrics which are used to demarcate phonological phrase boundaries. Aside from φ-final boundary tones, we can look at two more measures of prosodic constituency: downstep and pause.

3.2.1 Downstep and pitch reset

Downstep is the cross-linguistically attested phonological phenomenon by which, in a sequenceof two high tones, the second is lowered, is realized at a lower relative pitch (f_0) while still remaining phonologically high. This relatively lower high tone's pitch realization then serves as a referenethat defines the high boundary for subsequent H's throughout a given phonological domain (see Connell 2011 for an overview). The literature on downstep defines two types: "automatic downstep," in which a H tone is only lower than a preceding H when there is a linked

L tone intervening; and "proper downstep," when downstep occurs between two adjacent H's not caused by an intervening L.

Both types of downstep are predominantly used to refer to suprasegmental phenomena in tonal languages. In the literature on intonational phonology, however, "downstep" refers to the analogous phenomenon of successive pitch ceiling lowering for high-tone *pitch accent* targets, and need not be used to describe tone languages.[17] This kind of downstep – what we might call "intonational downstep" – is what I am referring to here when I refer to "downstep" in Mam intonation (Mam does not have contrastive tone).

Downstep is also contrasted with *pitch declination*, which is the global lowering (declination) of pitch throughout the course of the utterance (first observed by Pike 1945 and named by Cohen & 't Hart 1967; see also Pierrehumbert 1980; Vaissière 1983; Ladd 1993). This has been argued to be due to the physiological constraint on maintaining high sub-glottal pressure throughout the course of the utterance, but also as the result of individual pitch accents constricting the tonal space (Pierrehumbert 1980).

Global pitch declination is observed for all Mam speakers, and across all sentence types. This does not seem to be a function of prosodic phrasing *per se*. Downstep, however, does appear to co-vary with prosodic boundaries. Specifically, we see that within a phonological phrase φ, downstep applies to succeeding H targets – however, the beginning of a new φ leads to *pitch reset*, where the pitch ceiling "resets" or increases, leading to an increased pitch range. This may be observed visually as a "pitch boost" at the left edge of a new φ (see Kubozono 1989, 1993 for a similar effect in Japanese).

Pitch reset (a boost in f_0), therefore, corresponds to the left edge of a new φ, whereas the domain of downstep is within φ. We observe that pitch reset appears at a variety of consistent locations: before the verb in clauses with a directional auxiliary, and before all XPs (SubjP, ObjP if present, and final XP). This can all be taken as evidence that each of these constituents introduces a deployment of φ. Downstep appears between all pitch-accented words within φ/XP.

[17] In intonational phonology, it has also been observed that downstep is not limited to just pitch accents, but can also occur in boundary tones. In European Portuguese, Frota (2014) describes a downstepped !H% boundary tone used intonational phrase-finally after H* (e.g. H* !H% in a vocative chant). Prieto (2014) also finds that Catalan uses a downstepped rising boundary tone L!H% after a high-target pitch accent (e.g. L+H* L!H%) for an emphatic obviousness statement.

Here we examine exemplar utterances from all four blocks which indicate that pitch reset occurs at the boundaries described above. Figures 13-20 show reset throughout experimental blocks 1-4, respectively. Blue boxes draw attention to the loci of pitch reset.

Figure 13: Pitch reset (Block 1, unmodified)

Pitch track for "The student pushed the jaguar yesterday"

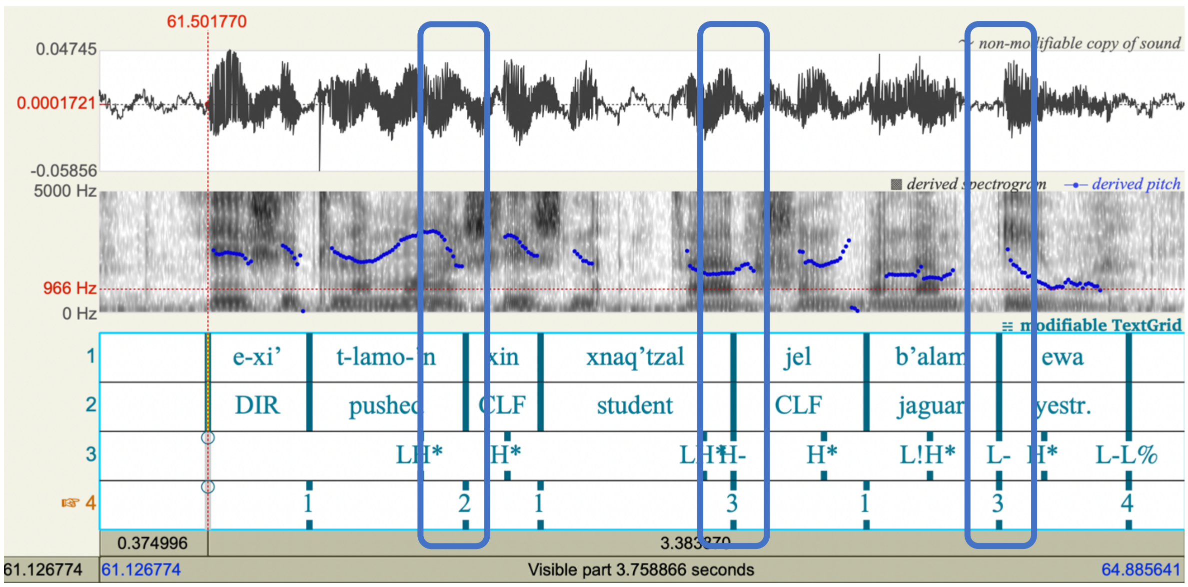


Figure 14 : Pitch reset (Block 1, modified)

Pitch track for "The large student pushed the enormous jaguar yesterday"

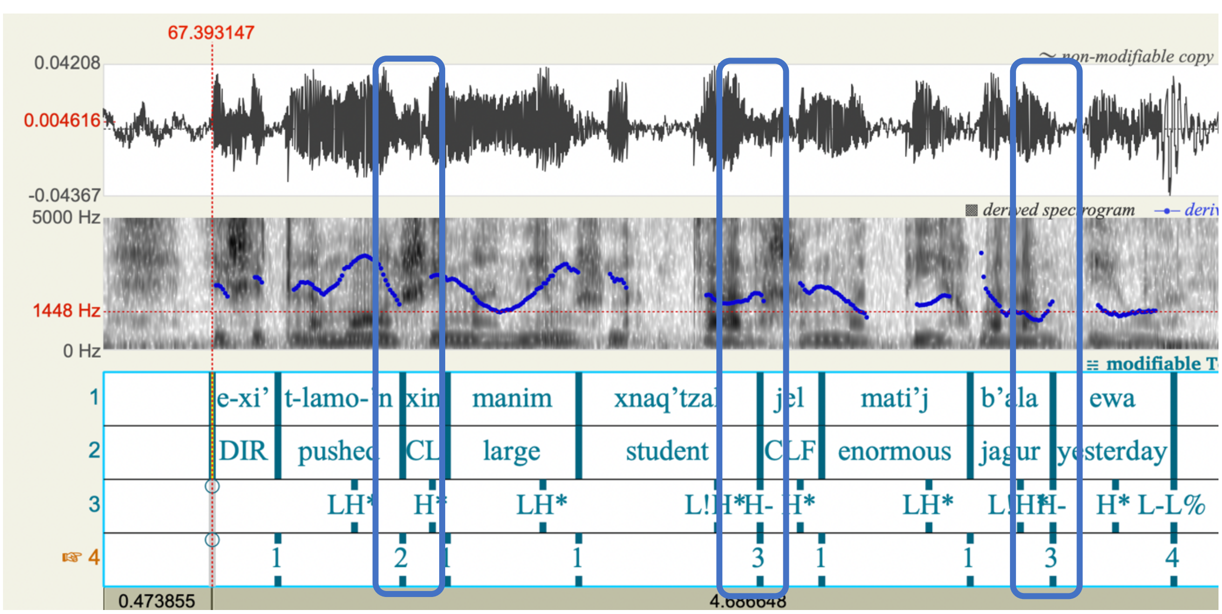


Figure 15: Pitch reset (Block 2, unmodified)

Pitch track of "The supervisor saw the jaguar yesterday"

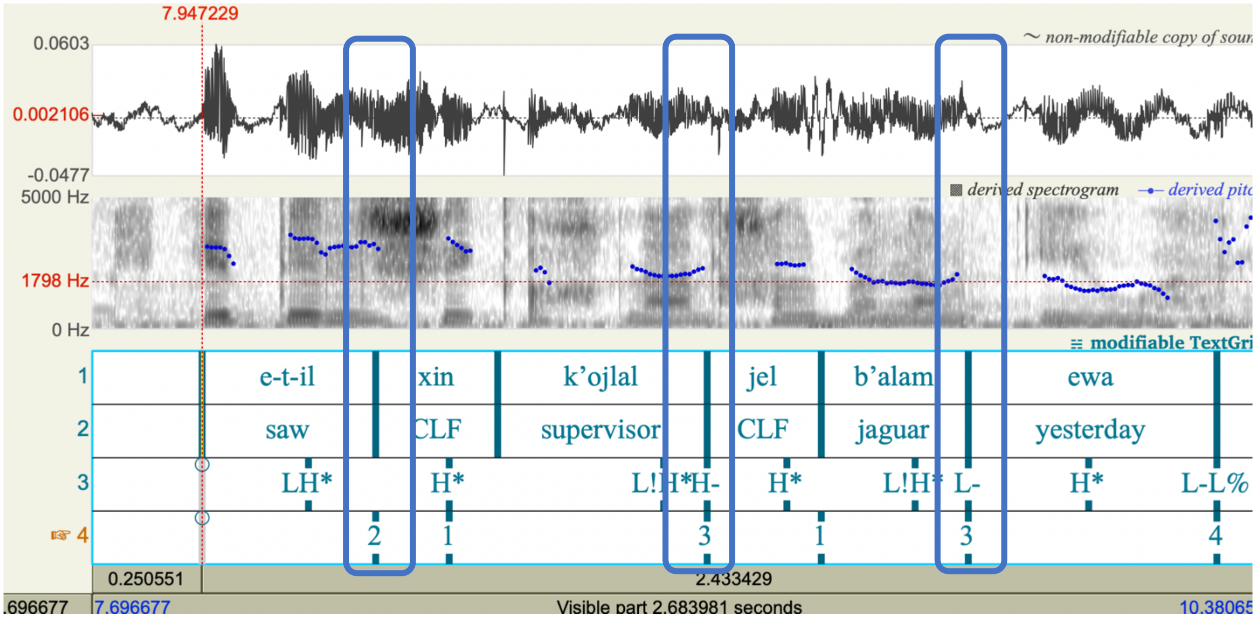


Figure 16: Pitch reset (Block 2, unmodified)

Pitch track of "The happy supervisor saw the huge jaguar yesterday"

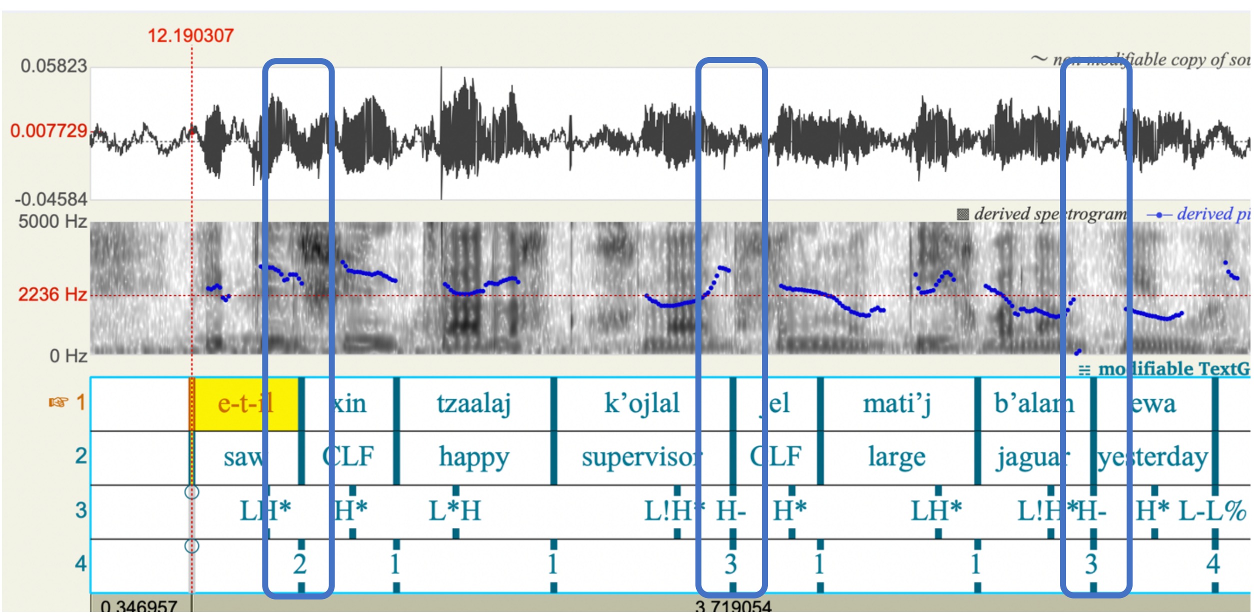


Figure 17: Pitch reset (Block 3, unmodified)

Pitch track for "The builder fainted yesterday"

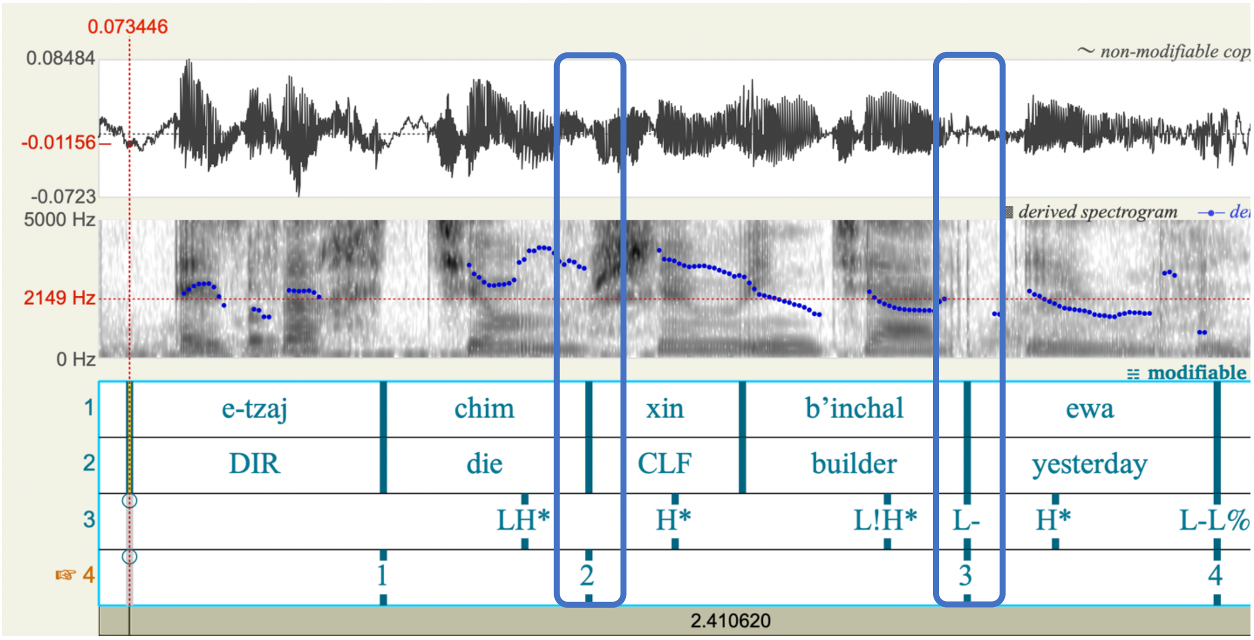


Figure 18: Pitch reset (Block 3, unmodified)

Pitch track of "The tired builder fainted yesterday"

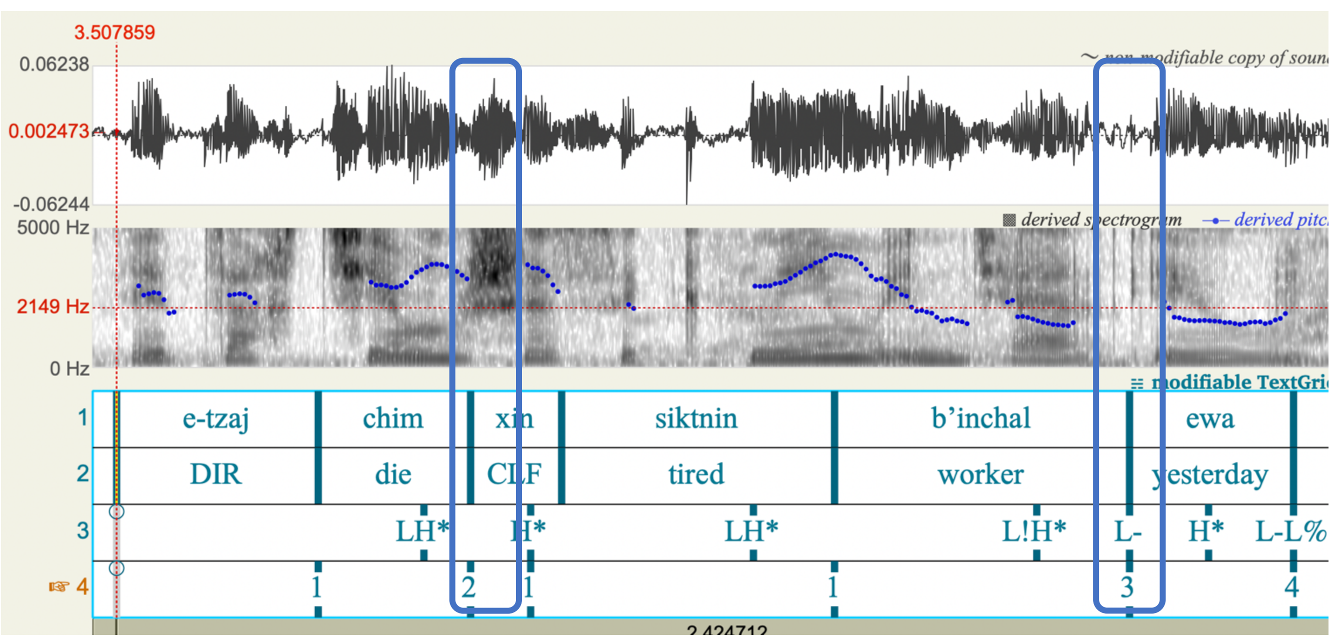


Figure 19: Pitch reset (Block 4, unmodified)

Pitch track for “The builder joked yesterday”

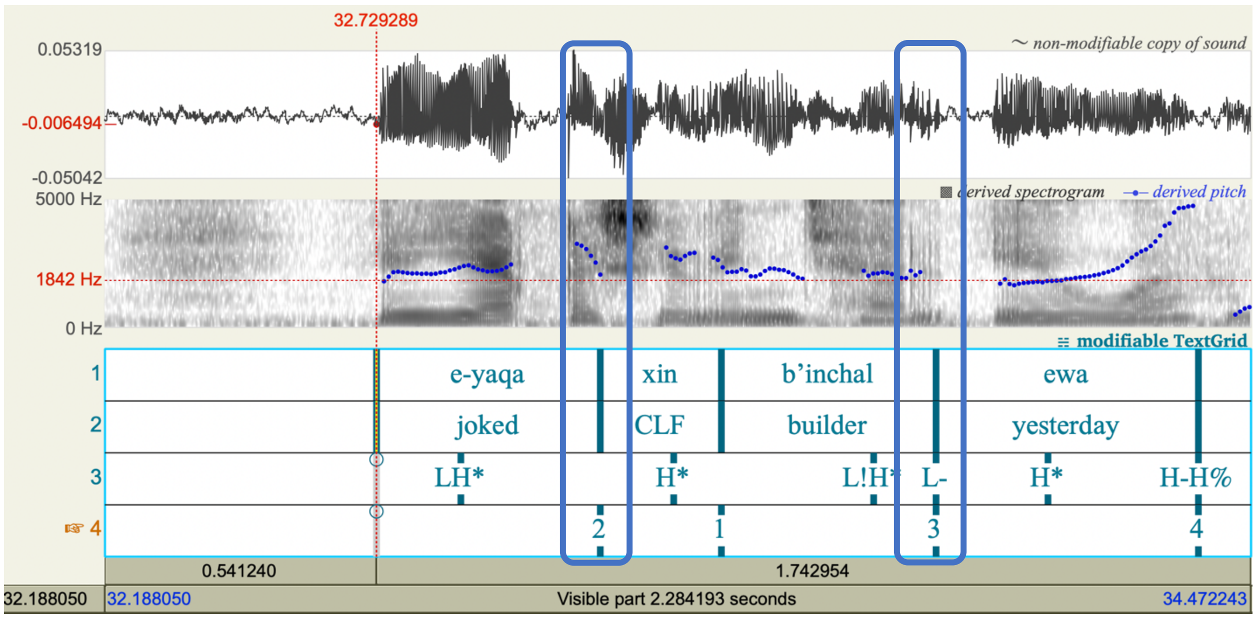
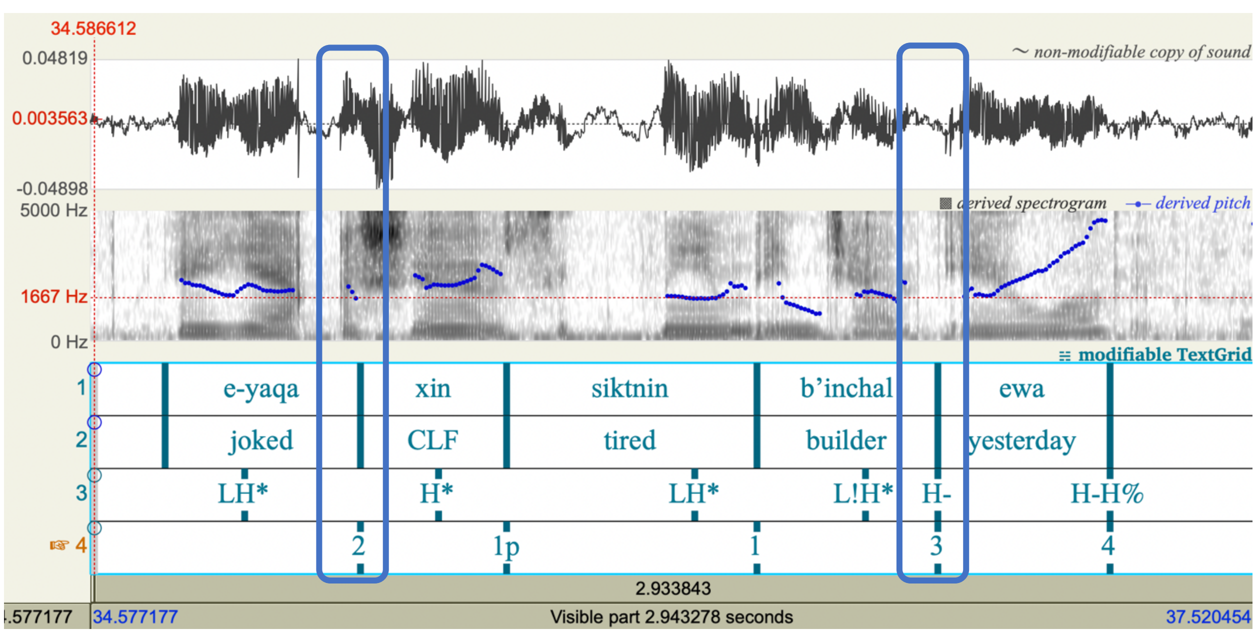


Figure 20: Pitch reset (Block 4, modified)

Pitch track for “The tired builder joked yesterday”



3.2.2 Prosodic pause

Next, I examine prosodic pause. *Prosodic pause* refers to any duration of silence found at phrase boundaries. This is a consistent pause that is noted at particular junctures, such as after a right phonological phrase boundary. Other types of pauses seen in utterance productions may include, among other things, hesitation or other disfluency, or an affected pause for a given pragmatic purpose (Sturman 2021).

Only 30 pauses were recorded in all the utternaces used in the experiment. They ranged from 116-863 *ms.*, with an average pause length of 277 *ms.* Table 24 below summarizes the distribution of pauses across speakers before various constituents, as well as their average durations at each location. In the table, "x" indicates the presence of an adjectival modifier, whereas "X" indicates the sentence-final adjunct phrase. Note that these only accounted for less than half (14/30 = 47%) of total pauses recorded – there were 16 (16/30 = 53%) more pauses that appeared elsewhere (such as after a classifier or other functional morpheme); these pauses are excluded because they are syntactically unnatural boundaries to place a pause, and therefore attributable to disfluency.

Table 24: Number and average duration of pauses at various positions

	__SubjP		__ObjP		__XP	
	#	**dur.**	#	**dur.**	#	**dur.**
VxSxOX	2	404 *ms*.	7	352 *ms*.	0	N/A
VSOX	1	526 *ms*.	2	185 *ms*.	0	N/A
VxSX	0	N/A			1	191 *ms*.
VSX	0	N/A			1	116 *ms*.
Total	***n* = 14**					
Ave	**277 *ms.***					

We find that pauses overall appeared very rarely across speakers and sentence types. When pauses appeared at all, it was not at a consistent prosodic juncture, although it was slightly more likely to occur before an object phrase than a subject phrase, and before a subject phrase than before a sentence-final adjunct. However, the pauses before the objects, despite being somewhat more common, were shorter in duration on average than the pauses before subjects (pauses were shortest on average before the final adjuncts). A 2-tailed T-Test reveals that the difference in duration between pre-S and pre-O pauses is not significant ($p = 0.124$). Therefore, we have license to view speakers' productions of pause not as a consistent prosodic phenomenon, but resulting from either prosodic planning (Myers & Hansen 2007) or disfluency (hesitation).

More evidence that this is the case is the fact that pause appeared slightly more frequently before modified XPs than unmodified XPs. Take, for example, the 7 attested pauses before ObjP in VxSxOX sentences, compared to only 2 before ObjP in VSOX sentences. Seeing that the former is heavier syntactically, the increase in likelihood of pause should be expected. However, we find that this effect is not significant, perhaps due to the small sample size ($p = 0.446$).

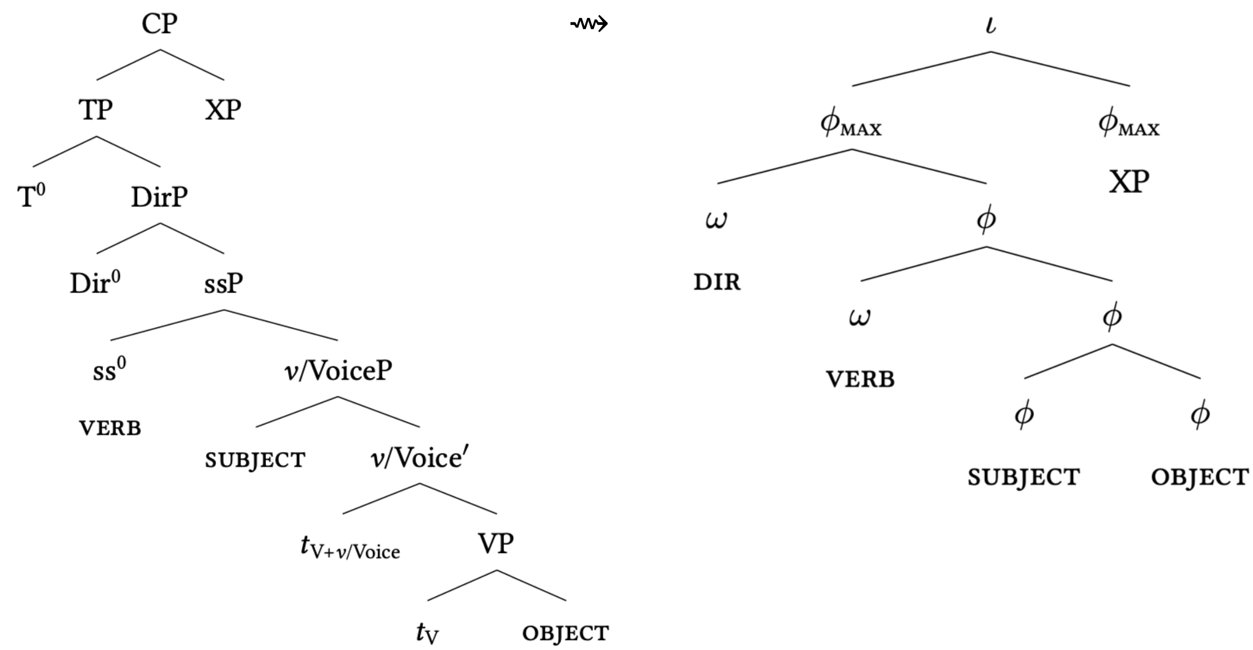
Recall that the appearance of consistent prosodic pause, which may be of particularly long duration – specifically before the object in V(x)S(x)O sentences – is a prediction of the prosodic phrasing of VSO sentences derived via right-spec syntax (Clemens & Coon 2016, Clemens 2021). I return to the implications of all findings from the production experiment in the concluding section, while noting that the findings from pause data do not provide strong evidence in favor of a right-spec syntactic derivation.

3.4 Interim summary: Proposed prosodic structure of Mam clauses

I argue here that results of the production experiment indicate that the prosodic structure of a Mam sentence can be read directly off of its syntact referent if we assume verb raising syntax. This yields a recursive prosodic structure, as indicated by the appearance of pitch reset (an f_0) boost at the left edges of φ's. The A examples in (7)-(10) to follow show the syntactic structures, whereas the B examples show the prosodic mapping. (For explanatory ease, each tree shows a structure in which XPs are unmodified: we return to the structure of modified XPs later.) Following Clemens & Coon (2018), I use the '⇝' symbol to mean "maps onto." I assume (following my own conclusions concerning adjuncts in Todos Santos Mam from Chapter 3, §2.4), that clausal adjuncts that occur in final position have been extraposed to a rightward peripheral position.

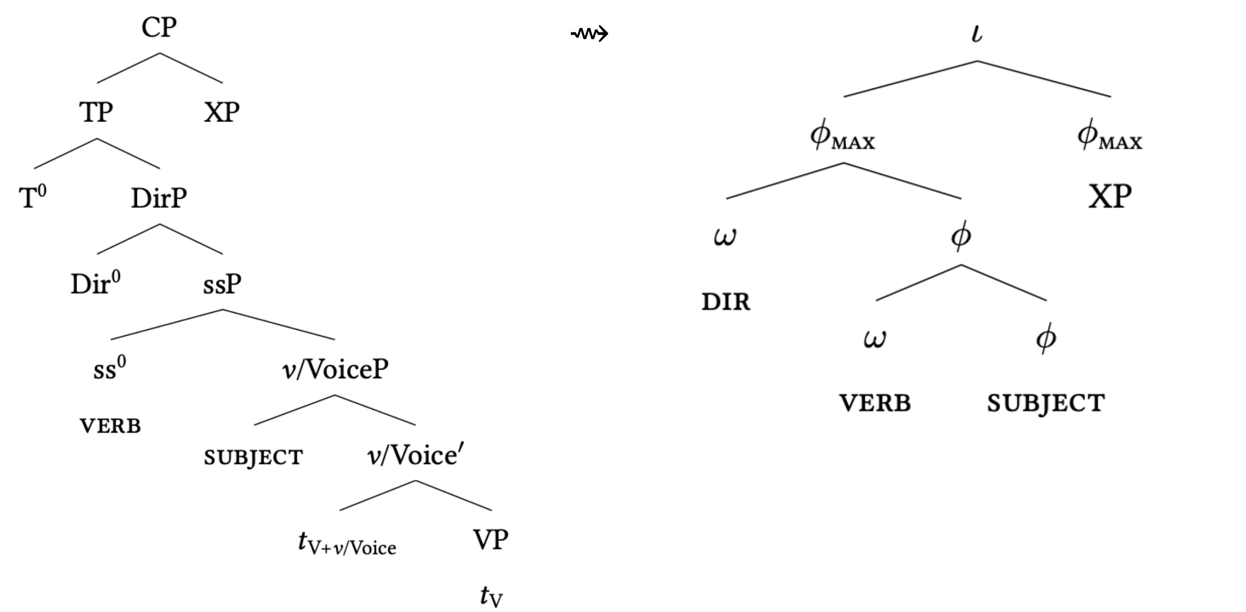
(7) Mam syntax-prosody mapping: DVSO/Block 1 (unmodified)

a. Syntax b. Prosody



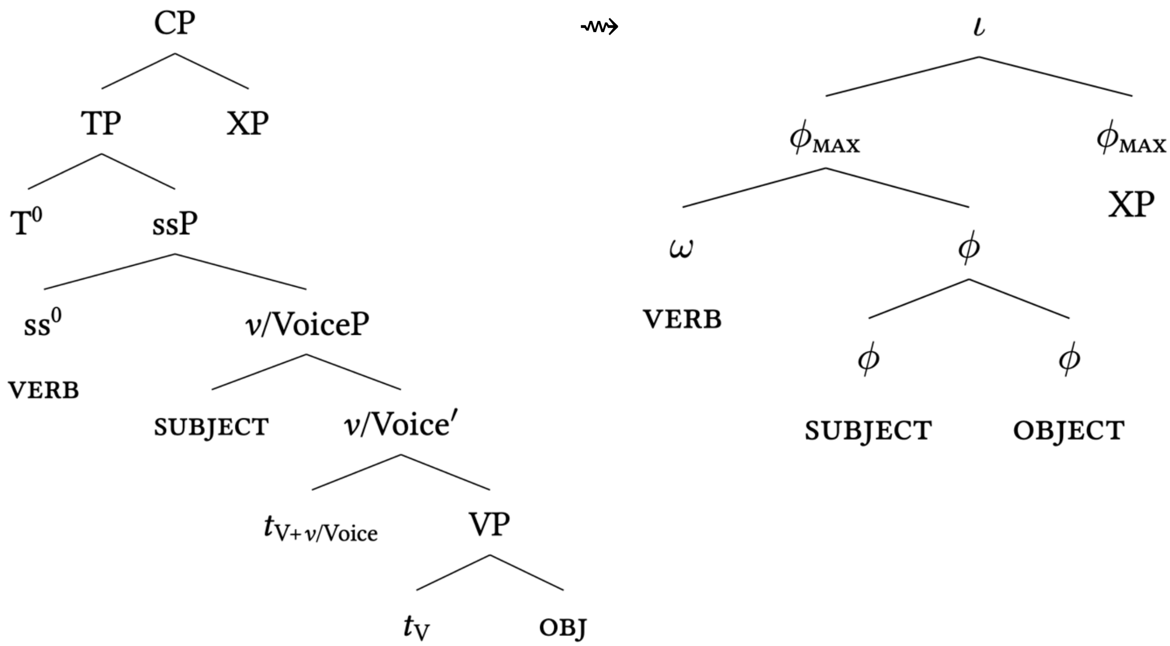
(8) Mam syntax-prosody mapping: DirVS/Block 3 (unmodified)

a. Syntax b. Prosody



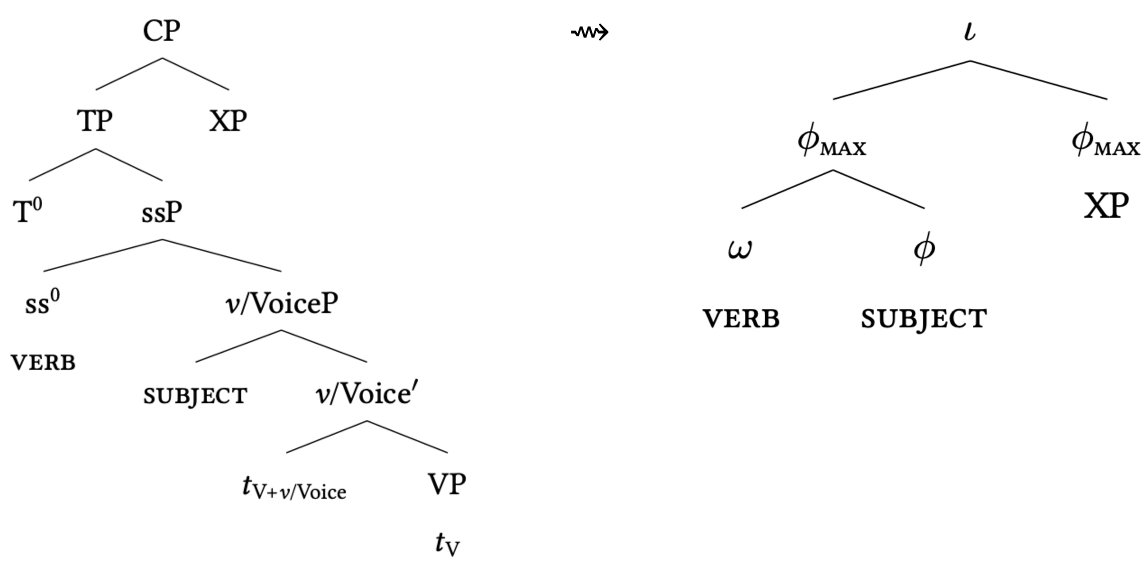
(9) Mam syntax-prosody mapping: VSO/Block 2 (unmodified)

a. Syntax b. Prosody



(10) Mam syntax-prosody mapping: VS/Block 4 (unmodified)

a. Syntax b. Prosody



A number of things are notable about the above prosodic structures. First, all nodes are binary-branching (this is explained in §4 below by the high ranking of a maximal prosodic binarity constrant). This accounts for the fact that pitch reset is observed at the left edge of every φ. Next, both directional and verb are mapped as ω, daughter of φ. This represents their prosodic structure as non-phrasal; H-/L- boundary tones are not possible at the right edges of these elements.

Next, it will be noted that in transitive clauses, the object phrase is right-most within a maximal φ, as is the sentence-final adjunct XP. In intransitive clauses, the subject phrase is within a maximal φ, as there is no object. Recall that we see an L- phrasal tone at the right edges of intransitive subjects, transitive objects, and all XPs. I argue that it is precisely these constituents, whose right edge coincides with the right edge of a maximal φ, which can be realized with a final L-. The B examples in (7)-(10) above illustraste this.

3.4.1 The status of adjectives

It will be noticed that the inclusion of adjectival modification did not affect the distribution of prosodic boundaries. Nor did we see adjectives being phrased into their own φ, but rather within the same φ as the DPs they modify. This is evidenced by the fact that there was downstep consistently observed between an adjective's pitch accent and the following noun's, nor were there boundary tones separating the two. This fact raises the question as to the syntactic structure of modified DPs in Mam, and perhaps other Mayan languages, which I remark on briefly here.

Adjectives are known to be relatively little-used in Mayan languages, and Mayan languages additionally have a relatively small number of adjectival roots: Terrence Kaufman (as a personal communication reported in England 2004) estimated a class of around 50 roots, although England (2004) argues that they are difficult to contrast with the class of positional roots. Regardless, due to the relative lack of usage of adjectives in Mayan languages, very little has been reported about their syntactic structure. Within prosodic phonology, the treatment of adjectives has also been the subject of differential treatment. Due to the fact that they are functional, rather than lexical, XPs, it has often been assumed, following the *Lexical Category Condition* (LCC; Truckenbrodt 1999), that AdjPs are not visible to the syntax-prosody mapping algorithm.

(11) Lexical Category Condition (LCC: Truckenbrodt 1999, p. 224)

Constraints relating syntactic and prosodic categories apply to lexical syntactic elements and their projections, *but not to functional elements and their projections*, or to empty syntactic elements and their projections.

While it is possible to imagine that functional elements and their projections should be visible to the mapping algorithm, we see cross-linguistically that they behave unexpectedly; specifically, they are phrased prosodically as if their nature as phrases is ignored. Tyler (2019) reports that much work within Match Theory has adopted the idea of the LCC by framing their mapping constraints as applying only to lexical, rather than functional projections (that is, XPs headed by overt lexical words), as the following mapping definitions from some recent work show.

(12) Some definitions of mapping constraints ignoring functional projections (compiled by Tyler 2019, p. 6)

a. Weir (2012, p. 111)
The edges of a *lexical* word [...] are mapped to the edges of a Prosodic Word (ω).

b. Elfner (2012, p. 241)
[A]ssign one violation for every *lexical* word in the syntactic component that does not stand in a correspondence relation with a prosodic word in the phonological component.

c. Bennett et al. (2015, p. 34)
Phonological words correspond to heads of syntactic phrases – *verbs, nouns, adjectives*, and so on, the basic building blocks of the syntactic system.

Much other work has shown that an adoption of a ban on functionally, as well ass or null-headed, XPs being mapped to prosodic categories is too stringent (see, e.g., Elfner 2012 on small clauses and null-headed DPs in Irish; Price et al. 1991; Fougeron & Keating 1997; Féry & Truckenbrodt 2005; Wagner 2005, 2010; Féry 2010; Kentner & Féry 2013 on coordinated clauses cross-linguistically). Tyler (2019) rejects the LCC, and argues that functional categories have dedicated prosodic subcategorization frames (Inkelas 1989, Inkelas & Zec 1990, Zec 2005; Bennett et al. 2018), the satisfaction of which is a phonological constraint that competes with mapping constraints like MATCH which indiscriminately map lexical and functional categories.

Regardless, if we consider the fact that adjectives phrase prosodically as heads, then this constitutes a case of mismatch, where $[_{DP}\ [_{AdjP}\ A][_{N}\ N\ ]\ ] \rightsquigarrow (A\ N)_{\varphi}$ and not $*((A)_{\varphi}\ N)_{\varphi}$. However, we may also invoke an approach along the lines of Lamarche (1991) or Laezlinger (2005), who argue that (at least certain kinds of) adjectives project along the DP spine, and are not actually adjuncts. In this case, there is no mismatch, since $[_{DP}\ [_{XP}\ A\ [_{N}\ N\ ]]] \rightsquigarrow (A\ N)_{\varphi}$. Any of the approaches (the LCC approach, the subcategorization approach, or the syntactic approach) satisfies the observed fact in the present data on Mam that adjectives do not pattern like other phrases, and I do not attempt to adjudicate between these approaches here, as more data on adjectives in Mam is required.

To summarize, then, prosodic structure's ability to mirror its syntactic referent (in its recursion and binary-branchingness) helps us to account for the distribution of different intonational events in the Mam data. The case of adjectives may, depending on the syntactic or interface account of AdjPs, constitute the only observed mismatch (although I leave this question for future research). In §4 below, I discuss how we can account for Mam's prosodic structure in an Optimality-theoretic framework.

4 OT analysis

4.1 Analysis: Match Theory

We have determined that the following prosodic structures are seen in Mam verb-initial clauses of various configurations, as evidenced by pitch events, downstep domains, and the distribution of pause. This prosodic constituency is what would be expected of a verb-raising language (with directionals as pre-verbal X^0 heads) which maps isomorphically to prosodic structure.

(13) Prosodic constituency of various verb-initial sentences in Mam

a.	Transitives with directionals:	$(Dir\ (V\ ((S)_{\varphi}\ (O)_{\varphi}\ )_{\varphi}\ )_{\varphi}\ )_{\varphi}$	Block 1
b.	Transitives without directionaals:	$(V\ ((S)_{\varphi}\ (O)_{\varphi}\ )_{\varphi}\ )_{\varphi}$	Block 2
c.	Intransitives with directionals:	$(Dir\ (V\ (S)_{\varphi}\ )_{\varphi}\ )_{\varphi}$	Block 3
d.	Intransitives without directionals:	$(V\ (S)_{\varphi}\ )_{\varphi}$	Block 4

In order to facilitate a prosodic analysis, I implemented the SPOT tool ("Syntax-Prosody in Optimality Theory"; Bellik et al. 2016). SPOT is a JavaScript application that allows the user to create a syntax-prosody analysis within Optimality Theory. The user inputs a given syntactic structure or set of structures, and calibrates the constraint set to contain only the relevant mapping and prosodic wellformedness constraints. The SPOT app then generates an exhaustive list of languages which can be generated given that input and constraint set (CON).

SPOT generates every possible prosodic tree (the entire candidate set) given a pre-selected UR and CON (essentially the app works as an automatic GEN). Per Kalivoda (2018), this set of prosodic trees defines an *OT system* S_X = (GEN_X, CON_X). SPOT performs the calculations automatically, vastly increasing the user's empirical coverage and analytical rigor. The output of SPOT is a set of all candidates and their respective violation profiles for the given constraint set, which can be fed into a separate evaluation tool for analysis. The evaluation tool I used to analyze this OT system was the OT-Help program (Staubs et al. 2010). OT-Help is a user-hosted JavaScript application that reads in an OT tableau and generates the candidate rankings for each input in GEN. Together, these two programs allow the user to create a typology of languages/prosodic profiles which are generable given a particular syntactic input and constraint set.

The first point of order is to generate a set of universal constraints which constitutes the CON for the OT system. These constraints fall into two types (mapping and prosodic wellformedness). The wellformedness constraints may be additionally subdivided into sets of constraint evaluation the particular type of wellformedness they evaluate: prosodic sisterhood and prosodic branching (daughterhood). The set of constraints and their definitions are listed below. All constraints are well accepted in the literature on the syntax-prosody interface; I have not added any of my own constraints.

(14) Constraints invoked in the present analysis

<u>*Mapping*</u>

a. MATCH(XP, φ)
Assign one violation for each syntactic phrase XP whose left and right edges are not coterminous with those of a phonological phrase φ (Selkirk 2011).

b. MATCH(φ, XP)
Assign one violation for each phonological phrase φ whose left and right edges are not coterminous with those of a syntactic phrase XP (Selkirk 2011).

Prosodic sisterhood

c. EQUALSISTERS (EQSIS)
Assign one violation for each phonological phrase φ which has two or more daughters which are not members of the same rank in the Prosodic Hierarchy (Myrberg 2013).

d. STRONGSTART (SS)
Assign one violation for each φ in the prosodic tree whose leftmost daughter is ω, such that it is lower on the Prosodic Hierarchy than its sister constituent immediately to its right (Elfner 2012).

Prosodic branching

e. MAXIMUM BINARITY-φ (BINMAX)
Assign one violation for each phonological phrases φ which has more than two daughter nodes (Itô & Mester 1992).

f. MINIMUM BINARITY-φ (BINMIN)
Assign one violation for each phonological phrases φ which has fewer than two daughter nodes (Itô & Mester 1992).

I input the four syntactic trees corresponding to the sentence types in each of the 4 blocks in the production experiment, for which SPOT generated the possible generable languages. This served as our GEN for the analysis. Then, using OT-Help as EVAL, I calculated which candidates are possible optima (winners in the OT competition) given our GEN and CON.

OT-Help realized a single constraint ranking that achieved each of the desired outcomes which were attested in the production experiment. That is, a single ranking argument can be implemented to uniquely select all desired optimal candidates, regardless of clause type/experimental block. This is given in (15) below.

(15) Constraint ranking for syntax-prosody mapping in Mam
MATCH(φ,XP), MATCH(XP,φ), BINMAX » BINMIN, EQSIS, SS

This ranking shows us a handful of important features regarding syntax-prosody mapping in Mam. First, the two MATCH constraints, driving isomorphism between syntax and prosody, are undominated. This is to be expected, seeing that there are no instances where prosodic phrasing evidences φ domains distinct from what would be expected from the syntax. Second, the prosodic binarity constraint BINMAX outranks its cousin constraint BINMIN; this shows that prosodic branchingness of intermediate φ nodes is optimally binary, which is common cross-linguistically and also reflects the binarity of branchingness of the syntax. Lastly, the remaiming two constraints – EQSIS and SS – are lowly ranked: the former aims to balance the prosodic category of daughters, meaning that mappings such as (V $(S)_{\varphi}$ $)_{\varphi}$, which is the correct structure for certain of Mam's intransitives, would be ruled out; the latter would militate against an initial verb not phrasing as its own φ – such a setup is seen in other verb-initial languages such as Niuean (Clemens 2014a,b), Ch'ol (Clemens & Coon 2016, 2018) and Mandar (Brodkin 2023).

4.1.1 Ranking arguments

Here, I show tableaux explaining the ranking established in (15) by OT-Help. We will begin from the least complex sentence type (intransitives with no directional/block 4) and build up to greater complexity.

For intransitives without directionals, SPOT generated 4 logically possible candidates, of which (16a) wins because it satisfies all mapping constraints.

(16) Block 4 syntax-prosody mapping

[$_{SSP}$ V [$_{vP}$ [$_{DP}$ SubjP]]]	MATCH(XP)	MATCH(φ)	BINMAX	BINMIN	EQSIS	SS
a. ☞ (V (S))				*	*	*
b. ((V) (S))		*!		**		
c. ((V) S)	*!*	*		*	*	
d. (V S)	*!*					

For intransitives with directionals (Block 3), there are 23 possible candidates in GEN. In (17) below, we see the winning candidate (17a) with some competitors; all candidates besides that in (17a) violate at least one mapping constraint, and therefore immediately lose.

(17) Block 3 syntax-prosody mapping

[$_{DirP}$ Dir [$_{SSP}$ V [$_{vP}$ [$_{DP}$ SubjP]]]	MATCH(XP)	MATCH(φ)	BINMAX	BINMIN	EQSIS	SS
a. ☞ (Dir (V (S)))				*	**	**
b. ((Dir V) (S))	*!	*	*			
c. (Dir (V S))	*!*				*	*
d. ((Dir) (V (S)))		*!		**	*	*

Moving on to transitive clauses now, we may examine Block 2, where the transitive verb did not have an accompanying directional. Because of the same number of constituents as in Block 3, SPOT generated 23 possible candidates for GEN. Like in previous mappings, only the winning candidate (18a), satisfies all mapping constraints; all other candidates violate at least one.

(18) Block 2 syntax-proody mapping

[$_{SSP}$ V [$_{vP}$ [$_{DP}$ SubjP] [$_{DP}$ ObjP]]]	MATCH(XP)	MATCH(φ)	BINMAX	BINMIN	EQSIS	SS
a. ☞ (V ((S) (O)))				**	*	*
b. ((V) ((S) (O)))		*!		***		
c. ((V (S)) (O)))	*!	*		**	*	*
d. (V S O)	*!**		*			

Finally we discuss the most complex clause type: transitive clauses with an accompanying directional (Block 1). For this mapping, SPOT generated 175 possible candidates, of which only one, given as (19a), is the optima. Like in the other tableaux above, (19a) is the only candidate which fails to violate the two mapping constraints; all competitors violate one or the other.

(19) Block 1 syntax-prosody mapping

[$_{DirP}$ Dir [$_{SSP}$ verb [$_{vP}$ [$_{DP}$ Subj] [$_{VP}$ [$_{DP}$ Obj]]]]]	M(φ)	M(XP)	BINMAX	BINMIN	EQSIS	SS
a. ☞ (Dir (V ((S) (O))))				**	**	**
b. (Dir V ((S) (O)))		*!	*	**	*	
c. ((Dir V) ((S) (O)))	*!	*		**		
d. (Dir V S O)	*!***		*			

To locally summarize, all winning prosodic structures, mapped from all 4 underlying syntactic structures from the experiment, are generable under Match Theory using a single constraint ranking (15). This is a highly desirable result, and shows that this ranking is present in the Mam phonological grammar for mapping syntax onto prosody. The winning candidates are those which are entirely isomorphic to their syntactic referents, which is achieved by ranking mapping constraints above prosodic wellformedness constraints. Unlike other verb-initial languages that have been described in the literature (e.g. like Ch'ol, Niuean, and Mandar), we do not see the verb "promoting" to a φ; instead, STRONGSTART is ranked low, and therefore does not drive this type of mismatch.

4.1.2 Factorial prosodic typology

Next, we can see to what degree our Match system overgenerates, that is, allows other sets of optima to be outputs under another ranking. To answer this question, I conducted a factorial typology, given the constraint set and the 4 syntactic inputs from the analysis. The output of this factorial typology will essentially be the list of other possible languages Mam *could* have been, if the constraints were reranked and a single constraint ranking held across all syntactic structures. One of these language, Mam itself, will by necessity also be one of the generable languages.

My factorial typology reveals 12 possible languages/output patterns, of which Language 1 is the attested language. That is, 11 other languages are generable given the same constraint set, but none are matches for the Mam data. Instead, these other languages can be read as logically possible outcomes that could exist given the same syntax but a different mapping algorithm onto the prosody. (Note that two outputs joined with "&" indicates co-optima.) In Table 2 below, Mam (Language 1) is highlighted.

Table 25: Prosodic typology (Match Theory); attested pattern highlighted

	Block 4	Block 3	Block 2	Block 1
Language 1	(V (S))	(Dir (V (S)))	(V ((S) (O)))	(Dir (V ((S) (O))))
Language 2	(V S)	(Dir (V S))	(V ((S) (O)))	(Dir (V ((S) (O))))
Language 3	(V S)	(Dir V S)	(V S O)	(Dir V S O)
Language 4	(V S)	(Dir V S)	(V S O)	((Dir V) (S O))
Language 5	(V S)	(Dir V S)	(V S O)	(Dir V (S O))
Language 6	(V S)	((Dir V) (S))	((V S) (O)) & ((V) (S O))	(((Dir V) (S O))
Language 7	(V S)	((Dir V) S)	((V S) O)	((Dir V) (S O))
Language 8	(V S)	(Dir V (S))	(V S (O))	(Dir V ((S) (O)))
Language 9	(V S)	((Dir V) (S))	((V) ((S) (O)))	((Dir V) ((S) (O)))
Language 10	(V S)	(Dir (V S))	(V (S O))	((Dir V) (S O))
Language 11	(V S)	(Dir (V S))	(V (S O))	(Dir (V (S O)))
Language 12	((V) (S))	((Dir) ((V) (S)))	((V) ((S) (O)))	((Dir) ((V) ((S) (O))))

Looking ahead, we find that this Match-theoretic system is highly desirable: not only is it able to correctly generate the observed optima for all four Mam sentence types, it also minimally overgenerates. A theory comparison to follow in §4.2 compares the outcomes of a Match system with Align/Wrap theory, which I ultimately conclude is inferior.

4.2 Comparison with Align/Wrap Theory

A point of order at this stage in the analysis is theory comparison: we saw above that Match Theory provided a straightforward account of Mam prosodic phrasing, but could similar results be obtained within Align/Wrap Theory, which uses a different set of mapping constraints? An additional point in favor of Match Theory as a superior general theory of the syntax-prosody interface would be if Align/Wrap were unable to account for the Mam facts.

In order to answer this question, I inputted the following asymmetric mapping constraints into SPOT in lieu of the symmetrical Match-theoretic constraints defined above in (14). The same prosodic wellformedness constraints from (14) are also used. The constraints in (20) are those typically invoked in S-P mapping analyses couched within Align/Wrap Theory.

(20) Align/Wrap-theoretic mapping constraints invoked in the theory comparison

a. ALIGN-L(XP, φ)
Assign one violation for each node of category XP in the syntactic tree whose **left edge** is not aligned with the **left edge** of a node of category φ in the prosodic tree.

b. ALIGN-R(XP,φ)
Assign one violation for each node of category XP in the syntactic tree whose **right edge** is not aligned with the **right edge** of a node of category φ in the prosodic tree.

c. WRAP(XP)
Assign one violation for each node of category XP in the syntactic tree that does not have corresponding φ in the prosodic tree, where φ contains all the terminals dominated by XP.

SPOT generates the same number of possible prosodic trees for all 4 sentence types. However, the desired optimal candidates are *not* generable using Align/Wrap-theoretic constraints. We see that, in a factorial typology, 18 languages are generable; however, none reflects the prosodic structure of Mam. The closest language generable under Align/Wrap Theory is one in which the grammar is unable to adjudicate between several co-optima for two of the four syntactic structures; the (co-)optima for each experimentala block are shown below in (21).

(21) Align/Wrap: Language 1 of 18

a. Block 1: (Dir (V ((S) (O)))) & ((Dir (V (S))) (O)) & (Dir ((V (S)) (O)))
b. Block 2: (V ((S) (O))) & ((V (S)) (O))
c. Block 3: (Dir (V (S)))
d. Block 4: (V (S))

The reason for the appearance of these co-optima is that several candidates tie on critical constraints, which was not the case under the Match-theoretic analysis. These ties are shown as tableaux in (22)-(23) below, for Block 1 and Block 2 ties, respectively. We see that all co-optima tie on the prosodic wellformedness constraints, not the Align (mapping) constraints.

(22) Block 1: three co-optima (Align/Wrap)

[$_{\text{DirP}}$ Dir [$_{\text{SSP}}$ verb [$_{v\text{P}}$ [$_{\text{DP}}$ Subj] [$_{\text{VP}}$ [$_{\text{DP}}$ Obj]]]]]	ALIGN-L	ALIGN-R	BINMIN	EQSIS	SS
a. ☞ (Dir (V ((S) (O))))			**	**	**
b. ☞ ((Dir (V (S))) (O))			**	**	**
c. ☞ (Dir ((V (S)) (O)))			**	**	**

(23) Block 2: two co-optima (Align/Wrap)

[[$_{\text{SSP}}$ V [$_{v\text{P}}$ [$_{\text{DP}}$ SubjP] [$_{\text{DP}}$ ObjP]]]	ALIGN-L	ALIGN-R	BINMIN	EQSIS	SS
a. ☞ ((V ((S) (O)))			*	*	*
b. ☞ ((V (S)) (O))			*	*	*

This co-optima issue arose under a theory of syntax-prosody mapping that uses asymmetric mapping constraints (ALIGN-L/R). Align/Wrap theory is not only asymmetric in that it aligns just one edge of some constituent to that same edge of a different constituent: it is additionally only a theory of mapping from syntax onto prosody, not the other way around. Match Theory, on the other hand, invokes *bidirectional* constraints – MATCH(XP,φ) and MATCH(φ, XP) – that map constituents from either module onto the other. If we augment Align/Wrap theory with a set of prosody-syntax mapping constraints, is the co-optima problem alleviated?

Prosody-syntax Align/Wrap constraints, being theoretically possible, are able to be implemented by SPOT. These, which are simply added to the previous constraint set, are defined below in (24).

(24) Align/Wrap-theoretic mapping constraints (P-S)

a. ALIGN-L(φ, XP)
AOV for each node of category φ in the prosodic tree whose **left edge** is not aligned with the **left edge** of a node of category XP in the syntactic tree.

b. ALIGN-L(φ, XP)
AOV for each node of category φ in the prosodic tree whose **right edge** is not aligned with the **right edge** of a node of category XP in the syntactic tree.

c. WRAP(φ)[18]
AOV for each node of category φ in the prosodic tree that does not have corresponding XP in the syntactic tree, where XP contains all the terminals dominated by φ.

The resultant factorial typology of this augmented grammar, however, is similarly disappointing. The addition of the three constraints in (24) resulted in the exact same co-optima problem. Of the 18 Align/Wrap grammars that are generable, we find that the first language, while correctly generating the prosody attested in Blocks 3 and 4, yields co-optima for Blocks 1 and 2. These are precisely those which are seen in (21) above – as such, the addition of the P-S Align/Wrap constraints yielded no improvement.

To briefly summarize this section, I aimed to compare the theoretical predictions of Match Theroy with Align/Wrap Theory. That is, can either of these theories of the syntax-prosody mapping be considered superior based on its ability to account for the Mam facts, while minimally overgenerating? We saw in §4.1 that the components of Match Theory straightforwardly predict the attested prosodic constituency of Mam clauses of various types. Here, however, we saw that Align/Wrap Theory encounters two issues to which Match Theory is not susceptible. First, and most critically, Align/Wrap Theory was unable to generate the Mam phrasings. The one language/system that came closest in a prosodic factorial typology of an Align/Wrap OT system was unable to adjudicate between co-optima for half of the clause types. In this way, it is less explanatory as a theory than Match Theory. Second, the incorporation of more constraints (two sets of asymmetric ALIGN constraints, with the addition of WRAP, versus just two symmetric MATCH constraints) leads to more overgeneration – that is, more unattested languages are potential outputs of the phonological grammar. A language like Mam, which often has more clausal complexity than other well-documented verb-initial languages, provides evidence that Match Theory is a suitable theory of the interface.

[18] This constraint, mapping from prosody onto syntax, is not given in the original work on Align/Wrap theory by Truckenbrodt (1995, 1999), but is a logical possibility which is implementable in SPOT. I have included it here for completeness.

5 Conclusions

This chapter set out to investigate a number of questions concerning Mam prosodic phrasing. First, we were able to identify how a variety of sentence types phrase in the intonation. We found that despite the different types of sentences, all were highly isomorphic to their syntactic referents. The inclusion of a directional auxiliary within the verbal complex, as well as the presence or absence of an adjectival modifier for DPs, did not induce any syntax-prosody mismatch. Thus, Mam is a verb-initial language in which verbal material does not “promote” to phonological phrase status in order to satisfy prosodic wellformedness constraints on equality of sisterhood and/or prosodic category of a left-most daughter; in this way, Mam is more akin to verb-initial languages such as Irish and Tagalog than it is to verb-initial languages like Ch’ol, Niuean, or Mandar.

In the following chapter, I consider the different classes of prosodic structures VSO languages may fall into; that is, I examine which possible mapping from syntax onto prosody are attested, and ultimately possible, for VSO languages. We see that Mam’s similarity to certain, but not other, VSO languages puts it in a common class with them, whereas other VSO languages pattern together in unique classes.

CHAPTER 5

A typology of VSO syntax-prosody

1 Introduction and predictions

The previous two chapters of this dissertation show that much converging evidence from morphosyntax, semantics, and prosody points toward verb raising, as opposed to VP remnant raising or right-oriented specifiers, as being Mam's derivational strategy for VSO word order. The purpose of this chapter, then, is to widen the scope of VSO syntax-prosody by answer three important questions that hold across languages.

1) What are the attested prosodic structures of world VSO languages?
2) Does our theory of the syntax-prosody mapping predict all and only these attested structures?
3) If not, is a more accurate approach possible?

The answers to these questions will present us with a *prosodic typology*, a list of possible syntax-prosody mappings for a particular kind of language. In this case, we examine VSO languages, of which Mam is just one example. A similar kind of prosodic typology was undertaken for SVO languages by Dobashi (2003). Dobashi finds that, across SVO languages, only four prosodic groupings of S, V, and O are attested. No grouping of the subject and the verb to the exclusion of the object, is attested, e.g. *(S V) (O).

(1) Dobashi's typology of SVO languages (Dobashi 2003; see also Samuels 2009, Kalivoda 2018)

a.	(S) (V) (O)	French, Ewe
b.	(S) (V) ($O_{branching}$) (S) (V $O_{non\text{-}branching}$)	Italian
c.	(S) (V O)	Kimatuumbi
d.	(S) (V O) ($S_{non\text{-}branching}$ V)	Kinyambo

While Dobashi finds four possible language types for SVO, Brinkerhoff et al. (2021) report three groupings of V, S, and O in the VSO languages they surveyed. In the first (2a), all three of V, S, and O phrase independently as phonological phrases; in (2b), V and S phrase together in a phonological phrase to the exclusion of the object; and in (2c) the verb phrases as a prosodic word, where S and O are grouped into a phonological phrase. (I assume that in their notation, brackets indicate "parsed into in a maximal phonological phrase," but they do not state this explicitly.)

(2) Brinkerhoff et al. (2021)'s typology (notation from there)

a. [V] [S] [O] Ch'ol
b. [V S] [O] San Ildefonso Tultepec Otomi
c. V [S O] Irish

Kalivoda (2018) uses a an OT system couched within Match Theory to derive Dobashi's SVO typology, meaning that the languages in the typological survey match the theoretical predictions of Match Theory. A question that is not answered by Brinkerhoff et al. (2021) is if Match Theory is able to generate the observed prosodic typology of VSO languages; indeed, they leave this as an open question. Answering this question, then, is the first goal of the chapter. This goal, however, cannot be reached without undergoing a larger typological search, which is described in §2.

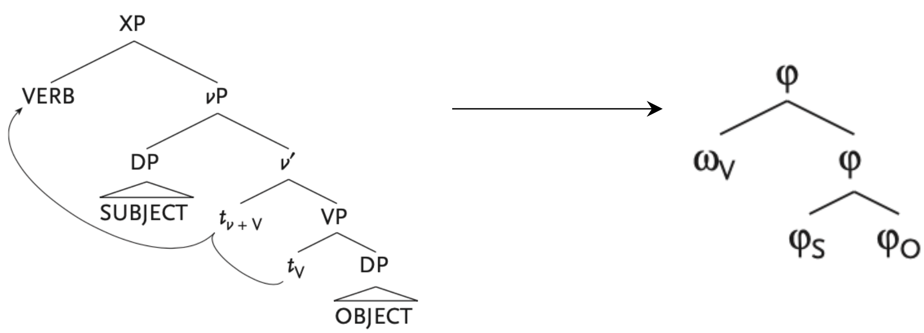
As a beginning to the investigation, we can look at the predictions for VSO syntax-prosody from Clemens (2021). In this article, Clemens describes the three potential syntactic paths to verb-initiality, and predicts what kind of prosodic structure should be expected of such languages, if we assume syntax-prosody isomorphism. These three syntactic structures should be familiar given the preceding chapters: verb raising, VP remnant raising, and right-side specifiers. Any given VSO language is therefore expected to adhere, all else being equal, to one of these structures, given below on the left of the arrow in (3).

Each of these VSO derivations, all else being equal, is expected to map onto a particular "prosodic profile" given its particular syntactic referent. This is essentially a default prosodic structure for VSO sentences with a pronounced verb, subject, and object. Per Clemens (2021), the above three syntactic structures should, given syntax-prosody isomorphism, attain the following prosodic profiles, given below at the right of the arrows in (1).

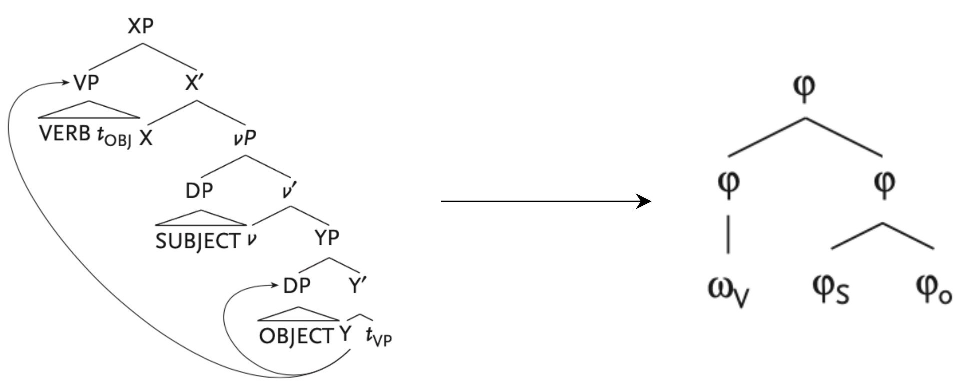
It should be noted that Clemens (2021) assumes that the highest XP in any given structure is mapped onto a φ, which is represented in the following schematizations. This is due to the fact that the highest syntactic phrase mapped on to the prosody is assumed for simplicity to be an XP, not a CP, which would be expected to map onto an intonational phrase ι.

(3) Three paths to VSO syntax and their isomorphic mappings onto prosody (Clemens 2021)

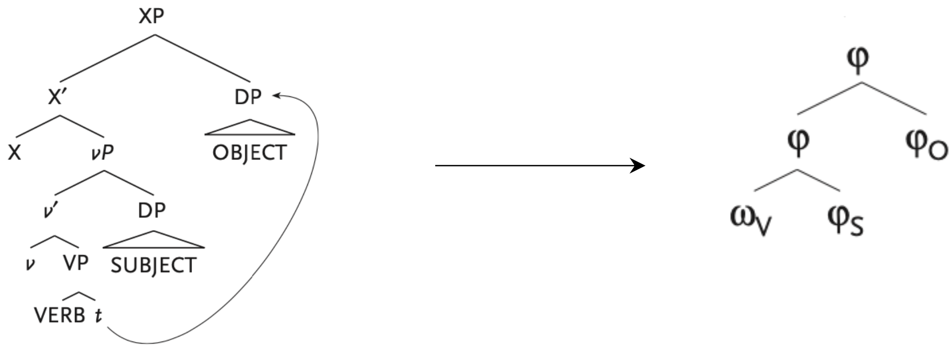
a. verb-raising



b. VP remnant raising



c. right-side specifiers



The above mapping possibilities allows us to predict that there should be at least three "classes" of language, which emerge whenever one of the three above syntactic structures is realized isomorphically in the prosody. I label these Class I, II, and III, each reflecting a particular surface prosodic profile, *not* its syntactic referent (4). I make this distinction because is theoretically possible to derive, through syntax-prosody mismatch, a particular prosodic profile from an unexpected syntactic referent. Note that these are (with some more detailed prosodic bracketings), the same as given in Brinkerhoff et al. (2021)'s list (refer to 2 above).

(4) Three classes of VSO surface prosodic structure

a. Class I: $(\mathrm{V}\ ((\mathrm{S})_{\varphi}\ (\mathrm{O})_{\varphi}\ )_{\varphi}\ )_{\varphi}$

b. Class II: $((\mathrm{V})_{\varphi}\ ((\mathrm{S})_{\varphi}\ (\mathrm{O})_{\varphi})_{\varphi}\ )_{\varphi}$

c. Class III: $((\mathrm{V}\ (\mathrm{S})_{\varphi}\ )_{\varphi}\ (\mathrm{O})_{\varphi})_{\varphi}$

The first class of VSO languages, "Class I" in my terminology (4a), is a VSO prosodic structure in which both the subject and object XPs are contained within their own prosodic phrases φ, while the verb, being just an X^0, is not mapped onto a φ, but instead simply a prosodic word ω. This is the expected prosodic profile, all else being equal, for a verb-raising language. We see that there are a series of recursive φ domains, which occur due to the recursive syntactic structure. The subject XP and object XP each constitute their own (minimal) φ's, but there is a prosodic constituent, a non-minimal φ, which contains both of these. This falls out from the fact that both subject and object XPs are dominated by a single XP node (*v*P in the schematization in 3a).

The second class of VSO languages, “Class II” (4b), is a VSO prosodic structure similar to Class I, except that each of V, S, and O, are mapped to φ. This is the expected prosodic profile, all else being equal, for a VP remnant raising language. This is because the verb phrase, being an XP, is the constituent which is fronted under that derivation. The verb, still within this XP, is therefore spelled out within a φ, like the subject and object XPs. We would therefore expect that any prosodic demarcation of a phrase would also be evidenced on the verb in a Class II language, whereas it would not be expected to be evidenced on the verb in a Class I language.

The third and final class of VSO languages, “Class III” (4c), is a VSO prosodic structure in which the object phrases outside of some constituent dominating just the verb and the subject. This is the expected prosodic profile, all else being equal, for a right-spec language. Here, we see that the verb and the subject XP phrase into a non-minimal φ, which is sisters with a minimal φ matching the object XP.

At this juncture, I should stress here that a prediction of Clemens’ (2021) account of syntax-prosody mapping is that a VSO language should *not* be able to map onto a prosodic profile distinct from these three given above unless driven to do so by extreme mismatch of syntax and prosody. We may take as a hypothesis then, that we should not find a language that has a different prosodic profile than the above Classes I, II, or III. Indeed, the only kinds of languages I found did adhere to one of these three Classes, although not each language is argued to achieve their mapping isomorphically.

2 The languages

In this section I briefly describe the languages I retrieved in my crosslinguistic typological search for VSO syntax-prosody mappings, and the methodology driving the typology.

2.1 Methodology

To conduct the typology, I collected a list of languages which are documented to be VSO by default, or to allow for VSO in particular circumstances. For admittance into the typological survey, each language also had to have been analyzed for its prosodic structure in previous literature. To the best of my knowledge, this list is exhaustive, though of course there are many VSO languages for which detailed prosodic analysis has not been undertaken or is just preliminary; these are excluded.[19] The languages discussed in this chapter are presented in Table 26 below.

Table 26: Overview of the typological search

* = VSO word order not exclusive

Class I	**Family**	**Syntactic derivation**	**Citation for class**
Connemara Irish	Celtic	head movement	Elfner (2012, 2015)
Santiago Laxopa Zapotec	Zapotecan	remnant movement[20]	Brinkerhoff et al. (2021)
Tagalog	Austronesian	head movement	Richards (2017)
Todos Santos Mam	Mayan	head movement	*current work*

Class II	**Family**	**Syntactic derivation**	**Citation for class**
Ch'ol*	Mayan	head movement	Clemens & Coon (2018)
Niuean*	Polynesian	head movement	Clemens (2014a, b)
Mandar	Austronesian	head movement	Brodkin (2023?)

Class III	**Family**	**Syntactic derivation**	**Citation for class**
San Ildefonso Tultepec Otomi*	Otomian	?	Palancar (2004)
Modern Standard Arabic*	Semitic	head movement	Alsafi (2017)

As described in §1 above, the languages collected in the present typology were expected to fall into one of three classes, given the predictions of Clemens (2021), in which there are three possible syntactic derivations of VSO that would achieve unique prosodic profiles. Indeed, we find clear evidence of Class I languages which are derived from head movement (e.g. Irish). Class II

[19] The excluded languages include Sm'algyax (Tsimshianic; Brown 2021) and Kwak'wala (Wakashan; Noguchi 2012).

[20] We will see that this analysis has been critiqued; see §2.2.3.

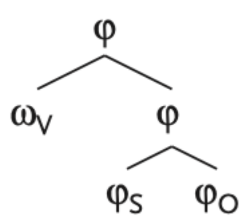
languages were also found, although in this typology all three attested Class II languages have been argued to derive their VSO word order through head movement. The set of Class III languages includes Modern Standard Arabic which has been argued to derive VSO through head movement (Soltan 2007), as well as San Ildefonso Tultepec Otomi, which does not, to present knowledge, have a syntactic analysis of word order.

2.2 Class I languages

The first class of VSO languages found in the typological survey are those in which, while the subject XP and object XP are contained within their own prosodic phrases *φ*, the verb is not matched by *φ*, but simply by a prosodic word *ω*. Only two languages have been argued to fall into this class, although others (to be described below) may be members of this class despite argumentation to the contrary.

To restate from Section 1, Class I languages, regardless of their syntactic referents, should have a prosodic structure such as in (3) below, per Clemens (2021). Individual languages of this class are described each in turn, with a discussion of how their prosodic structure maps from its proposed syntactic structure.

(5) Prosodic profile of a Class I VSO language (Clemens 2021)

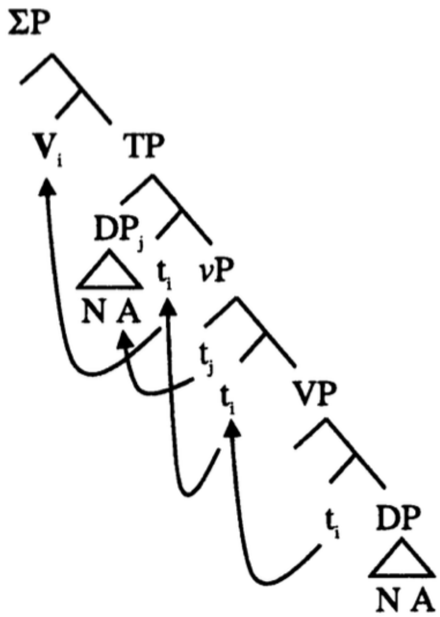


2.2.1 Connemara Irish

Connemara Irish is an exemplar of the Class I prosodic profile. Irish syntax-prosody mapping has been explored extensively by Elfner (2012, 2015).

Irish has long been argued to derive its VSO word order via serial head-movement of the verb to a position above the subject (Chung & McCloskey 1987; McCloskey 1991, 1996, *et seq.*). A schematized structure of an Irish VSO sentence is reproduced below in (4).

(6) Structure of a VSO sentence in Irish (with branching subject and object) (Elfner 2015, p. 1177)



We see in this structure that the subject DP moves to Spec,TP from its base-generated position in Spec,*v*P; the object DP stays low within the VP. To achieve verb-initial word order, the verb in Irish head-moves from V^0 to v^0 and T^0 up to a clause-initial position in Σ^0, the head of a high polarity phrase (ΣP). Culminating several decades of research, McCloskey (2011) shows that this structure is supported by much converging evidence, e.g. from coordination, focus, and ellipsis.

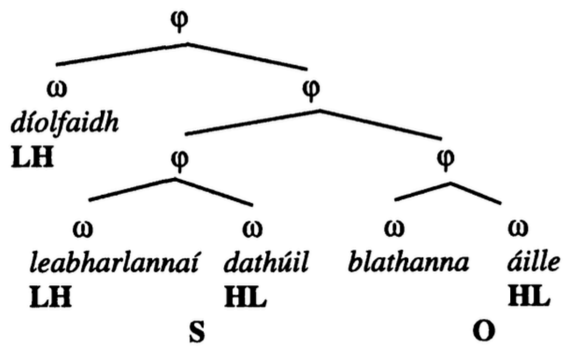
Given a strictly isomorphic mapping from the above syntactic structure onto prosodic structure, we should expect two key features of prosodic phrasing. First, the subject DP and object DP should each map to their own phonological phrases φ, and that there should be a non-minimal φ which additionally contains both those corresponding to the subject XP and the object XP. Second, the verb should phrase outside of this constituent, forming a ω on its own.

We see that both of these predictions are straightforwardly borne out. Below, take an example of the prosodic phrasing of a VSO sentence in Irish (with branching subject and object). Following a detailed analysis of the intonation, Elfner (2012, 2015) determines that words aligned with the right edge of every *φ* receive a falling pitch contour, labelled HL. Additionally, words aligned to the left edge of every *non-minimal φ* receive a rising pitch contour LH. Evidence for HL being assigned within specifically a non-minimal *φ* comes from the fact that= in VSO sentences, the left edge of a branching object XP is not assigned the rising LH pitch contour, as shown in the representation below. This is also the case of a clause-final indirect object in the presence of an immediately preceding direct object.

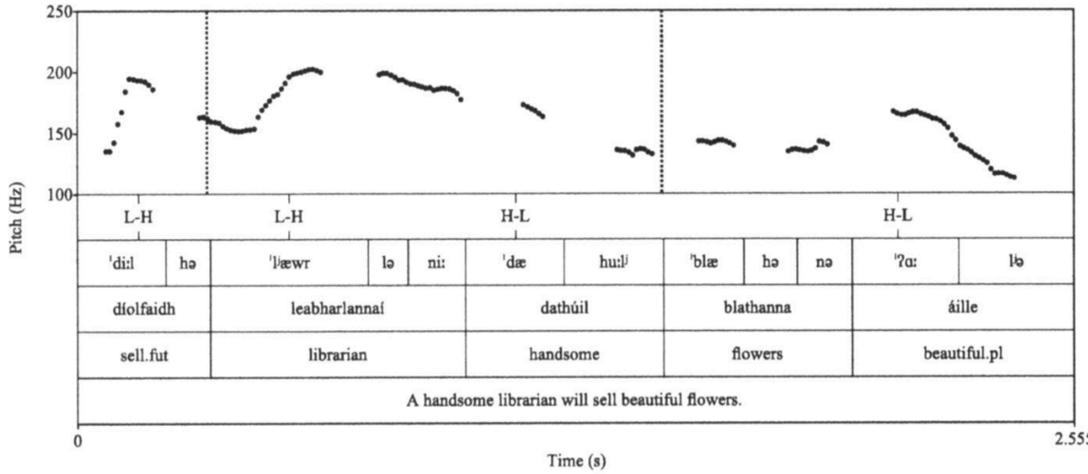
(7) Distribution of tonal events in a Connemara Irish VSO sentence (Elfner 2015, p. 1180)

a. [*V* díolfaidh [[*S* leabharlannaí dathúl] [*O* blathana áille]]]
Sell.FUT librarian handsome flowers beautiful.PL
'A handsome librarian will sell beautiful flowers'

b. Schematization of pitch events



c. Pitch track for the sentence in (7a)



We return to the prosodic patterning of VSO sentences with non-branching subjects and objects later. For now, we see that in the general case, the prosodic structure of Connemara Irish's VSO clauses matches perfectly the expected mapping from syntax onto prosody, assuming that Irish derives its verb-initiality through head-movement, as has well been established. If, for example, VP remnant raising were proposed for this language, we would expect to see the HL pitch contour assigned to the right edge of the verb (which would technically constitute a VP). This is not observed; instead, only the rising LH contour is noted on the verb, indicating that the verb phrased on its own as a ω.

2.2.1 Tagalog

Next, we look at a language with an essentially identical prosodic profile to that of Irish, namely Tagalog (Austronesian). The prosodic phrasing of this language is documented by Richards (2017).

Tagalog alternates between VSO and VOS word order, where the post-verbal arguments may be in either order due to scrambling. Unlike in languages like Ch'ol where post-verbal word order has implications for definiteness, the choice between VSO and VO word order is free.

Tagalog has “Philippine-style voice.” Within the clause, one DP is marked out to be the subject, and is case-marked by the particle *ang* (or *si* if it is a proper name). The verb, in turn, alternates morphologically based on which DP is the subject; this voice system works independently from word order alternations. In (8) below, we see VSO and VOS *actor voice* sentences, where the semantic actor/agent is the subject; in (9), we see the essentially synonymous VSO and VOS sentences in *patient voice*, where the semantic patient/object is the subject.

(8) Tagalog agent voice (Richards 2017, p. 2)

a. Lumunon ang ina ng mani
NOM.swallow ANG mother NG peanut
‘The mother swallowed a peanut’ *VSO*

b. Lumunon ng mani ang ina
NOM.swallow NG peanut ANG mother
‘The mother swallowed a peanut’ *VOS*

(9) Tagalog patient voice (Richards 2017, pp. 2-3)

a. Nilunon ng ina ang mani
ACC.swallow NG mother ANG peanut
‘The mother swallowed a peanut’ *VSO*

b. Nilunon ang mani ng ina
ACC.swallow ANG peanut NG mother
‘The mother swallowed a peanut’ *VOS*

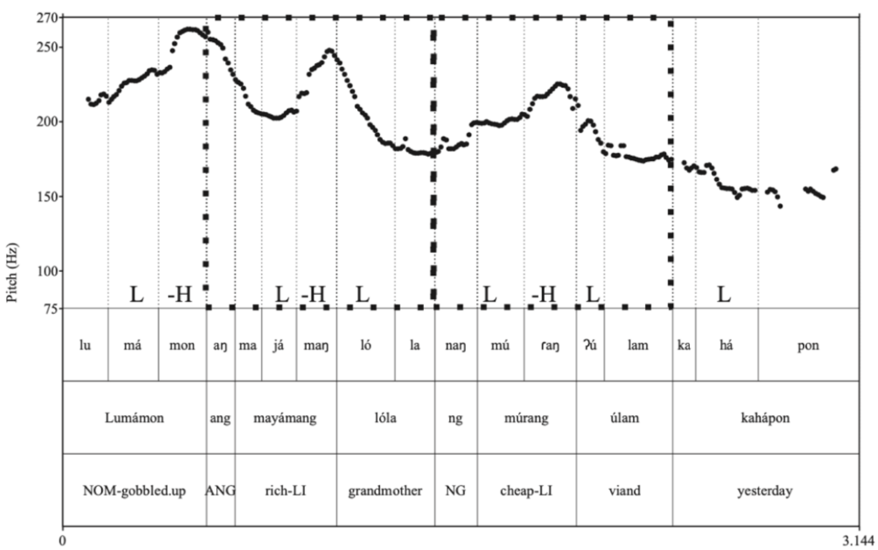
Verb-initiality in Tagalog has long been assumed to result from verb-raising (Guilfoyle et al. 1992, Aldridge 2004, Pearson 2005, Collins 2019), where the variation in the post-verbal field involves either raising-to-subject or prosodic displacement. As such, although much more variation is seen in this language compared to Irish, the core word order derivation is ultimately very similar. Strikingly, Richards (2017) finds that prosodic phrasing in Tagalog also mirrors that of Irish. In Tagalog, we see that content words are pronounced with a rising pitch accent (labelled L*+H), and the ends of XPs are associated with a content word receiving a low pitch accent (labelled L*), that is, just a pitch fall and not a subsequent pitch rise. In the pitch track below, we see that although the subject and object XPs both receive L- at their right edges, verbs just have L*+H.

(10) Prosodic phrasing of VSO (actor voice) in Tagalog (Richards 2017, p. 6)

a. L<um>amon ang mayamang lola ng murang ulam
<NOM>gobble.up ANG rich grandmother NG cheap viand

kahapon
yesterday
'The rich grandmother gobbled up the cheap viand yesterday'

b. Pitch track for (8a)



The fact that the verb only has an L*+H pitch accent and no right-aligned L- phrasal accent shows that the verb does not form its own prosodic constituent with any following material. Because Richards indicates that we see consistent pitch reset at the onset of phrases, the ideal phrasing of this language's VSO sentences is (V $((S)_{\varphi}$ $(O)_{\varphi}$ $)_{\varphi}$.

2.2.3 Santiago Laxopa Zapotec

We saw in the cases of Irish and Tagalog examples of straightforward one-to-one isomorphic mapping from syntactic structure onto prosodic structure. Irish appears to have Class I prosody in VSO sentences (with branching S and O). Another language which is argued to share Irish's prosodic profile is Santiago Laxopa Zapotec (SLZ; Brinkerhoff et al. 2021). In this language, data from downstep serves as the crucial diagnostic for Class I structure, under Brinkerhoff et al.'s

(2021) account. Before showing their prosodic analysis, it is important to note that this Zapotec language has been recently argued to achieve VSO through predicate remnant raising (Adler et al. 2018). Other Zapotec languages have also been argued to achieve VSO through remnant raising (Lee 2006 for San Lucas Quiaviní Zapotec), which has also been argued for languages within the wider geographic/family area: see, e.g. analyses of the distantly related Mixtec languages of San Juan Piñas Mixtec (Yuan 2023) and San Martín Peras Mixtec (Hedding & Yuan 2023). Some Zapotec languages, however, such as Quiegolani Zapotec (Black 1994, 2000) and Macuilitianguis Zapotec (Foreman 2006), have been argued to achieve VSO through verb-raising. We return to the question of VSO word order in SLZ following a discussion of its prosodic phrasing.

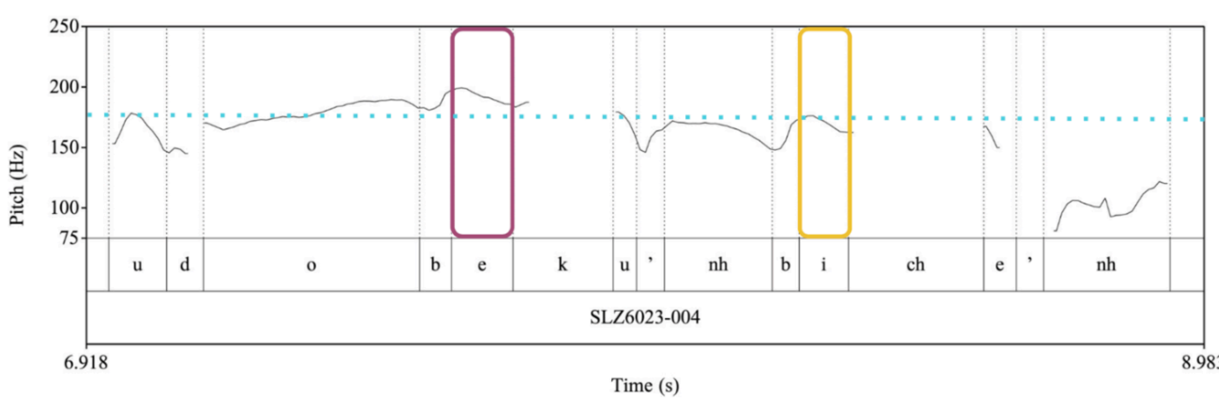
SLZ is a tonal language where downstep is observed on certain sequences of high tones (^{H}). Specifically, we see that downstep is triggered by a high tone and targets the following high tone. According to Brinkerhoff et al. (2021), downstep is bounded by prosodic structure, such that downstep may only occur within a certain prosodic domain containing the trigger, which they argue to be a *non-maximal φ*. That is, while downstep is observed between subject and object XPs, it does not hold of the entire clause; high tones on verbs cannot trigger downstep on a following subject XP.

(11) Downstep from S onto O (Brinkerhoff et al. 2021, sl. 11); purple shows H trigger, yellow shows !H target

a. | | | |
---|---|---|
Udo^{L} | **be**$^{\mathbf{H}}$ku’nh^{L} | <u>**bi**$^{\mathbf{!H}}$</u>che’nh^{L} |
ate | dog | chapulín |

‘The dog ate the chapulín’

b. Pitch track for (6a)

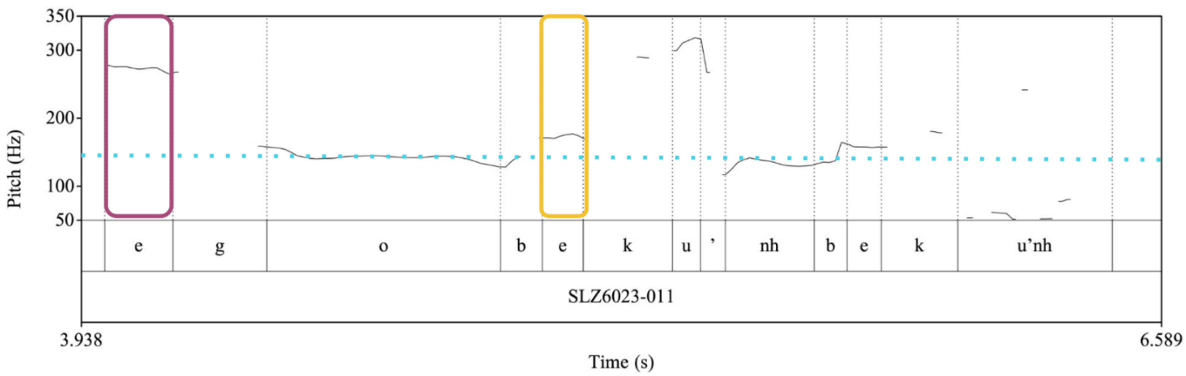


Above, downstep is observed from the H trigger on the subject *be^{H}ku'nh^{L}* 'dog' onto the H target on *bi$^{!H}$che'nh^{L}* 'chapulín.' There is no high tone on the verb. On the pitch track we see a normal high tone for this speaker being produced at ~200 Hz, whereas the downstepped high tone is consistently produced at ~175 Hz, a consistent and significant difference. This example is crucially contrasted with an example where the verb *does* have a high tone: in this instance, Brinkerhoff et al. (2021) argue that downstep does not occur from the high tone trigger on the verb onto the following high tone of the subject XP. We see this in the example below.

(12) No downstep from V onto S (Brinkerhoff et al. 2021, sl. 17); purple shows potential H trigger, yellow shows no !H

a. E^{H}go^{L} **be^{H}**ku'nh^{L} <u>**be$^{!H}$**</u>ku'nh^{L}
feed dog dog
'The dog will feed the (other) dog'

b. Pitch track for (7a)



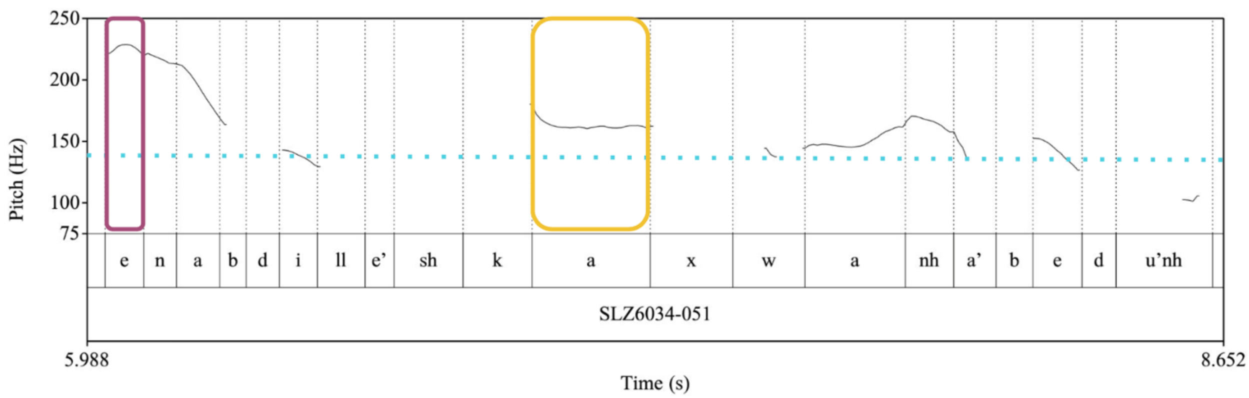
Above, we see that the high tone in the subject XP *be^{H}ku'nh^{L}* 'dog' is still produced ~200 Hz, indicating that it has not been downstepped. The pitch of the first high tone on *e^{H}go^{L}* 'ate' is particularly high (~300 Hz) because it apparently receives an utterance-initial pitch boost; the discrepancy between these two high tones is dissociable from downstep, which Brinkerhoff et al. (2021) argue does not occur between V and S in this example.

The above example shows that the verb is separated from the downstep domain. Relatedly, we also find that high tones earlier within verbs do not trigger downstep on later ones within the same *ω*, indicating that individual *ω*'s are not downstep domains. This is seen when (particularly long) verbs have several high tones, as shown below.

(13) H tones in V doesn't trigger downstep for later H tones in V (Brinkerhoff 2021, sl. 19); purple shows potential H trigger, yellow shows no !H

a. **E**$^{\mathbf{H}}$na^{L}bdi^{L}lle^{L}**shka**$^{\mathbf{H}}$ Xwanh^{MH}a'^{L} Be^{H}dw'nh^{L}
FUT.greet.much Juana Pedro
'Juana will greet Pedro energetically'

b. Pitch track for (8a)



We now turn to the question of word order and clause structure within the language. SLZ has been most recently argued to be a predicate remnant raising language by Adler et al. (2018), consistent with Lee's (2006) analysis of San Lucas Quiaviní Zapotec. Evidence comes from several sources, namely by means of analyzing copular clauses, the position of adjectives, and light verbs. Mikel Brinkerhoff (p.c.), the principal author of the SLZ prosody study cited above, notes that there are several potential issues with the Adler et al. study. For example, Adler et al. (2018) note in several places throughout their analyses of particular constructions that a verb-raising account is possible, however would require at least one more stipulation, or cut against certain typological trends. To provide just one concrete example of this, we may take the case of adverb ordering in the language.

Adler et al. (2018) show that there are three distinct classes of adverb which are differentiable by their distributional properties. Focusing on aspectual adverbs such as *chintje'* 'just (now),' *ba* 'already' and *ne'e* 'still,' we find that they must always occur in immediately pre-verbal position. Other adverbs (temporal and aspectual) do not share this distribution, and can occur in a variety of linear positions.

(14) SLZ manner adverb *chintje'* must occur preverbally (Adler et al. 2018, p. 39)

a.

Chintje'	bta	Sonia='n	zah
just	stir.COMP	Sonia=DEF	bean

'Sonia just stirred the beans'

b.

*Bta	**chintje'**	Sonia='n	zah
stir.COMP	just	Sonia=DEF	bean

c.

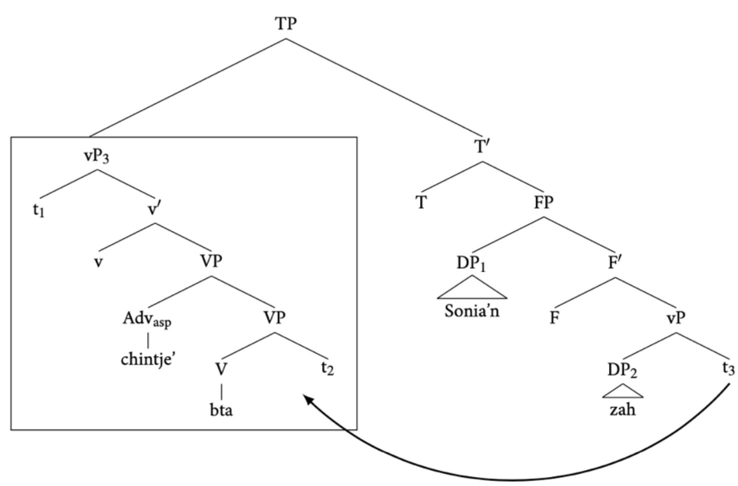
*Bta	Sonia='n	**chintje'**	zah
stir.COMP	Sonia=DEF	just	bean

d.

*Bta	Sonia='n	zah	**chinje'**
stir.COMP	Sonia=DEF	bean	just

Following Tenny (2000), Adler et al. posit that because aspectual adverbs are sensitive to the internal structure of the verbal event, they must occur closer to the verb than other adverbs. Assuming these aspectual adverbs adjoin within the VP, their linear order is explained if they, along with the verb, move with the predicate remnant to pre-verbal position, as shown in (10) below.

(15) Order of aspectual adverbs under a predicate raising account (Adler et al. 2019, p. 41)



A potential counterargument for this analysis would be that aspectual adverbs simply adjoin higher than temporal or manner adverbs (Adler et al. give Spec,TP as just such an option), but this would go against the typological trend for adverb hierarchies (Cinque 1999, among others).

The high position of aspectual adverbs is not unheard of, however. We saw in the discussion of Mam that many of its aspectual adverbs such as *xina* 'almost' and *naa=x* 'not yet' aren't formally adverbs in the strictest sense, but instead behave like predicates which embed the verbal event (refer to Chapter 3, §2.4). There is secondary evidence from Mam that there is also a high aspectual position directly below TP, which hosts the perfective suffix *=V't* and others, which cliticize onto and modify the (main) aspect marker (refer to Chapter 2, §3.2.6).

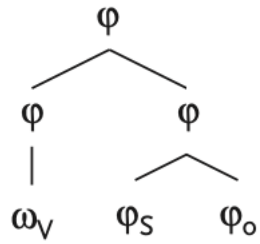
In sum, there are possible answers within a head-movement analysis of SLZ that can account for why we might see a Class I prosodic profile, per Brinkerhoff et al. (2021). Then again, we must allow for the possibility that, if the Adler et al. (2018) analysis is correct, the prosody can mediate between a predicate remnant raising syntax and a Class I prosody. In §3 of this chapter to follow, I show that the mapping from predicate remnant movement to a Class I syntax is actually ruled out by Match Theory *and* Align/Wrap Theory, with the only possible (and attested) mapping from predicate remnant raising being Class II prosody. This lends more credence to the idea that an alternative proposal to the Adler et al. (2018) analysis is likely.

2.3 Class II languages

The second class of VSO languages found in the typological search are those in which the verb, subject XP, and object XP, are all mapped onto their own phonological phrases φ. If syntax-prosody isomorphism is to be maintained, this prosodic profile can only be mapped from a VP remnant raising syntax (although we will see that in at least one Class II language, Ch'ol, mismatch is observed).

Regardless of how a given language arrives at a Class II structure, we may schematize it as below, following the discussion in Section 1.

(16) Prosodic structure of a Class II VSO language (Clemens 2021)



This structure is minimally different from Class I prosody: to restate, the only difference we expect to observe is that instead of phrasing apart from the subject XP and object XP as its own *ω*, the verb phrases as its own separate *φ*. This phrasing of the verb word as a *φ* falls out from the fact that, at least in the expected case, the verb is really a remnant VP.

Three Class II languages were found in the typological search. In the first two (Niuean and Ch'ol), word order regularly alternates between VOS and VSO depending on features of the object. In the third (Mandar), VSO word order is default. Interestingly, all three languages are argued to be head-movement languages. Therefore, as we will see, some mechanism must be involved to "promote" verbs onto *φ* in the phonological component, as they must be mismatched from their underlying syntactic referents.

2.3.1 Niuean

Niuean is a VOS/VSO-alternating word order language most recently argued to achieve its verb-initiality via head-movement of the verb by Clemens (2014a, 2014b) (contra previous approaches that posit movement of the VP or VP remnant: Massam 2000a, 2001a; Otsuka 2005).

Word order in this language alternates based on the definiteness of the object: in VSO clauses, the object is a full, definite DP; in VOS clauses, the object is a bare NP which is argued to be pseudo-incorporated into the verb (Clemens 2014a). In (17) below, we see a minimally different pair of sentences with roughly the same meaning. In the first, the clause is VSO with a definite object. In the second, the clause is VOS with an indefinite, incorporated object. This latter structure is evidenced by the object not being case-marked (and additionally not being able to be modified by other DP-level material such as plurality) and appearing immediately rightward of the verb.

(17) Niuean VOS/VSO alternation (Clemens 2014a)

a. ne fanogonogo e fwata he tau lologo he letiō
PST listen ABS youth OBL PL song OBL radio
'The youth listened to the songs on the radio' *VSO*

b. ne fanogonogo lologo e fwata he letiō
PST listen song ABS youth OBL radio
'The youth listened to the songs on the radio' (lit. 'song-listened') *VOS*

Although a VP remnant raising analysis of Niuean seems straightforward in light of this alternation, Clemens (2014a, 2014b) convincingly argues that much convergent evidence (e.g. the location of TAM and post-verbal particles, along with negation) speaks in favor of a verb-raising account of verb-initiality in the language. She argues that instead of the VP moving to clause-initial position in the syntax, the VOS option in the language is achieved by the movement of the incorporated object in PF to be pronounced in a single φ with the verb (per Selkirk's 1984 *Sense Unit Condition*). As such, the same syntactic structure can be mapped onto two different prosodic structures, assuming the object is sometimes a bare NP; this contrast is shown in (18).

(18) Niuean VOS and VSO syntactic structures (adapted from Clemens 2014b

a. VSO

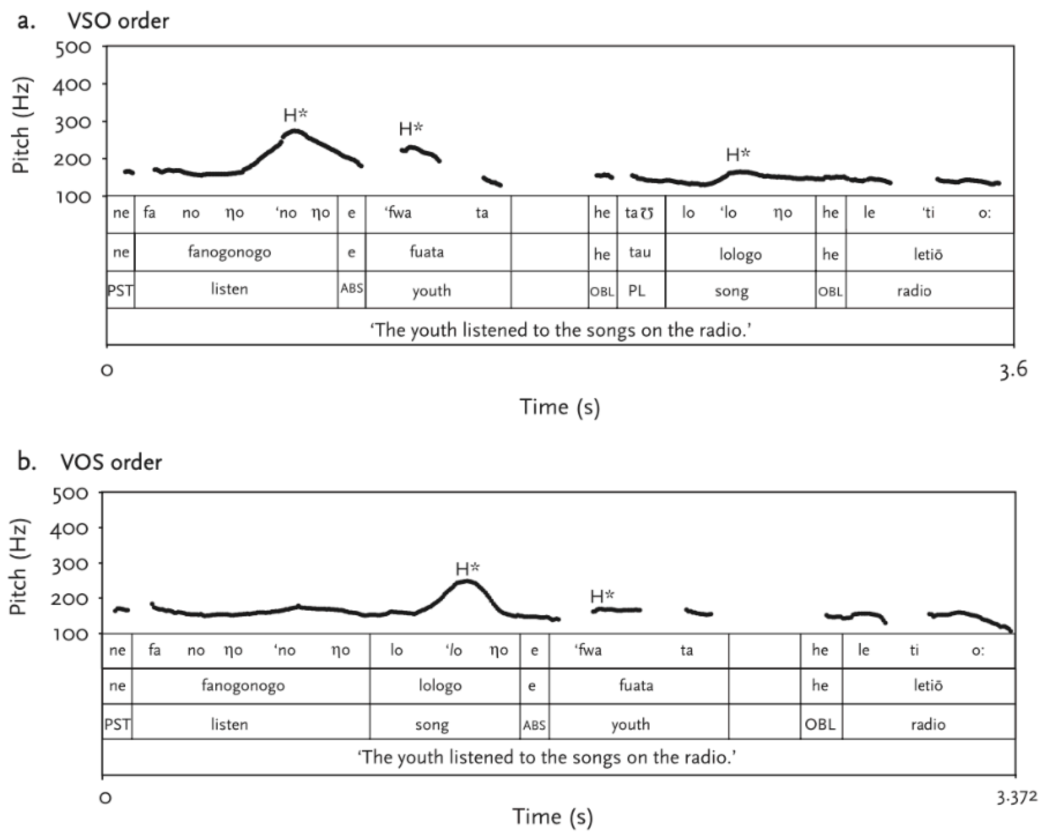
[$_{CP}$ TAM+verb [TP... [$_{vP}$ Subject [$_{VP}$ DP.Object]]]] $\rightsquigarrow$ (V ((S) (O)))

b. VOS

[$_{CP}$ TAM+verb [TP... [$_{vP}$ Subject [$_{VP}$ NP.Object]]]] $\rightsquigarrow$ ((V O) (S))

Looking specifically at the prosodic phrasing of Niuean, Clemens (2014a, 2014b) finds that there are right-aligned pitch accents (labelled H*) which occur in consistent loci: in VSO clauses, H* is found at the right edge of V, S, and O, whereas in VOS clauses, it is found only at the right edge of O and S. Clemens takes this as indicating that H* demarcates the edges of φ.

(19) Prosodic phrasing of VSO and VOS clauses in Niuean (Clemens 2021, citing Clemens) 2014a, 2014b)



It seems, therefore, that the verb in VSO clauses constitutes its own φ. Additional evidence that the verb constitutes its own φ in VSO, but not VOS clauses comes from duration: the verb is significantly longer in duration in VSO, but not VOS, for a variety of verb types (absolutives, middles, instrumentals). Although a Paired T-Test reaches significance for all verb types, the size of the effect is below the perceptibility threshold (Stevens 2000). As such, Clemens concludes that speakers are not using lengthening to cue prosodic phrasing *per se*, but the lengthening may be an artifact of speech planning.

2.3.2 Ch’ol

The facts from Ch’ol, a Mayan language of Mexico, largely mirror those found in Niuean, although in an entirely unrelated language family. Ch’ol is, like Niuean, a VOS/VSO-alternating language where word order is tied to the definiteness of the object.

(20) Ch’ol VOS/VSO alternation (Clemens 2021)

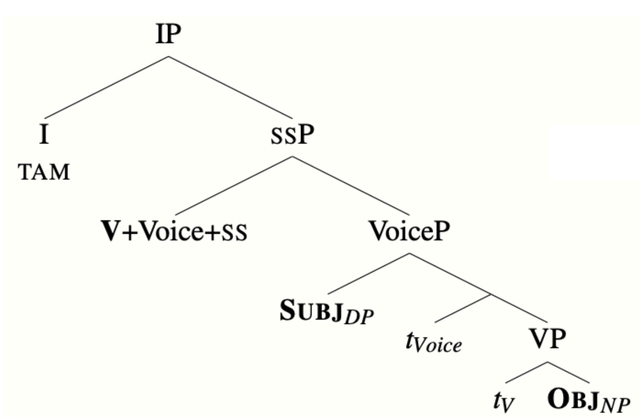
a. Tyi i-mäñ-ä [O lima] [S jiñi alob] tyi Salto
PFV A3S-buy-TV lima DET boy PREP Salto
‘The boy bought limas in Salto’ *VOS*

b. Tyi i-mäñ-ä [S jiñi alob] [O ili lima] tyi Salto
PFV A3S-buy-TV DET boy DEM lima PREP Salto
‘The boy bought these limas in Salto’ *VSO*

Although Coon (2010) proposed that Ch’ol achieves verb-initiality via movement of the VP or the VP remnant, much recent work on Ch’ol (e.g. Clemens & Coon 2018, Little 2020) has proved that this account cannot be maintained. Evidence converges from a number of language-internal factors, including the order of morphemes and certain extraction restrictions, that verb-raising is a much more appropriate analysis for verb-initiality in Ch’ol.

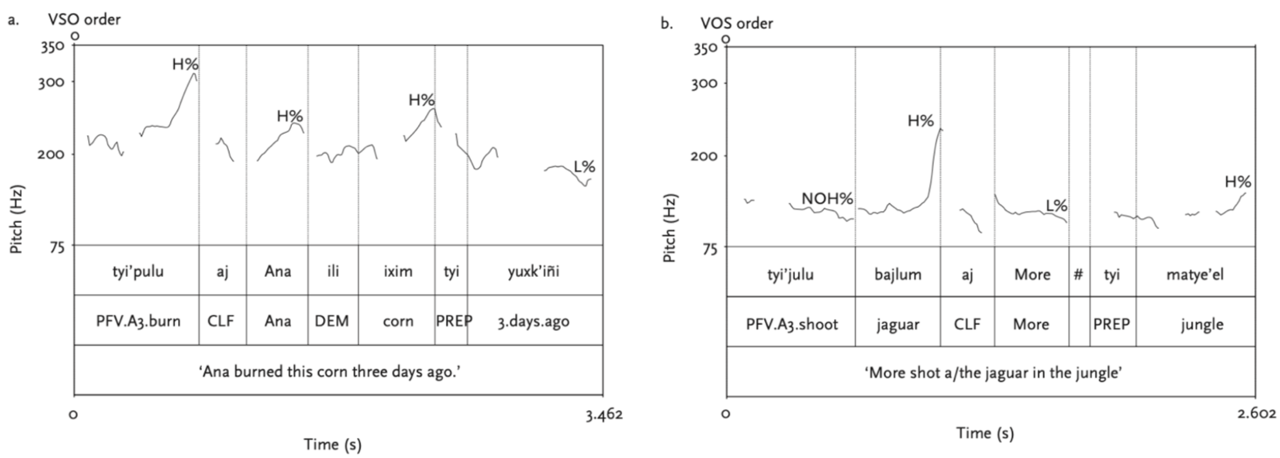
The syntactic derivation of a VSO clause in Ch’ol is given in (21) below. We see that the verb head-moves to a landing site at the edge of the maximal verbal projection (SSP), whereas the subject and object DPs remain low in the structure.

(21) Verb-raising syntax for Ch’ol VSO (Clemens & Coon 2018)



As far as prosodic phrasing is concerned, a great deal of evidence from intonational phonology that shows conclusively that Ch’ol is a Class II language, not the – perhaps expected – Class I language, given its syntactic derivation. To state the descriptive facts, in VOS clauses, the predicate (VO) and the subject (S) are each assigned a single right-aligned high boundary tone (labelled H%). In VSO clauses, H% marks the right edge of V, S, and O. Taking H% to be an indication of the right edge of *φ*, this alternation indicates that while the predicate in VOS clauses comprises a single prosodic constituent, the verb forms a prosodic constituent by itself in VSO clauses.

(22) Prosodic phrasing of VSO and VOS clauses in Ch’ol (Clemens 2021, citing Clemens & Coon 2016, 2018)



To account for the fact that the verb in VSO clauses in Ch’ol appear to be parsed as its own *φ*, Clemens & Coon (2018) invoke *prosodic wellformedness*, the idea that certain constraints on the phonological form proper can intervene to derive a prosodic shape that diverges in particular ways from the source syntactic structure. Prosodic wellformedness countermanding the need for strict syntax-prosody isomorphism is a key ingredient in Match Theory. The authors invoke the prosodic wellformedness constraint STRONGSTART (Selkirk 2011), restated as follows.

(23) STRONGSTART (Selkirk 2011)
A prosodic constituent optimally begins with a leftmost daughter constituent that is not lower in the prosodic hierarchy than the constituent that immediately follows.

In the following tableau, we can see how STRONGSTART derives the correct scenario in which the verb phrases as its own φ. The authors do not discuss explicit evidence to group the subject XP and the object XP into their own non-minimal φ constituent (such as we can determine for Irish), but we may posit that this is the case if all other syntax-prosody isomorphism holds, for which we have no evidence to the contrary.

(24) STRONGSTART derives Class II structure from verb-raising syntax (adapted from Clemens & Coon 2018, p. 262)

[$_{vP}$ verb [$_{VoiceP}$ [$_{DP}$ Subj] [$_{VP}$ [$_{DP}$ Obj]]]]	STRONGSTART	MATCH(φ, XP)	MATCH(XP, φ)
e. (verb ((Subject)$_\varphi$ (Object)$_\varphi$)$_\varphi$)$_\varphi$	*!		
f. ☞ ((verb)$_\varphi$ ((Subject)$_\varphi$ (Object)$_\varphi$)$_\varphi$)$_\varphi$		*	

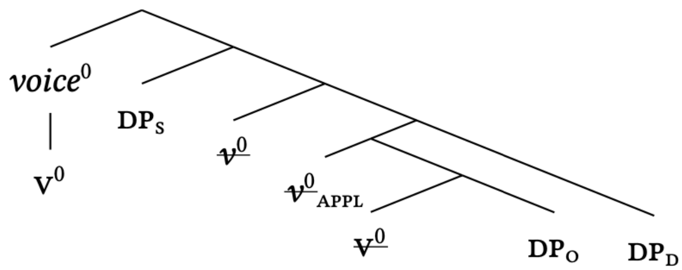
In this way, we see explicit intonational evidence coupled with a straightforward analysis in terms of Match Theory that a verb-raising language can achieve Class II prosody if a particular mismatch is obtained in the phonological component. This makes a critical prediction for our typology moving forward, in that certain types of syntax-prosody mappings are attested and accountable for under Match Theory, while conceivable mappings may be possible or impossible under Match Theory or other related theories, as I discuss in much more depth in §3 to follow.

2.3.3 Mandar

The third language which I label as a Class II is Mandar (Austronesian; Brodkin 2023). Mandar also alternates between VSO and VOS word order (although VSO is less marked). Unlike in Ch'ol or Niuean, the order of postverbal arguments is not triggered by definiteness of the object or some feature of the absolutive argument: VSO and VOS word orders are licit across clauses/voices, including transitive and antipassive (agent voice). Relatedly, the order of indirect object (labelled "D") is also free with respect to the direct object (labelled "O").

Brodkin (2023) argues that regardless of the order of elements in the post-verbal field, verb-initiality is consistent, and is most straightforwardly derived via serial head movement of the verb to a position above the subject (labelled Voice^0).

(25) VSO word order in Mandar (Brodkin 2023, p. 8)



Above, we see that the verb has rolled up to clause-initial position, and the subject and object canonically remain in their base-generated positions. The only other constituent that needs mentioning is the indirect object (DP_D), which is formally an applied object (complement of $Appl^0$) and therefore c-commands the object (as a result, Brodkin notes that DP_O cannot bind into DP_D).

Turning to prosodic phrasing, Brodkin (2023) argues that the verb, the subject XP and object XP, each form their own *φ*, which is reminiscent of both the Ch'ol and Niuean cases. Different, however, are the diagnostics of phrasing employed, which come predominantly from segmental phonology and not intonation. First, Brodkin establishes the phonological process which evidence *ι*, which is total assimilation of final /ŋ/ to match an initial voiceless stop in the succeeding word. In (26a), the bolded instances of final /ŋ/ assimilate rightward, however in (26b), this process is blocked at the right edge of a parenthetical (which constitutes its own *ι*).

(26) Total nasal assimilation demarcates right edge of *ι* (Brodkin 2023, pp. 13-14)

a.

Nawéẽt	tónaːŋ^{H}	i	tallípo**k**$^{\mathbf{H}}$	kandíʔnaː^{H}
na-eŋa**ŋ**	toŋaŋ	i	tallipo**ŋ**	kandiʔ-na
3ERG-give	truly	3ABS	telephone	little.sibling-3GEN

'He really gave his little sibling a phone'

b.

Nawéẽ**t**	tónaːŋ^{H}	i,	itim	búla**ŋ**^{H},	tallípo**k**^{H}	kandíʔnaː^{H}
na-eŋa**ŋ**	toŋaŋ	i	itiŋ	bula**ŋ**	tallipo**ŋ**	kandiʔ-na
3ERG-give	truly	3ABS	that	month	telephone	little.sibling-3GEN

'He really gave, that month, his little sibling a phone'

Next, Brodkin distinguishes two phrasal domains in Mandar: a minimal *φ* and a maximal *φ*. The minimal *φ*, Brodkin argues, is demarcated at its right edge by a high tone (^{H}).

(27) Minimal phrases in Mandar (Brodkin 2013, p. 15)

(nallíẽ$^{\mathbf{H}}$)$_{\varphi}$	(i	iáliː$^{\mathbf{H}}$)$_{\varphi}$	(itik	káɹo$^{\mathbf{H}}$)$_{\varphi}$	(kottáʔnaː$^{\mathbf{H}}$)$_{\varphi}$
na-alli-aŋ	i	iali	itiŋ	kado	kottaʔ-na
3ERG-buy-APPL	3ABS	NAME	that	present	girlfriend-3GEN

‘Ali bought his girlfriend that present’

Maximal *φ*’s can be diagnosed by a process of phrase-final lengthening, which does not necessarily occur *ι*-finally. We see that in the presence of a final adjunct, *teʔe* ‘now’, which constitutes its own maximal *φ*, lengthening occurs on it as well as the subject XP in a VSX sentence below in (28). Brodkin also notes that several other segmental process – coalescence of diphthongs, glottal deletion, and voiced obstruent lenition – also have precisely the same distribution.

(28) Final lengthening at the right edges of maximal phrases (Brodkin 2023, p. 15)

((póle$^{\mathrm{H}}$)$_{\varphi}$	(i	irám**a**ːt$^{\mathrm{H}}$)$_{\varphi}$)$_{\varphi}$	((téʔ**e**ː$^{\mathrm{H}}$)$_{\varphi}$)$_{\varphi}$
pole	i	iramaŋ	teʔe
come	3ABS	NAME	now

‘Rahman is coming now’

We see several of these diagnostics coming together to evidence a Class II structure in VSO(X) sentences. In the illustrative example below, the verb is parsed into a maximal *φ* as diagnosed by lengthening. Additionally, the subject, and object, are all parsed into a *φ*, and the S and O (plus any additional material) are matched by their own maximal *φ*, sister to that of the verb.

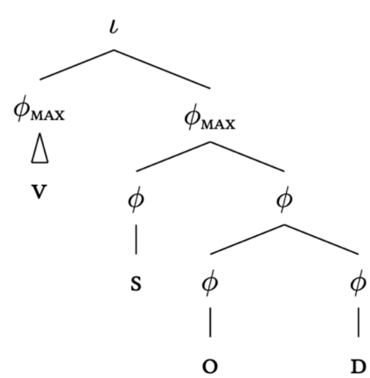
(29) Class II structure for Mandar VSO (Brodkin 2023, p. 25)

a.

((sáŋgaʔ	mámbéŋaːŋ$^{\mathrm{H}}$)$_{\varphi}$)$_{\varphi}$	((i	derrípe$^{\mathrm{H}}$)$_{\varphi}$	((wálo$^{\mathrm{H}}$)$_{\varphi}$	(pósaː$^{\mathrm{H}}$)$_{\varphi}$)$_{\varphi}$)$_{\varphi}$
saŋgaʔ	maŋ-be-ŋaŋ	i	daeŋ-ripaʔi	balao	posa
only	AV-give-APPL	AGR	lord-NAME	rat	cat

‘Lord Rifa’i only gives cats rats’

b. Structure for (24a):

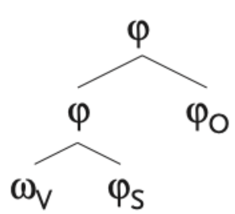


In sum, the example of Mandar gives us our third language argued to generate VSO via head-movement, but which is nonetheless consistently shown to have a Class II syntax. The only way to generate this is by some mechanism which "promotes" the verb to its own φ (Clemens & Coon 2018; Clemens 2019, 2021), instead of the "expected" ω. Brodkin (2023) notes this as a logical plausibility.

2.4 Class III languages

Last in the typology we turn to the third prosodic profile hypothesized to exist by Clemens (2021), which I have termed Class III. In this structure, the verb and subject phrase together in a non-minimal φ, and the object phrases separately, into its own φ. This is schematized in (30).

(30) Prosodic profile for Class III languages



Class III structure constitutes the third and final logical possibility for VSO prosody, if we keep the assumption that prosodic structure is preferably recursive to match recursion in the syntax. Class III structure is the prosodic profile assumed for languages directly mapping from a right-spec syntax. Continuing to put aside for the time being the plausibility of a right-spec system, which is inherently non-antisymmetric, we can try to see if there are any attested languages which have a Class III prosodic structure. Another avenue of investigation we can explore here is the possibility that Class III prosodic structure can be mapped onto from other kinds of syntactic referents besides right-spec.

2.4.1 Modern Standard Arabic

The first language which has been posited to have Class III prosody is Modern Standard Arabic (MSA; Alsafi 2017). The syntax of clause structure in MSA is fairly well studied (Oualla 1994, Mohammad 2000, Soltan 2007, among others), and the conclusions of this work is summarized here. MSA has two default word orders, SVO and VSO. There are particular sociolinguistic and variables that condition the use of one or the other order. Parkins (1981) investigates this variation across types of media; he finds in his corpus that, for example, while news *headlines* use SVO 92% of the time, the content of the news *articles* show SVO only 8% of the time. Sentences in short stories and magazines (as well as linguistics dissertations, among other media) all have a greater than 50% chance of being VSO. Parkins (1981, p. 28) notes that there are certain circumstances where VSO is patently impossible, however, such as in sentences with CP subjects.

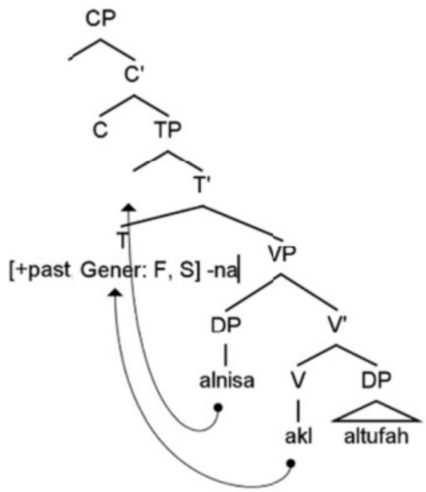
Soltan (2007) provides a recent analysis of the derivation of both SVO and VSO word orders in MSA. He argues that the difference in word order falls out from different syntactic structures with their own feature-checking systems. In SVO, the VP-internal subject raises to Spec,TP due to an [EPP] feature, with the verb additionally raising to T^0 to check a tense feature [iT] and to receive agreement from the raised subject. In VSO, on the other hand, the EPP is inactive, and the verb raises alone for the same reasons it would in SVO word order. Indeed, work since at least McCloskey's (1996) work on Irish, verb-initial languages have been argued to either lack the EPP or to satisfy it in alternative ways (Doner 2017). (See Clemens & Polinsky 2017 for discussion of how the EPP interacts with verb-initial word order, as well as Doner 2019 for an overview of EPP variation across languages.)

(31) SVO/VSO word order alternation in MSA (Soltan 2007, cited by Alsager 2020)

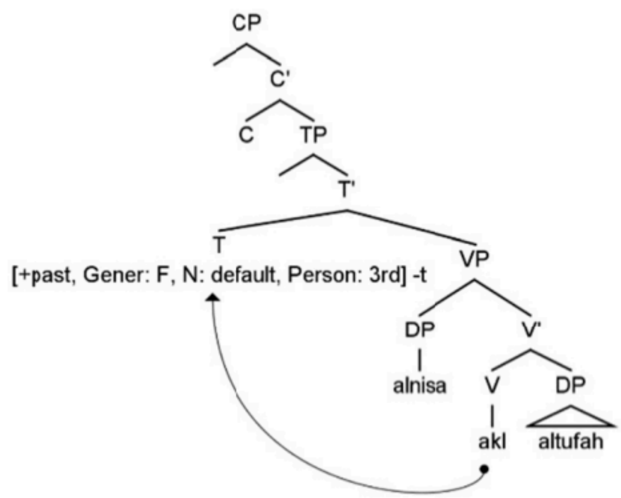
a. alnisa akl-n altufah
the-women ate-3PL.F the-apples
'The women ate the apples'

b. akl-t alnisa altufah
te-3.DEFAULT.F the-women the-apples
'The women ate the apples'

c. Tree for (29a)



d. Tree for (29b)



The prosody of MSA was recently analyzed by Alsafi (2017), who compares the prosodic profiles of both SVO and VSO word order in the language. First, he shows that for SVO sentences, the prosodic phrasing is (S) (V O) since subjects are consistently demarcated with their own φ-final boundary tones (either a pitch rise or pitch fall). Subjects additionally phrase alone depending on their length (lone, modified by adjective, and modified by RC), indicating that the language does not adjust *φ* boundaries due to size conditions. This gives us the tools to understand the distinct groupings of prosodic constituents in VSO clauses.

He shows that MSA has Class III prosodic structure in VSO clauses. Specifically, he finds that the right edge of *φ* bears a number of features: the phrasal boundary tone, as well as final lengthening and pitch reset.

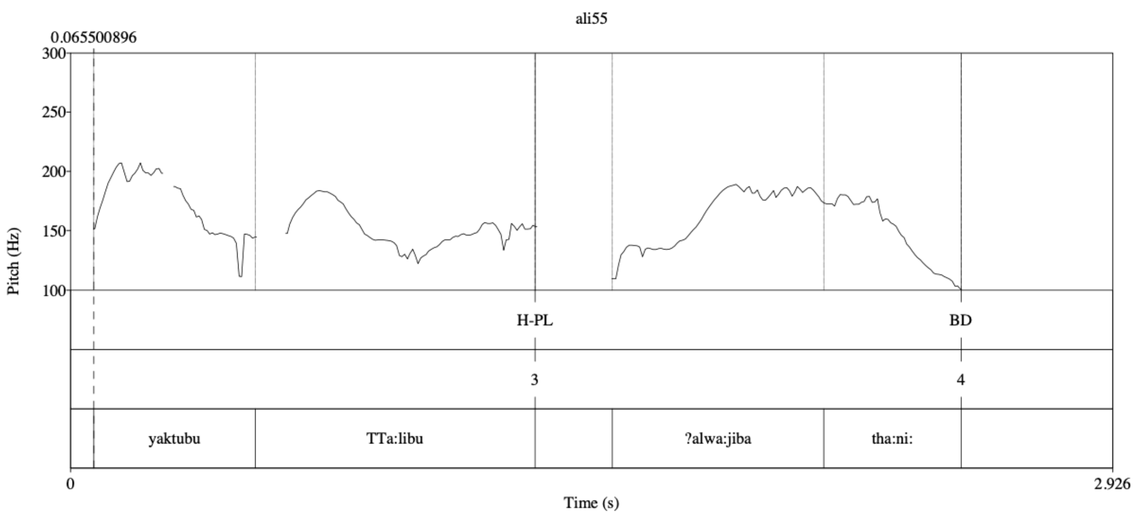
(32) Class III prosody in a VSO sentence in MSA (Alsafi 2017, p. 32)

a.

Yaktubu	tˤtˤa:lubu	ʔalwa:jba	tha:ni:
writes.SG.M	the-student.SG.M	homework.SG.M	second.SG.M

‘The student writes the second homework’

b. Pitch track for (30a)



The appearance of the consistent pause between the subject and object is the main determining factor that advances the argumentation that MSA is Class III and not Class I. Note that the distribution of phrasal tones in particular can be attributed to either structure, as shown below. However, we should not expect to see pause between S and O in a Class I structure, since they are contained within the same non-minimal *Φ* (Clemens 2021).

(33) Comparison between Class I and Class III structure (“#” = prosodic pause; Clemens 2021)

a. Class I (V ((S) *# (O)))
b. Class III ((V (S)) # (O))

Alsafi (2017) considers why we should see the verb and the subject forming a single prosodic constituent. He cites Watson & Gibson (2004), noting that the lack of prosodic boundary between the verb and the subject is attributable to the fact that the subject is a “dependent argument” for the verb, and that they should group together for the sake of what they call “recovery” for the listener. Watson & Gibson develop a theory (the Recovery and Planning model) whereby syntactic elements that rely on each other for meaning are ideally phrased together in the intonational component of externalization. This is compatible with Selkirk’s “Sense Unit Condition” (Selkirk 1984), whereby the groupings that rely on each other for meaning are referred to as a “sense unit.”

(34) The Sense Unit Condition of intonation (Selkirk 1984)
The immediate constituents of an intonational phrase must together form a sense unit.

We will see in §4 that the basic mapping and eurhythmic constraints of Match Theory cannot derive Class III prosody from a verb-raising VSO language. However, once the Sense Unit Condition is incorporated into the constraint set, this mapping becomes possible.

2.4.2 San Ildefonso Tultepec Otomi

The second language which earns Class III designation is San Ildefonso Tultepec Otomi (SI Otomi; Otomian). Somewhat similar to the Arabic case, where VSO was not the default or fixed word order, SI Otomi only shows VSO word order in particular contexts. Palancar (2004) writes of SI Otomi that it “has SVO as the pragmatically neutral order when a transitive clause has two overt NPs. Nonetheless, responding to pragmatic requirements, orders like OVS and VSO are also possible” (Palancar 2004, p. 253). As such, this case provides interesting insights into the prosodic structure of languages that only show VSO in certain, restricted, contexts. How similar is Otomi to the Arabic case discussed above?

The prosodic structure of this language is a principal focus of Palancar (2004). What sets the argumentation for prosodic structure in this language apart from the rest of the cases we’ve examined so far is that the diagnostic is almost entirely morphological, not intonational. In SI Otomi, verbs take one of two forms that are relevant here: the so-called “free form” (glossed ‘F’) and the so-called "bound form" (glossed 'B'). According to Palancar, the F-form of a verb appears at a right phrasal boundary or any clausal boundary; the B-form occurs elsewhere. The precise realization of the F-form is a verb stem ending in *-i*, and the precise realization of the B-form is a verb stem ending in *-a* ~ *-e* (some verb stems also exhibit segmental/featural change). In the following example, pay particular attention to the form of the verb *thɨn(g)-* 'to ferment, boil,' which appears in F-form in (35a) but B-form in (35b). For clarity, I have notated where the free forms or the end of an utterance evidence a prosodic boundary.

(35) Free and bound forms in SI Otomi (Palancar 2004, pp. 254-255)

a.

ʔin-dà	tz'ɔn-**i**)$_{\varphi}$	porke	ja	bì	<g>wad-**i**)$_{\varphi}$	bì	n-thɨn-**i**)$_{\varphi}$
NEG-3.FUT	go.off-**F**	because	CP	3.PST	NPS-finish-**F**	3.FUT	DTR-ferment-**F**

'It won't go off because it fermented' (lit. 'finished fermenting')

b.

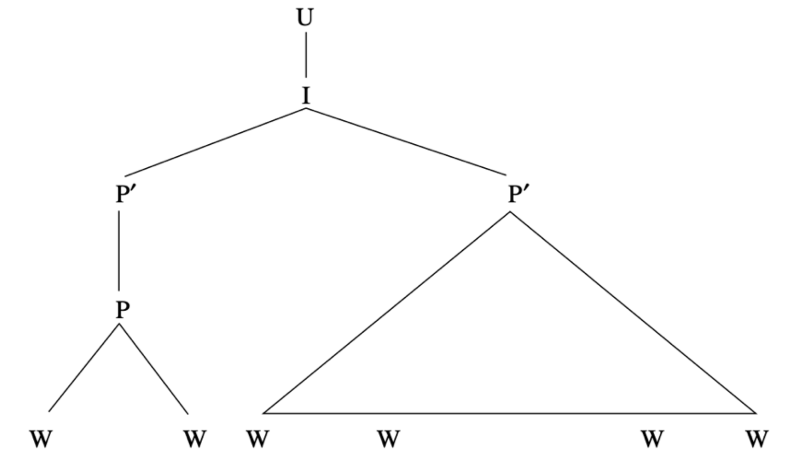
ntonse nuʔja	(š)ta	<g>wad-**i**)$_{\varphi}$	dà	n-thɨng-**a**=no=r	sẹi)$_{\varphi}$
then	now	3.P.PERF NPS.finish-**F**	3.FUT	DTR-ferment-**B**=DEF.SG=DEF	pulque

'Then, when the *pulque* is fermented...' (lit. 'finishes fermenting')

According to Palancar (2004), the alternation between F- and B- forms in SI Otomi can be used to diagnose whether or not the verb phrases prosodically with a following DP. Specifically, Palancar argues that B-forms are used when the verb and the following DP form a phonological phrase φ; F-forms are used elsewhere. Additional evidence that a verb and a following DP phrase together prosodically into a single φ unit comes from the fact that DP-initial material that is phonologically a clitic are able to affix to the end of the verb following the B-form suffix. Palancar also notes that the verb and the DP it phrases with form a single unit for the determination of phrasal stress, and that a prosodic pause between V and DP is impossible.

Looking into the phrasing of SVO in the language, we see that the subject phrases separately from the constituent containing the verb and the object, as evidenced by the diagnostics above. (Note that in Palancar's notation, "P" = phonological phrase; "I" = intonational phrase; "U" = utterance.)

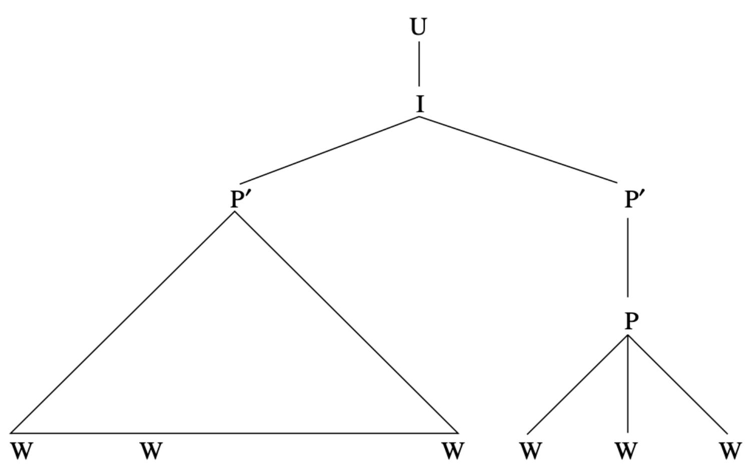
(36) An SI Otomi SVO clause with verb phrasing with object (Palancar 2004, p. 263);



(*no=r* *ndə*) (*bì* ***ʔɛʔm-a***=[*no* *ma* *mɛhti*])
DEF.SG=SG man 3.PST drive.down.cattle-B=DEF.SG 1POSS cattle
'The man drove my cattle down (the plain)'.

In a minimally different sentence which is VSO, the same verb phrases together with the *subject*, as evidenced by also being inflected in its B-form. Palancar notes that inserting a pause between the verb+clitic complex *ʔɛʔm-a=no=r* and the subject, which would also require the F-form of the verb to be used, is ungrammatical in this context.

(37) An SI Otomi VSO clause with verb phrasing with subject (Palancar 2004, p. 264)



(*bì* ***ʔɛʔm-a***=*no=r* *ndə*) (*no* *ma* *mɛhti*])
3.PST drive.down.cattle-B=DEF.SG=SG man DEF.SG 1POSS cattle
'The man drove my cattle down (the plain)'.

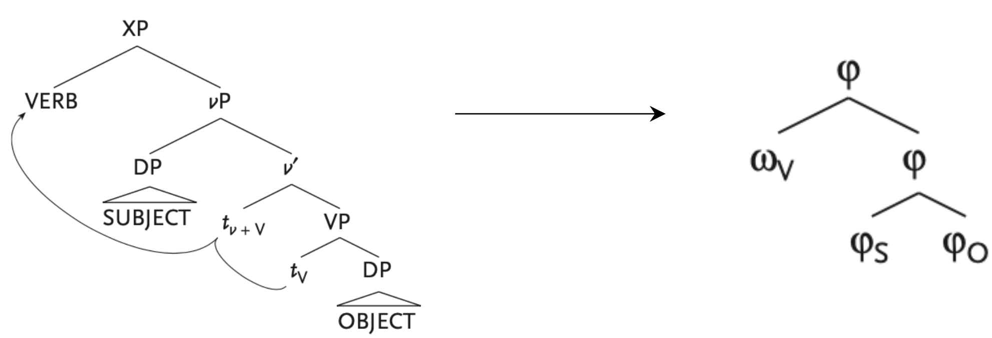
While Palancar does not develop a syntactic account of SVO *vs.* VSO word order, it is not outside the realm of possibility to attribute this alternation to the same circumstances that drive it in Modern Standard Arabic as we saw above. Essentially, there is no direct evidence that SI Otomi should be a right-spec language for VSO. If we therefore understand SI Otomi VSO as being an instance of (non-default) verb-raising, then its phrasing together of the verb and the subject is likely explainable under the same mechanisms as that of MSA. Specifically, we can invoke the Sense Unit Condition (Selkirk 1984) to enforce a verb-subject prosodic constituent, despite lacking a right-spec syntax which is assumed to be mapped onto the same type of prosodic structure in a case of isomorphism. We will return to the case of whether or not "expected"/isomorphic prosodic profiles can be countermanded in the case of a language's adherence to the Sense Unit Condition in the following section.

3 Theoretical account: generating the observed typology

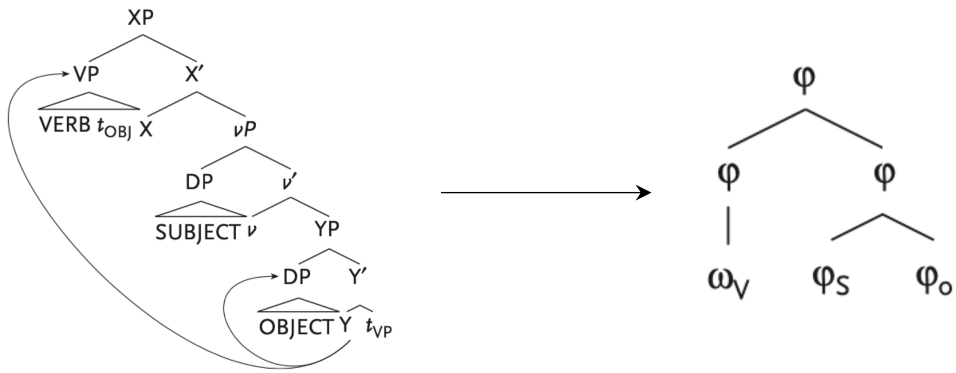
In §2, we took as a jumping-off point Clemens' (2021) proposal for what any given VSO language should look like in terms of its prosodic phrasing. Recall that there are three types of VSO word order derivations Clemens assumes are plausible: head movement languages, predicate remnant raising languages, and "right-spec" languages, each of which corresponds to a particular prosodic realization, all else being equal. I pressent these again in (38).

(38) Three paths to VSO syntax (Clemens 2021)

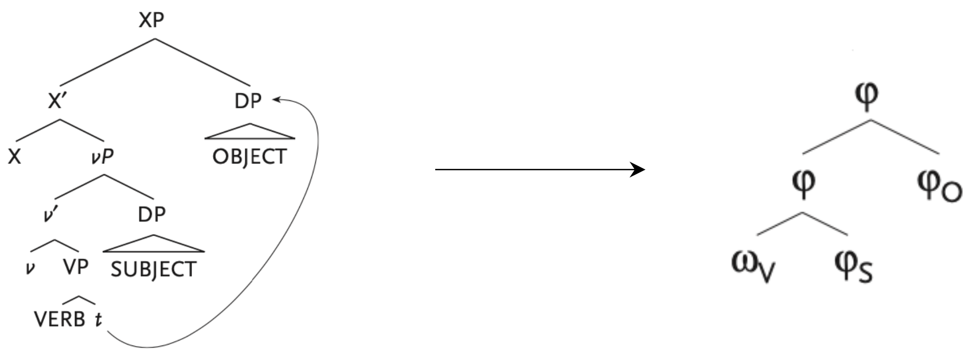
a. verb-raising



b. predicate remnant raising



c. rightward specifiers



We saw in §2 that the "isomorphic case" does not hold for all languages. For instance, we see mismatch from syntax onto prosody in languages like Ch'ol, Niuean, and Mandar: each is proposed to be a head-movement language, however it has "Class II" prosody, where the verb is phrased as its own φ, which would be unexpected if isomorphy were to obtain. We saw in other languages, such as Irish, that while it adheres to a particular Class in the general case (i.e. with branching subjects and objects), certain syntactic structures can force a change in the mapping algorithm. This mismatch, though perhaps initially unexpected, is in fact predicted by the tenets of Match Theory. Match Theory comprises a system in which two types of constraints are in competition: mapping constraints (adjudicating between the syntactic and prosodic structures to derive isomorphy) and prosodic wellformedness constrains (evaluating just the prosodic structures for markedness which may derive mismatch). As such, it is not entirely surprising to see so many languages which are mismatched to their proposed syntactic references. Certain wellformedness constraints are evidenced through this observed mismatch, such as STRONGSTART, which are well documented in the literature on the syntax-prosody interface.

In this section, I aim to generate an Optimality-theoretic system that can generate the observed mappings from syntax onto prosody. The result of this system will be to show that Match-theoretic constraints (mapping and wellformedness) are capable of generating all of the observed Classes of prosodic structure, while limiting the availability of non-existent structures. I compare the Match system with an analogous OT system using asymmetric ALIGN constraints (under Align/Wrap theory;), and conclude that although both are able to account for the observed typology, the ALIGN constraint-driven typology is less restricted and generates more languages.

3.1 Methodology

In order to construct and analyze the prosodic typology as discussed above, I implemented the SPOT tool ("Syntax-Prosody in Optimality Theory"; Bellik & Kalivoda 2019). SPOT is a JavaScript application that allows the user to create a syntax-prosody analysis within Optimality Theory. The user inputs a given syntactic structure or set of structures, and calibrates the constraint set to contain only the relevant mapping and prosodic wellformedness constraints. The SPOT app then generates an exhaustive list of languages which can be generated given that input and constraint set (CON).

SPOT generates every possible prosodic tree (the entire candidate set) given a pre-selected UR and CON (essentially the app works as an automatic GEN). Per Kalivoda (2018), this set of prosodic trees defines an *OT system* S_X = (GEN_X, CON_X). SPOT performs the calculations automatically, vastly increasing the user's empirical coverage and analytical rigor. The output of SPOT is a set of all candidates and their respective violation profiles for the given constraint set, which can be fed into a separate evaluation tool for analysis. The evaluation tool I used to analyze this OT system was the OT-Help program (Baker et al. 2007). OT-Help is a user-hosted JavaScript application that reads in an OT tableau and generates the candidate rankings for each input in GEN. Together, these two programs allow the user to create a typology of languages/prosodic profiles which are generable given a particular syntactic input and constraint set.

The first point of order is to generate a set of universal constraints which constitutes the CON for the OT system. These constraints fall into two types (mapping and prosodic wellformedness). The wellformedness constraints may be additionally subdivided into sets of constraints evaluation the particular type of wellformedness they evaluate: prosodic sisterhood and prosodic branching. The set of constraints and their definitions are listed below. All constraints are well accepted in the literature on the syntax-prosody interface; I have not added any of my own constraints.

(39) Constraints invoked in the prosodic typology

<u>*Mapping*</u>

a. MATCH(XP, *φ*)
AOV for each syntactic phrase XP whose left and right edges are not coterminous with those of a phonological phrase *φ* (Selkirk 2011).

b. MATCH(*φ*, XP)
AOV for each phonological phrase *φ* whose left and right edges are not coterminous with those of a syntactic phrase XP (Selkirk 2011).

<u>*Prosodic sisterhood*</u>

c. EQUALSISTERS (EQSIS)
AOV for each phonological phrase *φ* which has two or more daughters which are not members of the same rank in the Prosodic Hierarchy (Myrberg 2013).

d. STRONGSTART (SS)
AOV for each *φ* in the prosodic tree whose leftmost daughter is *ω*, such that it is lower on the Prosodic Hierarchy than its sister constituent immediately to its right (Elfner 2012).

<u>*Prosodic branching*</u>

e. MAXIMUM BINARITY-*φ* (BINMAX)
AOV for each phonological phrases *φ* which has more than two daughter nodes (Itô & Mester 1992).

f. MINIMUM BINARITY-*φ* (BINMIN)
AOV for each phonological phrases *φ* which has fewer than two daughter nodes (Itô & Mester 1992).

3.2 The prosodic typology

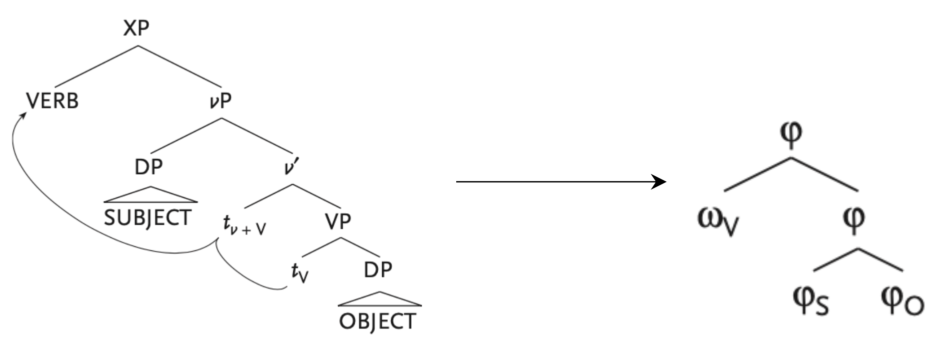
The second point of order, once our constraint set has been selected, is to see whether the above set of constraints can generate the languages represented in the typology. This discussion will come in two parts. First, we will see if, for each syntactic path to VSO, its isomorphic prosodic tree can be generated, per Clemens (2021): e.g. can Class I prosody be mapped from a verb-raising syntactic input? Second, we will see if it is possible, for any given syntactic input structure, to generate observed cases of syntax-prosody mismatch, as observed in §2: e.g. can Class II prosody be mapped from a verb-raising syntactic input, as has been proposed for a great many VSO languages? This discussion constitutes the rest of Section 3.

An additional goal off this chapter is to see if this "prosodic typology" is also generable in Align/Wrap Theory: do the two theories of the syntax-prosody interface (Align/Wrap and Match) make differing predictions, and if so, why? Which is more restrictive, i.e. overgenerates less? This discussion is left until §4.

3.2.1 Verb-raising syntax

To look individually at the three possible paths to VSO, we begin with verb-raising syntax. If isomorphy were to hold between syntax and prosody, we should expect a mapping such as in (40).

(40) Isomorphic mapping from syntax onto prosody (verb-raising)



We can consider the OT system successful in this case if it generates the prosodic tree as in (40); that is, it does not undergenerate. First, SPOT proposed 24 possible prosodic trees for a structure with an X^0 verb, and a subject and object XP. Only a small sub-set of these are mechanically derivable given the constraint set defined above. Using OT-Help to produce generable prosodic trees, we find that the OT system generates 6 languages (i.e. six prosodic trees mappable from verb-raising syntax). These are given in Table 27 below.[21]

Table 27: Prosodic trees generable from verb-raising syntax (Match Theory)

	[V [S.xp O.xp]]
1.	(V S O)
2.	((V S) O)
3.	(V S (O))
4.	((V) ((S) (O)))
5.	(V (S O))
6.	(V ((S) (O)))

The "expected" language is generated as Language 6. We also see that other mappings are possible given a re-ranking of constraints. The entirely isomorphic language's constraint ranking is given in (41).

(41) Language 6's constraint ranking (Class I prosody)
Match(XP,φ), Match(φ,XP), BinMax >> BinMin, EqSis, SS
(V ((S) (O)))

Do any of the generable languages fit into a different Class? That is, can we derive a prosodic structure that is not Class I from a verb-raising syntactic input? Yes: we find that Language 4 in the typology constitutes a Class II prosodic structure in which the verb has been "promoted" to its own φ. This is exactly what we should hope to see, given the number of languages proposed to have this "promoting" property: Ch'ol, Niuean, and Mandar.

[21] All the prosodic typologies will also have some degree of overgeneration. The extra languages are not, in and of themselves, problematic for the OT System, as the relatively small sample size of the typological survey does not preclude the possibility of finding more attested phrasings. However, less overgeneration is generally preferable, as it minimizes the number of potential optima which are not attested, and is additionally more restrictive.

(42) Language 4's constraint ranking (Class II prosody)

Match(XP,φ), BinMax, EqSis, SS >> Match(φ, XP), BinMin
((V) ((S) (O))

In order to generate the promotion, Match(φ, XP) is ranked below constraints such as BinMax and EqSis, which enforce binary-branchingness and equal sisterhood of prosodic nodes, respectively (these constraints are violated in Language 6). Note that Match(XP,φ) is still undominated, since it is not violated by the verb being parsed into its own φ: the verb is not an XP, so it satisfies this constraint.

Can a verb-raising syntax map onto Class III prosody? The picture is a bit murkier but nonetheless informative. We see in Table 2 above that there is one instance in which the verb and the subject phrase together, as would be expected of Class III: Language 2. This language looks as if it has Class III prosody; however, on further inspection in order to have the verb and subject phrase together, the subject may not be parsed into its own φ, and neither may the object.

(43) Language 2's constraint ranking (pseudo-Class III)

BinMin, BinMax, SS >> Match(XP, φ), Match(φ, XP), EqSis
((V S) O)

This prosodic tree generated by this ranking is not Class III in its truest sense. Consider a language in which the left edge of every XP is demarcated by some prosodic or phonological phenomenon. We would not expect this to be seen on either the subject or the object in Language 4. In a "true" Class III language, we should expect to see exactly this. This feature is unfortunately confounded by the fact that in many languages, it is difficult to find a "left-edge diagnostic" which can mark an XP out as being mapped to φ by means of some activity on its left edge. Irish's left-edge diagnostic was that the left edge of every (non-minimal) φ had a rising HL accent. But note that Irish also had a case of non-isomorphism: when the subject was light (i.e. non-branching), it phrased as simply a ω, and phrased together in an initial φ with the verb. Can this Match System generate such a case?

Yes, as long as we properly define what is a "light subject" in the Irish case. Per Elfner (2012), light subjects are those which are not modified by an adjective and are therefore non-branching. Elfner finds that these light, non-branching subjects phrase together with the verb in a single φ, and any branching object phrases as its own φ. If we are explicit about the syntactic input, where we replace the label "O" with a structure [N A], for a two-word phrase consisting of a noun modified by an adjective, and replace the label "S" with just [N], we see that the Irish mismatch is attainable.

Given a syntactic structure of [V $_{VP}$[N [$_{DP}$ N A]], which creates a light subject for Irish, we can see what possible languages are generated by SPOT. Then, we can compare it to a syntactic structure with a binary-branching subject [V $_{VP}$[[$_{DP}$ N A] [$_{DP}$ N A]]] and see if the same ranking will hold. Again, I have not adjusted the mapping constraints used above.[22] The number of generable languages given by OTHelp was 10 (an additional 5 are only generable in HG and are ignored here). The Irish case – where only when the subject is non-branching does it phrase in a φ with the verb, and when the subject is binary the structure remains isomorphic – is Language 8. A final ranking of Irish, then, can be given as in (44).

Table 28: Prosodic typology of possible Irishes with light subjects (left column) *vs.* heavy subjects (right column)

	[V [N [N A]]]	[V [[N A] [N A]]]
1.	(V N N A)	(V N A N A)
2.	((V N) (N A))	(V N A N A)
3.	((V N) (N A))	(((V N) (A N)) A)
4.	((V N) (N A))	((V N A) (N A))
5.	((V N) (N A))	((V) ((N A) (N A)))
6.	((V) ((N N) A))	((V) ((N A) (N A)))
7.	((V) ((N) (N A)))	((V) ((N A) (N A)))
8.	((V N) (N A))	(V ((N A) (N A)))
9.	(V ((N N) A))	(V ((N A) (N A)))
10.	(V (N (N A)))	(V ((N A) (N A)))

(44) Final ranking for Irish: Class I prosody *and* light subject behavior accounted for (Lg. 8)

BinMin, BinMax >> EqSis >> Match(XP,φ), Match(φ,XP) >> SS

[22] This is where the functionality of SPOT really came in handy. The SPOT-generated list of light subject trees alone included 176 languages; the list of binary subject trees alone include 1440 trees.

We can also investigate whether a possible ranking of MATCH constraints can generate the SLZ case, in which light subjects (clitics) are *not* phrased with the verb; this is in essence the reverse of the Irish case. Because this phrasing in SLZ only occurs if the subject is a "light" clitic, the inputs used above, where a "light" subject for Irish is simply a non-branching N, we must designate the light subject as a clitic for this task. Helpfully, SPOT allows the user to choose whether any constituent in the syntactic tree is a clitic or non-clitic element. Therefore, we can look at a system in which the attested prosody holds in the "general case" – a syntactic structure [V [$_{VP}$ [$_{DP}$ N] [$_{DP}$ N]]] – as well as in the case where the subject is a clitic: [V [$_{VP}$ =cl [$_{DP}$ N]]. We must also choose a version of STRONGSTART to use that specifically penalizes clitics at the left edges of φ: this is because without this parameter, there is no differentiating the promotion of the V to φ between the grouping of V and the clitic in order to satisfy the constraint. A more restrictive definition of STRONGSTART (Hsu 2016) that allows for this is possible in SPOT, and defined below.

(45) STRONGSTART_HSU(φ) (Hsu 2016, p. 195)

a. Assign one violation for every prosodic constituent whose leftmost daughter constituent is of type κ and is lower in the Prosodic Hierarchy than its sister constituent immediately to the right, where κ is at the left edge of a phonological phrase. A prosodic constituent κ is at the left edge of prosodic constituent π iff: a. π dominates κ, and b. no prosodic constituent that both dominates κ and is dominated by π has a leftmost daughter constituent that does not contain κ.

b. i.e. $*(\sigma \ldots)_{\varphi}$

In Table 29 below, we see that, once the appropriate STRONGSTART constraint is invoked, the following languages are generated (the label "N.syll" in OTHelp indicates that the N in subject position is a clitic, constituting just one syllable). The language reflecting the SLZ case is Language 7, with its constraint ranking given as (37).

Table 29: Prosodic typology of possible SLZ's with clitic subjects (left column) *vs.* XP subjects (right column)

	[TP V [N.clitic N.xp]]	[TP V [N.xp N.xp]]
1.	(V N.syll N)	(V N N)
2.	(V (N.syll N))	(V N N)
3.	((V N.syll) (N))	((V N) (N))
4.	(V (N.syll (N)))	((V N) (N))
5.	((V N.syll) N)	((V N) N)
6.	(V (N.syll N))	((V N) N)
7.	((V N.syll) (N))	((V) ((N) (N)))
8.	((V) (N.syll (N)))	((V) ((N) (N)))
9.	(V (N.syll (N)))	((V) ((N) (N)))

(46) Final ranking for SLZ: Class I prosody *and* clitic subject behavior accounted for (lg. 7)

BinMax, EqSis, SS_Hsu(φ) >> Match(XP,φ) >> Match(φ,XP), BinMin

In sum, I have shown here that verb-raising syntax can generate Class I and Class II prosodic profiles only; Class III is not quite generated, although we can group the verb and the subject together *as in* Class III under particular circumstances, as the Irish case showed us. Match Theory, therefore, accounts for the languages which we see in the typology. Table 30 below shows the possible mappings, then, from verb-raising languages.

Table 30: Possible mappings from verb-raising syntax

[V [[S] [O]]]	→	Class I	YES
	→	Class II	YES
	→	~~Class III~~	NO

Why is Class III not derivable under the present system? We find that that profile, if considered as a candidate in an OT tableau, is harmonically bounded by candidates representing Class I. Candidate (c) below, corresponding to Class III, receives excessive violations of MATCH constraints while faring no better on eurhythmic constraints.

(47) Class III output harmonically bounded by Class I (Match Theory)

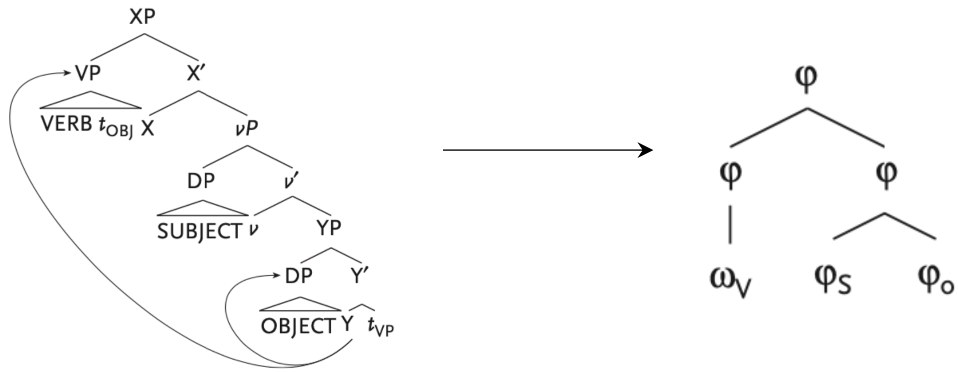
[$_{TP}$ V^0 [$_{XP}$ S [$_{YP}$ O]]]	Match(XP,φ)	Match(φ,XP)	BinMin	BinMax	SS	EqSis
a. (V ((S) (O)))			**		*	*
b. ((V) ((S) (O)))		*	***			
c. ((V (S)) (O))	*	*	**		*	*

This raises an important issue: we saw in §2 that some languages like Modern Standard Arabic and SI Otomi have been argued to derive VSO through verb-raising syntax, but nonetheless have been shown to have Class III prosody. Currently, our Match System *does not predict* that this should be possible. We willl see in §4, however, that Align/Wrap Theory also makes the same prediction, in that it is also unable generate the mapping of verb-raising→Class III. In §5, I outline a potential addition to the mapping algorithm (theoretically applicable to either interface approach) which treats the verb+subject constituent as a *sense unit* (following Selkirk 1984). Once an Optimality-theoretic constraint, enforcing these types of senses units to phrase together in the phonological component, is introduced into the system, we are able to generate the mapping of verb-raising→Class III. For now, we continue here by considering how Match Theory alone approaches other types of underlying syntactic structures.

3.2.2 Predicate raising syntax

We turn next to predicate remnant raising languages. Given this syntactic structure for VSO, which prosodic profiles are predicted to occur, if we continue couching our analysis within Match theory? Recall that if a language achieves VSO through predicate remnant raising, we should expect the following isomorphic prosodic structure, all else being equal.

(48) Isomorphic mapping from syntax onto prosody (predicate remnant raising)



Let us first see if the OT system used above for verb-raising syntax can be carried over onto this mapping. Specifically, we should hope to see predicate remnant raising syntax being able to map onto Class II prosodic structure. Given the appropriate syntactic input, and the same set of constraints used above, we see that SPOT generates 24 trees, of which OTHelp confirms there are just five are generable languages under our OT system. These languages are given in Table 31; the isomorphic mapping we expected to find is Language 4 below.

Table 31: Prosodic trees generable from predicate remnant raising syntax (Match Theory)

	[TP V.xp [S.xp O.xp]]
1.	(V S O)
2.	((V S) O)
3.	((V) (S O))
4.	((V) ((S) (O)))
5.	(V (S O))

While the "expected" language is Language 4, we also see that other mappings are possible given a re-ranking of constraints. The entirely isomorphic language's constraint ranking is given in (49).

(49) Language 4's constraint ranking (Class II prosody)

Match(XP,φ), Match(φ,XP), BinMax, EqSis, SS >> BinMin
((V) ((S) (O)))

The ranking is minimally different from that which gets us the isomorphic mapping in the case of verb-raising→Class I. We see that in this language, EqSis and SS are undominated, whereas they were previously lower-ranked. The logic for ranking these constraints high in Class II is that the initial verb, though just a word, must phrase as its own φ by virtue of its being within an entire VP (remnant). EqSis ensures that the prosodic constituent containing both the subject's and object's φ's is a sister of equal prosodic category to the φ that matches the verb. SS also ensures this, though not by enforcing equal sisterhood *per se*, but instead by making sure the clause's initial φ begins with a prosodic constituent not lower than the one to its right in the Prosodic Hierarchy. SS is necessarily violated in Class I prosody.

Do any of the generable languages fit into a different Class? That is, can we derive a prosodic structure that is not Class II from a predicate remnant raising syntax? No: although a total of 5 languages are generable in the above OT system, no other language corresponds precisely to Class I or Class III. That said, the correct constituent *groupings* can be seen: Language 5 does resemble Class I in that the verb phrases separately from the subject and object, and Language 2 does resemble Class III in that the verb and subject phrase as a separate constituent from the object. Let us look closely at these two *pseudo*-Classes.

First, Language 5, although it resembles Class I in that the verb phrases separately from the subject and object, is not Class I in its truest sense, as predicted by Clemens (2021).

(50) Language 5's constraint ranking (pseudo-Class I)

Match(φ,XP), BinMin, BinMax >> Match(XP,φ), EqSis, SS
(V (S O))

This prosodic tree generated by this ranking is not Class I in its truest sense. Consider the possibility that a language has a "left-edge diagnostic" at the left edge of every XP. While we should expect to see evidence of such a left-edge diagnostic on the object XP in Class I, in this pseudo-Class I, we should expect *not* to see it. This discussion is somewhat confounded by the fact that very few languages have been shown to have prosodic structure indicators at both right *and* left edges, and for many analyses, this structure is often analytically equivalent to Class I structure in its truest sense.

Next, we see a very similar story for Language 2 above. This language resembles Class III in that the verb and subject phrase separately from the object. Again, though, this language is not Class III in its truest sense, as predicted by Clemens (2021).

(51) Language 2's constraint ranking (pseudo-Class III)
BinMin, BinMax, SS >> Match(XP,φ), Match(φ,XP), EqSis
((V S) O)

We can once again invoke the problem of the left-edge diagnostic. Although in a "true" Class III language, we would expect prosodic indicators at the left edges of both S and O, in the above language we predict to see neither. The right-edge diagnostics would additionally be similar, although the strength of the boundary separating the initial φ from the object's φ is not expected to be as strong as it would be in a Class III language, where S and O are separated by a larger prosodic boundary.

In sum, we see here that predicate remnant raising syntax can generate the prosodic profile for Class II only; Classes I and III are not quite generated, although we can group constituents together *as in* Classes I and III given the proper reranking of constraints. Table 32 below shows the possible mappings, then, from predicate remnant raising languages.

Table 32: Possible mappings from predicate remnant raising syntax

	→	~~Class I~~	NO
[[V] [[S] [O]]]	→	Class II	YES
	→	~~Class III~~	NO

Why are Classes I and III not derivable under our present system? We find that a candidate representing Class III (51a) is harmonically bounded by a candidate representing Class III (52b). Additionally, the Class I candidate is harmonically bounded by an unattested candidate, (53b).

(52) Class III harmonically bounded by Class I (Match Theory)

$[_{TP}\,[_{VP}\,V^0]\,[_{vP}\,[_{XP}\,S]\,[_{YP}\,O]]]$	Match(XP,φ)	Match(φ,XP)	BinMin	BinMax	SS	EqSis
a. (V ((S) (O)))	*	*	**		*	*
b. ((V (S)) (O))	**	**	**		*	*

(53) Class I harmonically bounded by unattested candidate (Match Theory)

$[_{TP}\,[_{VP}\,V^0]\,[_{vP}\,[_{XP}\,S]\,[_{YP}\,O]]]$	Match(XP,φ)	Match(φ,XP)	BinMin	BinMax	SS	EqSis
a. (V ((S) (O)))	*	*	**		*	*
b. ((V) ((S) O))	*		**			*

This result raises questions for the analyses of Santiago Laxopa Zapotec described earlier in this chapter. Recall that Adler et al. (2018) argued that SLZ is a predicate remnant movement language. However, Brinkerhoff et al. (2021) present evidence that SLZ prosody is more in keeping with a Class I profile (in my terminology). The Match-theoretic results here, if correct, show that a mapping from predicate remnant raising→Class I is *not generable*. Therefore, three plausible options are given to us: (i) either the Adler et al. (2018) syntactic analysis is flawed, and head movement is indeed the correct path to VSO for SLZ; (ii) the Brinkerhoff et al. (2021) prosodic analysis is flawed, and Class II prosody is actually attested; or (iii) predicate remnant raising→Class I is in fact generable, but not within a Match-theoretic framework. As we will see later, option (iii) here is straightforwardly falsifiable because even under an alternative account of syntax-prosody mapping (Align/Wrap Theory), the mapping needed is still not generable. As such, it seems most plausible that one of the given analyses is somehow flawed, and additional investigation into SLZ syntax-prosody is warranted.

As a final note, it seems as though Match Theory allows for the "promotion" of a verb word into its own φ (verb-raising→Class II), but does not allow for the logical invers: "demotion" of a verb's φ into just a prosodic word ω (predicate remnant movement→Class I). Why should this be, and is there a possible workaround to this issue? That is, this raises a general question for the syntax-prosody mapping algorithm: is there a possible phonological wellformedness constraint that can *demote* in this way?

We can briefly consider the constraint WEAKSTART (Sabbagh 2014), which is discussed in an overview of predicate-initial languages by Clemens & Polinsky (2021). Sabbagh proposes WEAKSTART as a "counter-constraint" to the well-supported asymmetric constraint STRONGSTART. WEAKSTART assigns a violation to any surface prosodic structure in which the left-hand daughter is at the same or higher level of the prosodic hierarchy to its sister – in essence, preferring initial "weakness."

(54) WEAKSTART (Sabbagh 2014, p. 62)

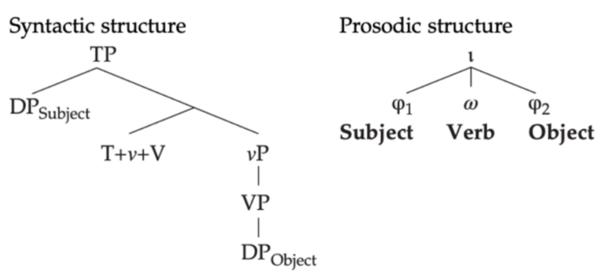
a. A prosodic constituent begins with a leftmost daughter that is no higher on the prosodic hierarchy than the constituent that immediately follows.

b. i.e. $*(\pi_1\pi_2 \ldots$, where $\pi_1 > \pi_2$

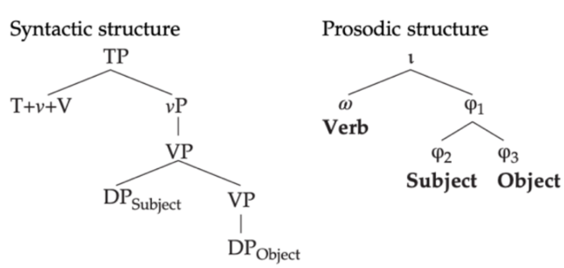
Sabbagh (2014) invokes this constraint to account for his proposal of Tagalog clause structure, although in general, WEAKSTART does not have general acceptance in the syntax-prosody literature. Sabbagh proposes that subjects in Tagalog lower to Spec,VP from their position in Spec,TP in satisfaction of this constraint, which supposedly gives rise to VSO word order with the attested prosody.

(55) Sabbagh's (2014) subject lowering account of Tagalog syntax-prosody

a. What Tagalog syntax would derive without subject lowering (unattested)



b. What Tagalog would derive with subject lowering (attested)



Sabbagh's account faces a number of theoretical issues. Clemens & Polinsky (2021), in their overview of predicate-initial word orders, discuss that subject lowering is already untenable within a wider theory of syntax which only allows for leftward, or raising, movement. Additionally, from a typological standpoint, while the theoretical underpinnings and usefulness of the constraint STRONGSTART are confirmed by many diverse case studies, the constraint WEAKSTART at the phonological phrase level, as well as other initial weakening phenomena in general, are not well attested. For the rest of Sabbagh's analysis of Tagalog syntax-prosody to go through, unary- and ternary-branchingness of φ is also required (seen above in 55a), which is also typologically unfounded.

An additional worry for WEAKSTART, which is most important for present purposes, is that it cannot fulfil the job of "demoting" an initial VP remnant's expected φ to just ω. We see that if we incorporate WEAKSTART into our OT system, the exact same set of languages is generated as would be without WEAKSTART. If we additionally dispense with STRONGSTART, a set of only four (somewhat distinct) languages is generated. In neither system do we see Class I prosody which is any different from the pseudo-Class I profiles discussed above.

Table 33: Prosodic trees generable from predicate remnant raising syntax with WEAKSTART (Match Theory)

a. with WEAKSTART

	[TP V.xp [S.xp O.xp]]
1.	(V S O)
2.	((V S) O)
3.	((V) (S O))
4.	((V) ((S) (O)))
5.	(V (S O))

b. without WEAKSTART

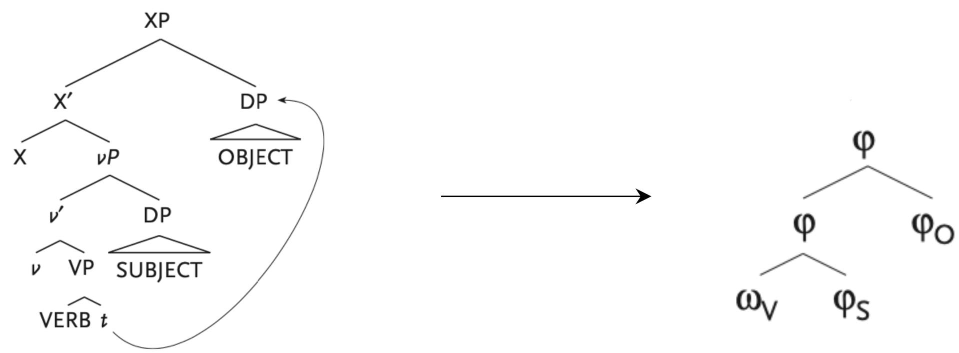
	[TP V.xp [S.xp O.xp]]
1.	(V S O)
2.	((V) (S O))
3.	((V) ((S) (O)))
4.	(V (S O))

In a development of his work on Tagalog, Sabbagh (2015) reconsiders the usefulness of the constraint, and ultimately proposes that it cannot be maintained, at least for Tagalog. It still remains as a general question whether or not such a constraint can be used to derive the mapping we lack in the prosodic typology, or if it has any benefit to our theory at all. The present investigation casts additional doubt as to the benefit of WEAKSTART, and therefore I propose that the prosodic typology shows itself as an additional reason why this constraint be dispensed with.

3.2.3 Right-spec syntax

Lastly in this subsection we turn to right-spec languages. If isomorphy were to hold between syntax and prosody, we should expect the mapping in (56).

(56) Isomorphic mapping between right-spec syntax and prosodic structure



We will consider the OT system as defined above successful if it can correctly produce a Class III prosody from a right-spec syntactic input. We find that of SPOT's 24 generated trees, OTHelp finds just five possible optima.

Table 34: Prosodic trees generable from right-spec syntax (Match Theory)

	[[V S.xp] O.xp]
1.	(V S O)
2.	((V S) (O))
3.	((V S) O)
4.	(((V) (S)) (O))
5.	((V (S)) (O))

The "expected" language is generated as Language 5. We also see that other mappings are possible given a re-ranking of constraints. The entirely isomorphic language's constraint ranking is given in (57); note that it is the exact same ranking as that which isomorphically generates Class I prosody from verb-raising syntax (compare with 41 above).

(57) Language 5's constraint ranking (Class III prosody)

Match(XP,φ), Match(φ,XP), BinMax >> BinMin, EqSis, SS
((V (S)) (O)))

Do any of the generable languages fit into a different Class? That is, can we derive a prosodic structure that is not Class III from a right-spec syntactic input? No: we find that under our OT system, a right-spec syntax only generates languages in which the verb and subject phrase together in their own prosodic constituent φ, or else generates a language in which there are no smaller groupings (Language 1 in Table 34 above).

In sum, we see here that right-spec syntax can generate the prosodic profile for Class III only; Classes I and II are not generated, and we do not even find prosodic trees resembling the groupings of those other classes. Table 35 below shows the possible mappings, then, from right-spec languages.

Table 35: Possible mappings from right-spec syntax (Match Theory)

	→	~~Class I~~	NO
[[V [S]] [O]]	→	~~Class II~~	NO
	→	Class III	YES

Why are Classes I and II not derivable under the present system? Each profile, if considered as a candidate in an OT tableau, is harmonically bounded by a candidate representing a Class III profile. Candidates (58a) and (58b) below, corresponding to Classes I and III, respectively, receive excessive violations of MATCH and/or eurhythmic constraints. To put it more simply, it is not in a candidate's favor to "re-group" the verb-subject φ into any other configuration, as this leads to fatal mapping violations.

(58) Classes I and II outputs harmonically bounded by Class III (Match Theory)

$[_{TP} [_{VP}\ V^0\ [_{DP}\ S]]\ [_{XP}\ O]]$	Match(XP,φ)	Match(φ,XP)	BinMin	BinMax	SS	EqSis
a. (V ((S) (O)))	*	*	**		*	*
b. ((V) ((S) (O)))	*	**	***			
c. ((V (S)) (O))			**		*	*

3.3 Local summary

To locally summarize so far, this simple OT system can easily derive all isomorphic syntax-prosody mappings for attested VSO languages. Given our constraint set, which includes just commonly-employed Match-theoretic constraints, the only case of non-isomorphism/mismatch we are able to derive is verb-raising syntax mapping onto Class II prosody. Table 36 below summarizes the possible and impossible mappings within our Match-theoretic system described up until now.

Table 36: (Im)possible mappingsfrom VSO syntax onto prosody (Match Theory)

Head-movement			Predicate remnant raising			Rightward specifiers		
✓	✓	×	×	✓	×	×	×	✓
CI	CII	CIII	CI	CII	CIII	CI	CII	CIII

Next, in §4 I will compare this Match-theoretic system of possible mappings, summarized above, with that generated by an analogous OT system couched within Align/Wrap Theory.

4 Comparing Match Theory with Align/Wrap Theory

Two potential avenues are opened if we take the results of Section 3 in hand without pressing further. The first, to take a hard-line Match-theoretic approach, is that the above possible and impossible mappings constitute the predicted set of languages (syntax-prosody mappings) that can exist. This approach is more restrictive, and also more easily falsifiable. We see, for example, that it is possible to derive Class II prosody from verb-raising syntax (see the case of Ch'ol, Niuean, and Mandar): this is predicted to be possible under the present account. Other kinds of mappings, e.g. from predicate remnant raising to Class III prosody, is not generable by constraint ranking – which, if this approach is to be taken seriously, means that this kind of mapping is impossible, and shoud not be attested in any language's prosodic system. The fact such languages are unattested in our typological survey is some evidence in favor of this approach.

The second approach is to try and see if any other syntax-prosody mappings are theoretically possible, just under a different theory of the interface. To do so, we can invoke Align/Wrap Theory, which employs asymmetric constraints of the ALIGN family (Selkirk 1986 1996; McCarthy & Prince 1993; Truckenbrodt 1995, 1999). This is in lieu of Match Theory's symmetrical Recent work at the interface (e.g. Kalivoda 2018, Kalivoda & Ishihara 2021) has been undertaken to understand the formal differences and typological predictions of Match Theory *vs.* Align/Wrap Theory. Align/Wrap Theory also employs one symmetrical constraint, commonly along with WRAP (Truckenbrodt 1995, 1999), which is not identical to MATCH, as will be seen below. To restate more explicitly from Chapter 1, we can see the constraint definitions under this theory in (59). All other eurhythmic constraints are identical to that under the Match-theoretic system.

(59) Definitions of Align/Wrap constraints

<u>*Syntax-prosody mapping*</u>

a. Align-L(XP, φ)
Assign one violation for each node of category XP in the syntactic tree whose **left edge** is not aligned with the **left edge** of a node of category φ in the prosodic tree.

b. Align-R(XP, φ)
Assign one violation for each node of category XP in the syntactic tree whose **right edge** is not aligned with the **right edge** of a node of category φ in the prosodic tree.

c. Wrap(XP)
Assign one violation for each node of category XP in the syntactic tree that does not have corresponding φ in the prosodic tree, where φ contains all the terminals dominated by XP.

<u>*Prosody-syntax mapping*</u>

d. Align-L(φ, XP)
Assign one violation for each node of category φ in the prosodic tree whose **left edge** is not aligned with the **left edge** of a node of category XP in the syntactic tree.

e. Align-R(φ, XP)
Assign one violation for each node of category φ in the prosodic tree whose **right edge** is not aligned with the **right edge** of a node of category XP in the syntactic tree.

f. Wrap(φ)[23]
Assign one violation for each node of category φ in the prosodic tree that does not have corresponding XP in the syntactic tree, where XP contains all the terminals dominated by φ.

We see that Align/Wrap Theory employs more mapping constraints than Match Theory (6 compared to just 2). This predicts that the number of generable languages (prosodic trees) will be larger (Kalivoda & Ishihara 2021).

4.1 The prosodic typology

Just like in the previous Section, we can construct a prosodic typology of our OT system under Align/Wrap theory. Like before, we will first see if, for each syntactic path to VSO, its isomorphic prosodic tree can be generated, per Clemens (2021): e.g. can Class I prosody be mapped from a verb-raising syntactic input? Second, we will see if it is possible, for any given syntactic input structure, to generate observed cases of syntax-prosody mismatch, as observed in the foregoing typological section: e.g. can Class II prosody be mapped from a verb-raising syntactic input?

We will see in this section that under Align/Wrap theory, no additional mappings are generable (an indeed, it overgenerates far more of unattested patterns), whereas Align/Wrap theory fails to account for certain attested patterns because it is unable to be reward recursion.

4.1.1 Verb-raising syntax

First we can examine the case verb-raising syntax under Align/Wrap theory. Our OT system causes SPOT to output 24 languages, of which only six are generable per OTHelp.[24] We see that, counterintuitively, there is no language which correctly corresponds to Class I prosody. The possible prosodic trees are given Table 37.

[23] This constraint, mapping from prosody onto syntax, is not given in the original work on Align/Wrap theory by Truckenbrodt (1995, 1999), but is a logical possibility which is implementable in SPOT. I have included it here for completeness.
[24] An additional language is generable if Harmonic Grammar is assumed instead of classical OT; I ignore it here.

Table 37: Prosodic trees generable from verb-raising syntax (Align/Wrap Theory)

	[V [S.xp O.xp]]
1.	(V S O)
2.	((V S) (O))
3.	((V S) O)
4.	((V) (S O))
5.	(V (S O))
6.	(V (S (O)))

We see that there are two languages in this list – Languages 5 and 6 – that parses the verb as a prosodic word ω to the exclusion of the subject and object, which are phrased together in a φ. However, these languages are not Class I in the truest sense, as the phrasing (V ((S) (O))) is not observed. This means that we are not predicting that prosody should be recursive in the way we see in the typology. For example, the Class I prosody in Connemara Irish requires (V ((S) (O))) specifically, or else the distribution of boundary tones is not accounted for appropriately. This result is actually briefly remarked upon by Elfner (2012, p. 22). She notes that, in an OT tableau, the candidate corresponding to a correct Class I prosodic structure – i.e. that evidenced by Irish – will always be harmonically bounded by other candidates under Align/Wrap Theory.

Elfner notes that if we allow Match to dominate some constraint NONREC(URSIVITY), discouraging recursivity of prosodic constituents, the preferred output wins.

(60) Match Theory prefers isomorphic candidate (Elfner p. 21)

[$_{\Sigma P}$ [$_{TP}$ V^0 [[DP_1] [DP_2]]]	Match(XP,φ)	NonRec
a. (V DP_1 DP_2)	*!**	
b. (V) (DP_1) (DP_2)	*!*	
c. (V (DP_1) (DP_2))	*!	**
d. ☞ (V ((DP_1) (DP_2)))		***

We see however in (61) that when the Align/Wrap mapping constraints are instead invoked, and ranked above NONREC, the preferred optimum in (51d) is harmonically bounded by (51c)

(61) Align/Wrap, prefers a non-isomorphic candidate (Elfner p. 22)

[ΣP [TP V^0 [[DP_1] [DP_2]]]	Align-R(XP,φ)	Wrap	Align-L(XP,φ)	NonRec
a. (V DP_1 DP_2)	*!		*!**	
b. (V) (DP_1) (DP_2)		*!*		
c. ☞ (V (DP_1) (DP_2))				**
d. ☹ (V ((DP_1) (DP_2)))				*!**

This comparison shows that Align/Wrap Theory discourages certain instances of recursion, whereas Match Theory encourages it, at least in cases of syntax-prosody isomorphism. Because recursion is required for the correct distribution of boundary tones in Irish, for example, Align/Wrap constraints are insufficient. It is interesting that Elfner's analysis and the current prosodic typology here both predict that candidate (61d) is harmonically bounded, although I do not invoke the constraint NONREC.

4.1.2 Predicate remnant raising syntax

Next to look at are VP remnant raising languages. SPOT generates 24 possible trees, of which just six are possible optima. The set of possible prosodic trees is given below.

Table 38: Prosodic trees generable from predicate remnant raising syntax (Align/Wrap Theory)

	[[V] [S.xp O.xp]]
1.	(V S O)
2.	((V S) O)
3.	(((V) S) O)
4.	((V) (S O))
5.	(V (S O))
6.	(V (S (O)))

Again as before, the same problem arises when we attempt to use Align/Wrap theory: the closest candidate to Class II prosody – Language 4 above – is not sufficiently recursive. Language 4 does achieve the correct grouping – V phrases as its own φ and so does the combination of S and O – but it does not qualify as an isomorphic structure if we are to take Clemens (2021) at face value as I have been doing.

4.1.3 Right-spec syntax

Lastly we can examine right-spec languages. SPOT generates 24 trees, of which only 6 are possible optima. These are presented in Table 39 below.

Table 39: Prosodic trees generable from right-spec syntax (Align/Wrap Theory)

	[[V S.xp] O]
1.	(V S O)
2.	((V S) (O))
3.	((V S) O)
4.	((V) (S O))
5.	(V (S O))
6.	(V (S) O)

Here again, we find that although there is a language generated under this system – Language 2 above – which groups the constituents in a way similar to that of Class III, there is no truly isomorphic Class III prosody. Language 2 groups the verb and the subject into a single phonological phrase φ to the exclusion of the object, but the subject is not first parsed into its own φ as would be expected: ((V (S)) (O)).

4.2 Combining Match Theory and Align/Wrap Theory

For completeness, we should see if a hybrid theory of the syntax-prosody mapping is better able to account for the prosodic typology than either Match Theory or Align/Wrap Theory alone. I define this "hybrid theory" as that which contains the set of all Match-theoretic mapping constraints in conjunction with the set of all Align/Wrap-theoretic constraints, keeping constant the eurhythmic constraints (which are shared between the two anyway).

What are the benefits of a hybrid interface theory? We find that at least in some case studies that Match Theory alone cannot account for the proper post-syntactic linearization of certain elements (e.g. Bibbs 2019a,b for light clitics in Chamorro), and that at least one asymmetric ALIGN constraint is needed. For the last few years, it has been an open research question as to just how much empirical coverage can be attained by combining Match and Align/Wrap into a single set of hybrid mapping constraints (see Bibbs 2019). We predict that, although the number of logically possible trees for a VSO syntax should be the same as before ($n = 24$), a larger number of possible optima (i.e. generable trees) should be output by OTHelp because there are more available constraints and therefore more possible constraint rankings.

4.2.1 Verb-raising syntax

We begin with verb-raising syntax. SPOT generates the same number of prosodic trees ($n = 24$), but we see more generable prosodic trees ($n = 11$). These are given in Table 40 below.

As a first pass to facilitate cross-theoretic comparison, do we at least see that the hybrid theory can generate Classes I and II prosody as just Match Theory alone can? The answer is yes: Language 8 corresponds to Class I and Language 6 corresponds to Class II. For Language 8, we see that every mapping constraint is undominated, along with BINMAX ensuring maximal binarity of prosodic branching.

(62) Language 8's constraint ranking (Class I)

Match(XP,φ), Match(φ,XP), Align-L(XP,φ), Align-R(XP,φ), Wrap(XP), Align-L(φ,XP), Align-R(φ,XP), Wrap(φ), BinMax >> BinMin, EqSis, SS
(V ((S) (O)))

For Language 6, we see that the eurhythmic constraints SS, and EQSIS are undominated compared to in Language 8, and the only Align/Wrap-theoretic constraint that become dominated from Language 8 to Language 6 is Align-R(φ,XP).

(63) Language 6's constraint ranking (Class II)

Match(φ,XP), Align-L(XP,φ), Align-R(XP,φ), Wrap(XP), Align-L(φ,XP), Wrap(φ), BinMax, EqSis, SS >> Match(φ,XP), Align-R(φ,XP), BinMin
((V) ((S) (O)))

"True" Class III prosody is not generated, though *pseudo*-Class III can be seen in Language 3 and Language 4. We see, therefore, that the hybrid theory has no greater typological coverage than Match Theory alone.

Table 40: Prosodic trees generable from verb raising (hybrid theory)

	[V [S.xp O.xp]]
1.	(V S O)
2.	((V S) (O))
3.	((V S) O)
4.	(V S (O))
5.	((V) (S O))
6.	((V) ((S) (O)))
7.	(V (S O))
8.	(V ((S) (O)))
9.	(V ((S) O))
10.	(V (S (O)))
11.	(V (S) O)

4.2.2 Predicate remnant raising syntax

Next we move to predicate remnant rising syntax. Again, SPOT generates the same number of prosodic trees (n = 24), and a larger number of generable prosodic trees (n = 8). These are given in Table 16 below.

It is at this point that the hybrid theory diverges in its predictions from just Match Theory alone. Recall that for just Match Theory, the possible mappings from predicate remnant raising syntax included *only* that for Class II. In the hybrid theory, we see that Class II *and* Class I are generable.

Table 41: Prosodic trees generable from predicate remnant raising syntax (hybrid theory)

	[[V] [S.xp O.xp]]
1.	(V S O)
2.	((V S) O)
3.	(((V) S) O)
4.	((V) (S O))
5.	((V) ((S) (O)))
6.	((V) ((S) O))
7.	(V (S O))
8.	(V (S (O)))

We see that Class II, the "expected" or entirely isomorphic prosody, is represented in Language 5 above. The constraint ranking for this language, in which all constraints but BINMIN are undominated, is given below. Neither Class I or Class III are faithfully generated. Again, we see no improvement in typological coverage compared to Match Theory alone.

(64) Language 5's constraint ranking (Class II)

Match(XP,φ), Match(φ,XP), Align-L(XP,φ), Align-R(XP,φ), Wrap(XP), Align-L(φ,XP), Align-R(φ,XP), Wrap(φ), BinMax, EqSis, SS >> BinMin
((V) ((S) (O)))

4.2.3 Right-spec syntax

Lastly, we can see what type of prosodic trees are generable from right-spec syntax under the hybrid theory. To have at least the same typological coverage, we should expect to see just Class III prosody being generable. This is indeed what we see. Of the same number of possible prosodic trees produced by SPOT (n = 24), and slightly larger number of potential optima (n = 7), we see just Class III represented – as Language 5 – and neither of Classes I or II.

Table 42: Prosodic trees generable from right-spec syntax (hybrid theory)

	[[V S.xp] O.xp]
1.	(V S O)
2.	((V S) (O))
3.	((V S) O)
4.	(((V) (S)) (O))
5.	((V (S)) (O))
6.	(V (S O))
7.	(V (S (O)))

The constraint ranking for the isomorphic Language 5 is given below. Note that it is exactly identical to the constraint ranking deriving the isomorphic prosodic profile (Class I) from verb-raising syntax.

(65) Language 5's constraint ranking (Class III).

Match(XP,φ), Match(φ,XP), Align-L(XP,φ), Align-R(XP,φ), Wrap(XP), Align-L(φ,XP), Align-R(φ,XP), Wrap(φ), BinMax >> BinMin, EqSis, SS
((V (S)) (O))

4.3 Local summary

To locally summarize, Align/Wrap Theory is descriptively inferior to Match Theory, in that the former disfavors candidates that are recursive in the way the latter allows/prefers them to be. When the two theories are combined into a "hybrid theory", in which both Align/Wrap Theory's and Match Theory's mapping constraints are joined, there is slightly more overgeneration, but no more actual languages seen in the typology are generable. As such, we can, at least in this domain, conclude that Align/Wrap-theoretic constraints are an unnecessary addition to a theory of mapping syntactic constituents onto prosodic constituents. We therefore have evidence from a new empirical domain – prosodic typology of VSO languages – that Match Theory is more appropriate to deriving the attested languages than Align/Wrap Theory or the two together as a hybrid theory.

It is not simply that Align/Wrap overgenerates due to the fact that there are more constraints in a given OT system (as noted by Kalivoda & Ishihara 2021): instead, the fundamental problem with Align/Wrap uncovered here is that it actually *undergenerates*. The fundamental problem with the hybrid theory is that it *overgenerates more*. Here, I argue that Match Theory is the superior framework because it only minimally overgenerates while at the same time keeping the maximum empirical coverage.

In §5 to follow, I take up one last open question: although Match Theory is more preferable than Align/Wrap Theory or the hybrid theory, it still fails in one respect. Specifically, we see that Match Theory is unable to generate a mapping of verb raising syntactic structure onto a Class III prosodic structure, which has been argued to hold of languages like Modern Standard Arabic and SI Otomi.

5 Selkirk (1984)'s Sense Unit Condition and its family of constraints

We saw in the case of Modern Standard Arabic and SI Otomi that Class III prosodic structure is implicated despite neither of the two languages having right-spec syntax. We saw in the §4 that, under Match Theory, Class III prosodic structure is not derivable if the language's source syntax is anything other than right-spec. The implication of this theoretical model, then, is that neither MSA or SI Otomi should be able to map to Class III.

How should we address this puzzle? As noted earlier, it is possible to appeal to an idea such as Selkirk's (1984) Sense Unit Condition (SUC), a condition on prosodic phrasing dictating that a phrase should ideally contain those syntactic constituents that rely on each other for meaning. Each unit of this type is referred to as a "sense unit." A somewhat more recent development of this concept is developed in Watson & Gibson (2004).

Originally, the idea of only certain syntactic constituents "relying" on others for meaning is pinned down formally by Selkirk in the following way. If in a given sentence, C1 and C2 are two syntactic constituents, the following two conditions in (66) must hold. The SUC itself can be defined as in (67).

(66) Conditions on forming a sense unit (Selkirk 1984, p. 291)

a. C1 modifies C2 (a head); and
b. C1 is an argument of C2 (a head)

(67) The Sense Unit Condition of intonation (Selkirk 1984, p. 286)

The immediate constituents of an intonational phrase must comprise a *Sense Unit*.

The SUC has somewhat fallen out of favor among linguists working at the syntax-prosody interface, in favor of different, Optimality-theoretic, approaches, although within the same spirit. (See Clemens 2014a for in-depth discussion and comparison). Some of these are outlined here.

5.1 Developments in the theory of the "sense unit"

The first major development in the theory of grouping constituents together in the prosody which may not form constituents in the syntax comes from Henderson's (2012) account of unexpected phrasing in the Mayan language K'iche'. In Kiche', the verb stem-final status suffix *-ik*, which tracks transitivity information, only appears at the ends of clauses/intonational phrases, as in (68) below.

(68) K'iche' *-ik* in clause-final position (Henderson 2012)

a. X-in-kos-**ik**)$_\iota$
com-b1s-tire-**ss**
'I am tired'

b. X-in-kos(***-ik)** r-umal nu-chaak)$_\iota$
com-b1s-tire-**ss** a3s-rn a1s-work
'I am tired of my work'

However, when the relational noun/preposition *umal* 'because' embeds a CP complement, *-ik* is, unexpectedly, allowed to surface. Compare (64b) with the minimally different (65) below.

(69) X-in-kos-**ik** r-umal [CP x-in-chsakun-ik]
com-a1s-tire-**ss** a3s-rn com-a1s-work-ss
'I am tired because I work' (Henderson 2012)

We expect a CP such as *x-in-chakun-ik* to map to an intonational phrase *ι*. If that is the case, however, the use of *-ik* on the matrix verb cannot be accounted for. Henderson (2012) therefore proposes a constraint COMPLEMENT-*φ*, which requires a functional head to be phrased into the same phonological phrase *φ* as its complement.[25]

(70) COMPLEMENT-*φ* (Henderson 2012, p. 68)
A functional head is parsed into the same prosodic constituent as its syntactic complement.

This constraint enforces the following prosodic structure, where the head of the relational noun phrase (PP) is incorporated into the same *ι* as its complement CP.

(71) Implementation of COMPLEMENT-*φ*
a. *(X-in-kos-**ik** [PP rumal)$_ι$ (x-in-chakun-ik])$_ι$ no COMPLEMENT-*φ*
b. (X-in-kos-**ik**) [PP (rumal x-in-chakun-ik])$_ι$ COMPLEMENT-*φ*

In sum, COMPLEMENT-*φ* mandates that any head-complement pair should be ideally parsed into its own prosodic constituent.

A similar constraint, ARGUMENT-*φ* (Clemens 2014a), has also been proposed, but leads to somewhat different behavior. ARGUMENT-*φ* is a constraint which enforces a head and its internal argument(s) to be adjacent sub-constituents of the same *φ*.

(72) ARGUMENT-*φ* (Clemens 2014a, p. 130)
A head and its internal argument(s) must be adjacent sub-constituents of a phonological phrase *φ*.

The purpose of this constraint is to allow for a syntax-prosody mapping which can linearly reorder the constituents within a structure at PF, not simply adjust prosodic boundaries. Specifically, Clemens looks at Niuean clause structure and its relationship to prosody and

[25] Royer (2022) posits a counter-proposal to Henderson (2012) that allows for there to be no mismatch.

concludes that while verb-raising syntax derives Niuean's VSO, whenever the object is indefinite, VOS word order surfaces in which V and O form a single φ. Candidates that phonologically displace the order of elements from underlyingly VSO to surface VOS satisfy ARGUMENT-φ, whereas those which do not violate it.

(73) Violation profiles of various surface prosodic constituent groupings (Clemens 2014a, p. 130)

$[_{CP}$ Verb $[_{DP}$ Subject$]$ $[_{VP}$ t_V $[_{NP}$ Object$]]]$	ARGUMENT-φ
a. (V (Subject)$_\varphi$ (Object)$_\varphi$)$_\iota$	*!
b. ☞ ((Verb Object)$_\varphi$ (Subject)$_\varphi$)$_\iota$	
c. ☞ ((Subject)$_\varphi$ (Verb Object)$_\varphi$)$_\iota$	

Note that under this approach to phrasing, the "sense unit" in the spirit of Selkirk (1984) is the verb and its internal argument: VO_{NP}.[26] There is no *a priori* reason why we cannot invoke some kind of prosodic constraint enforcing the verb and the *subject* (with which it has a selectional relationship) to ideally form a prosodic grouping.

Something in the spirit of this idea has been proposed as well, in the name of Selectional Contiguity, a part of the broader Contiguity Theory (Richards 2014). Selectional Contiguity can be written as a constraint that enforces two constituents in a selectional relationship to phrase together.[27]

(74) Selectional Contiguity (Richards 2014)

If α and β are related via Selection, create a level of prosodic phrasing on which α and β are not separated by any prosodic phrase boundaries.

Richards goes so far as to propose that satisfaction of this constraint is so paramount that languages may resort to verb-raising arise to satisfy it, since, as Clemens (2014a, p. 124) notes, the movement of X^0's follows the path of selection.

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[26] See Clemens & Coon (2018) for why definite O_{DP} behaves differently from bare O_{NP} on ARGUMENT-φ.

[27] Also in the spirit of selectional contiguity is the constraint SERIALIZE (Tyler & Kastner 2022) which holds that two verbs in a serial verb construction should be phrased into the same phonological phrase.

Based on these developments, it seems logically possible to propose a kind of "contiguity" constraint enforcing that the verb phrase with its subject. The idea behind this constraint will be to form what we might call a "sense unit" out of a grouping of V and S, to the exclusion of O. We can define the constraint as follows.

(75) SENSEUNIT

a. The verb and the subject form a "sense unit" in VSO languages.
b. AOV for any verb and subject which are not within the same (non-maximal) φ in the prosodic representation.

(76) Violation profiles for various prosodic trees on SENSEUNIT

[$_{XP}$ Verb [$_{VP}$ [$_{DP}$ Subject] [$_{V'}$ t_V [$_{NP}$ Object]]]	SENSEUNIT	BINMAX
a. ☞ ((Verb (Subject)$_\varphi$)$_\varphi$ (Object)$_\varphi$)$_\varphi$		
b. (Verb (Subject)$_\varphi$ (Object)$_\varphi$)$_\varphi$		*!
c. (Verb ((Subject)$_\varphi$ (Object)$_\varphi$)$_\varphi$)$_\varphi$	*!	
d. ((Verb)$_\varphi$ (Subject)$_\varphi$ (Object)$_\varphi$)$_\varphi$	*!	*

Do we find that, once this SENSEUNIT constraint is incorporated as a eurhythmic constraint into our OT system, we can derive Class III prosody from verb-raising syntax, as is the case for Modern Standard Arabic and SI Otomi? Recall that, without SENSEUNIT, verb-raising syntax in a Match-theoretic OT system could generate Classes I and II already, but not Class III. Do we get any more empirical coverage with SENSEUNIT?

We see that SPOT outputs 24 possible trees, of which just nine are possible optima, shown in Table 18. Of them, Class I prosody is represented as Language 9, Class II prosody is represented as Language 7, and Class III prosody is represented as Language 5. Indeed, we see that just by the inclusion of this constraint, we can map onto any kind of attested prosodic structure given a verb-raising syntax.

(77) Language 9's constraint ranking (Class I prosody)

Match(XP,φ), Match(φ,XP), BinMax >> BinMin, EqSis, SS, SenseUnit

(78) Language 7's constraint ranking (Class II prosody)

Match(XP,φ), BinMax, EqSis, SS >> Match(φ,XP), BinMin, SenseUnit

(79) Language 5's constraint ranking (Class III prosody)

BinMax, SenseUnit >> Match(XP,φ), Match(φ,XP) >> BinMin, EqSis, SS

Table 43: Prosodic trees generable from verb-raising syntax (Match Theory + SENSEUNIT)

	[V [S.xp O.xp]]
1.	(V S O)
2.	((V S) (O))
3.	((V S) O)
4.	(((V) (S)) (O))
5.	((V (S)) (O))
6.	(V S (O))
7.	((V) ((S) (O)))
8.	(V (S O))
9.	(V ((S) (O)))

In sum, we can say that the addition of SENSEUNIT gives us the ability to map from verb-raising to Class III prosody, as is argued for Modern Standard Arabic and SI Otomi. This constraint is *not in the SPOT interface*, and so I had to be implemented manually. This constraint, as well as other constraints within the "sense unit" genre should be considered in future in work at the syntax-prosody interface as a way to generate attested groupings that Match Theory alone may be unable to generate.

6 Summary

To summarize this chapter, we set out to answer three questions, which are repeated below.

1) What are the attested prosodic structures of world VSO languages?
2) Does our theory of the syntax-prosody mapping predict all and only these attested structures?
3) If not, is a more accurate approach possible?

I find that there are three prosodic profiles that are attested across world VSO languages, in keeping with the predictions of Clemens (2021), repeated again below.

(80) Three classes of VSO surface prosodic structure

a.	Class I:	$(\mathrm{V}\ ((\mathrm{S})_{\varphi}\ (\mathrm{O})_{\varphi}\ )_{\varphi}\ )_{\varphi}$	ex., Irish
b.	Class II:	$((\mathrm{V})_{\varphi}\ ((\mathrm{S})_{\varphi}\ (\mathrm{O})_{\varphi})_{\varphi}\ )_{\varphi}$	ex., Ch'ol
c.	Class III:	$((\mathrm{V}\ (\mathrm{S})_{\varphi}\ )_{\varphi}\ (\mathrm{O})_{\varphi})_{\varphi}$	ex., SI Otomi

I also find that Class I languages can be distinguished based on the behavior of light (non-branching) subjects. While in Irish, a light (non-branching) subject will form a phonological phrase with the verb, in SLZ, a light (clitic) subject will simply attach to the verb as a prosodic word.

When we compared two major theories of syntax-prosody mapping (Match Theory and Align/Wrap Theory), we found that although Match Theory can predict all cases of isomorphy and at least one case of mismatch (verb-raising→Class II prosody), Match Theory is unable to predict the attested mapping from verb-raising syntax→Class III prosody. I show that once we augment the Match-theoretic constraint family with a constraint SENSEUNIT, a eurhythmic constraint enforcing the prosodic grouping of the verb-subject "sense unit," we are able to generate all the attested mappings while avoiding the unattested ones to a greater extent than Align/Wrap Theory. Therefore, I show here, using the novel empirical domain of VSO prosodic typology, that Match Theory is a superior interface approach than Align/Wrap Theory.

CHAPTER 6

Conclusion

This dissertation set out to answer a number of questions regarding Mam syntax, prosody, and the general interface of syntax-prosody, with a particular focus on VSO languages.

In Chapter 3, I used a variety of diagnostic tests to adjudicate between a number of previously proposed possible syntactic structures for Mam's fixed VSO word order: verb-raising (Clemens & Coon 2018), predicate remnant raising (Coon 2010b), and rightward specifiers (Otaki et al. 2019, Little 2020b, Scott 2023). The results of these diagnostic tests provided the strongest evidence in favor of Mam's VSO word order being derived through *verb-raising*, as opposed to either of the other mechanisms. The adoption of verb-raising satisfactorily accounts for a number of observed syntactic phenomena in Mam, such as morpheme order, ellipsis, the order of adjectives, negation, and the variable position of directional auxiliaries.

In Chapter 4, I described the prosodic structure of Mam, with a view toward how observed prosody could have been mapped from its source syntax. I found that across a variety of sentence types, prosodic phrasing was highly isomorphic to a given syntactic referent, even to the point of mirroring the syntax's recursive structure. Results were informed by intonational cues such as pitch excursions, downstep, and pause. I used this result to argue in favor of Match Theory (Selkirk 2009, 2011; Elfner 2012) as a framework for understanding the syntax-prosody interface, as opposed to Align/Wrap theory (Chen 1987, Selkirk 1986; Truckenbrodt 1995, 1999) or some hybrid theory combining elements of both.

In Chapter 5, I expand my empirical scope to look at the typology of VSO syntax-prosody. Cross-linguistically, I find that there are only three observed prosodic profiles for VSO languages (or languages where VSO is an option), as predicted by Kalivoda (2018) and Brinkerhoff et al. (2021). While Mam fits into the first class (along with languages like Irish and Tagalog), a number of languages which have also been argued to achieve VSO through verb raising fall into other classes, indicating that syntax-prosody isomorphism is not universal. Using a factorial typology methodology, I predicted which possible syntax-prosody mappings should be attested in world languages when Match Theory, Align/Wrap Theory, and a hybrid theory, are employed. Match Theory succeeded in generating the most attested languages while undergenerating the least, although none was able to account for languages like Arabic and SIT Otomi, where the verb and subject phrase together when they are not part of the same constituent in the syntax. To account for this, I proposed a constraint SENSEUNIT (after Selkirk's 1984 *Sense Unit Condition*), which compels VSO languages to group the verb and subject together; this is highly ranked in some, but not all, VSO languages.

Other contributions of this dissertation outside of the core content chapters include a detailed grammatical sketch of Todos Santos Mam (Chapter 2) and three transcribed oral texts elicited in Todos Santos, Cuchumatán, Guatemala (Appendix A). Todos Santos Mam has historcially not been as well documented, compared with other Mam varieties, and additionaally does not enjoy a sociolinguistic status as a normative variety. Additionally, the most recent descriptive and analytical work on Todos Santos Mam (Canger 1968) is difficult to interact with due to its use of an outdated analytical framework and phonetic transcription system. I hope that by bringing modern linguistic tools for description and analysis to bear on it, that I can put focus on this fascinating and rich Mam dialect and give Todos Santos Mam speakers a voice to share their language with us.

APPENDIX A

Three Mam oral texts

1 Documenting oral texts

As appendix to this dissertation, I include, with the consent of their narrators, a handful of transcribed oral texts spoken in Mam. These texts were elicited as part of a larger project of oral text collection in Todos Santos Mam, which has vastly fewer resources – spoken or written – compared to other Mam varieties. All text were recorded during August and September, 2022.

The texts were transcribed in three steps. First, a Mam-speaking UCLA undergraduate listened to the texts with me and related the general meaning of each sentence. Following that first pass, we wrote the Mam text out word for word. Finally, we glossed the texts, throughout which process I asked the native speaker participant for input on unfamiliar words and grammar structures.

2 The texts

2.1 Text 1: *Cuento de mi padre* (narrated by speaker ZC)

In this text, speaker ZC describes a story told to her by her father. The story describes an instance of a local belief that when a person is on the brink of death, they or their spirit visits itself upon their loved ones.

(1)

Ja'la=wa,	t-i'j	q'iij	ja'la,	ma	chin-aq'	qb'aa-l=x
today=EMPH	A2/3S-RN:OBL	day	today	PROX	B1S-begin	tell-INF?=DIR

t-e	jun	qb'aa-q,	jun	*historia*,	*o*	jun	*cuento*.
A2/3S-RN:PAT	INDF	tell-NMLZ?	INDF	LSP:story	SP:or	INDF	SP:tale

'Today, I'm going to tell a tale, an *historia*, or a *cuento*.'

(2) Ti'=tza[28]=la t-e t-b'i', *pero* ch-aj ch-u'n=xa
what=well=DUB A2/3S-RN:GEN A2/3S-name SP:but A2/3P-want A2/3SP-RN:COMP=CLF

ch-b'i'n t-e=xa jun *cuento*.
A2/3P-hear A2/3S-RN:PAT=CLF INDF SP:tale
'Well, whatever it's called, but they want to hear a *cuento*.'

(3) T-e o Ø-b'aj, at=tza jun w-e='ya qa
A2/3S-RN:GEN COM B2/3S-finish EXIST=well INDF A1S-RN:GEN=LP PL

n-chman e-Ø-tzaj ch-qb'a-'n=xa w-e='ya w-e,
A1S-grandfather COM-B2/3S-DIR A2/3P-tell-DS=CLF A1S-RN:GEN=LP A1S-RN:DAT

que=xa w-e='ya n-man.
SP:that=CLF A1S-RN:GEN=LP A1S- father
'Some time ago, there's one (story) that my grandparents told me about my father.'

(4) At jun txi xuu'j n-Ø-yo'la t-u'ya=xa[29], *pero*
EXIST INDF CLF woman INC- B2/3S-talk.AP A2/3S-RN:COM=CLF SP:but

t-e T-wi' Witz=txa[30] t-e txi xuu'j.
A2/3S-RN:GEN A2/3S-head mountain=CLF A2/3S-RN:GEN CLF woman
'There was a woman talking to him, but this woman was from *Twi' Witz*.'

(5) *Entonces*, n-Ø-yo'la=xa t-u'ya=txa, *pero* o Ø-t-il=xa
SP:then INC-B2/3S-talk.DS=CLF A2/3S-RN:COM=CLF SP:but COM B2/3S-A2/3S-see=CLF

ja txa jun q'iij *antes*, t-u'n=tza=la
DEM CLF INDF day SP:before A2/3S-RN:COMP=well=DUB

t-majee=xa t-u'ya=txa.
A2/3S-get.married=CLF A2/3S-RN:COM=CLF
'So, he was talking with her, but he saw her a day before, since he was going to marry her.'

(6) *Pero* ti'=la Ø-Ø-ok iq'a=txa, n-Ø-tzaj yaab'=txa.
SP:but what=DUB COM-B2/3S-DIR happen.AP=CLF INC-B2/3S-DIR sick=CLF
'But something bad happened to her, she got sick.'

---

[28] The enclitic *=tza(n)* is glossed as 'well,' and is used to connect the present utterance to what the speaker has said before. It is equivalent to English 'well,' 'then,' or 'so.'

[29] A place above the valley in which Todos Santos is situated. *Twi' Witz* means 'above the mountain' or 'the mountain's head.'

[30] Idiom: courting.

(7)

Entonces,	n-Ø-ee=tz=tl			t-e=xa	b’eet-al	qonii’ya,
SP:then	INC-B2/3S-go.out=come=other			A2/3S-RN=CLF	walk-INF	at.night

ti’sa	ch-e=xa[31]	xinaq	ch-teen	ch-u’n,	chi	
as	A2/3P-RN=CLF	man	A2/3P-do	A2/3P-RN:AGT	B2/3P	

ee-tz=xa	b’eet-al	qonii’ya.
go.out=come=CLF	walk-INF	at.night

‘So, he was walking at night, how men do, they go walking at night.’

(8)

Dice	*que*	Ø-jaw	nii-n=xa	Ø-jaw	nii-n=xa,	q’aq
SP:say	SP:that	A2/3S-DIR	go-AP=CLF	A2/3S-DIR	go-AP=CLF	as

t-u’j	b’e’	oj	n-qo	jaawa,	n-qa	aaj
A2/3S-on	road	when.fut	INC-B1P.IN	go.up.AP	INC-B1P.IN	return.here

meltz’aj	t-u’j	*cementerio.*
return	A2/3S-RN:in	SP:cemetary

‘It’s said that he was walking up and walking up, like how we go up on the road returning from the cemetary.’

(9)

Ø-Ø-jaw	nii-n=xa	*dice*	*que*	ch’it=tza	t-jaawa=xa
COM-A2/3S-DIR	go-AP=CLF	SP:say	SP:that	almost=well	A2/3S-go.up.AP=CLF

t-e	t-ja’=xa,	qa	aaj=tza	t-u’j	tzuj
A2/3S-RN:GEN	A2/3S-house=CLF	B1P	return.here-well	A2/3S-on	DEM?

crucero	t-u’n	n-qa	aaj=k’a	Ma’xa
SP:crossroads	A2/3S-RN:COMP	INC-B1P.IN	return.here=DIR	Ma’xa

t-u’ya	*San Martín*[32],	ch’it=tza	t-jaawa=xa	jatz=tza=wa.
A2/3S-RN:COM	San Martín	almost=well	A2/3S-go.up=CLF	there=well=EMPH

‘He was going up, it’s said, until he had almost gotten up to his house, (like) how we go to the crossroads to return to Ma’xa and San Martín, well he’d almost gotten up there.’

---

[31] This is one of many examples throughout the narrative in which a relational noun occurs *inside of* a larger DP. It is either *e* ‘RN:GEN, RN:PAT’ or *i’j* ‘RN:OBL.’ England (1983, p. 340, endnote 5) notes RNs being used in unexpected environments in a narrative from Ixtahuacán Mam, although it’s not the same usage as here.

[32] Ma’xa and San Martín are towns nearby to Todos Santos.

(10)	*Dice*	*que*	kloolj,	*como*	at=pa=tza	*luz*?	Joo'=wa[33]
	SP:say	SP:that	dark	SP:as	EXIST=INT=well	SP:light	yes=EMP

n'aal=tza	*luz*.
none=well	SP:light

'It's said that when it got dark (at night), was there light? No, there was no light.'

(11)	*Entonces*,	k-jaaw-il=xa,	x-Ø-che'ya=xa	jun	t-i'j	xuu'j,
	SP:then	B2/3S-go.up-POT=CLF	DIST-B2/3S-see.AP=CLF	INDF	A2/3-RN:OBL	woman

lu	jun	t-i'j	xuu'j	t-kub'-al=tch.
DEM	INDF	A2/3S-RN:OBL	woman	A2/3S-down-NMLZ=SAY

'So he was going up, he saw this woman, there was this woman down there.'

(12)	*Pero*	Ø-Ø-eel	t-u'j	t-witz=xa[34]	ya'n	j=aj
	SP:but	COM-B2/3S-go.out	A2/3S-in	A2/3S-head=CLF	just.as	DEM=REL

txi	xuu'j	n-Ø-yo'la	t-u'ya=xa.
CLF	woman	INC-B2/3S-talk.AP	A2/3S-RN:COM=CLF

'But he noticed it was just the woman he was talking to.'

(13)	E'y,	ti'n	t-aj	txi	lu	tzalu',	ya'n=tza	lu=txa	at
	Hey	why	A2/3S-want	CLF	here	here	just.as=well	LU=CLF	EXIST

T-wi'	Witz,	tzu'n=xa	joo'=wa=tch.
A2/3S-head	mountain	truly=still?	yes=EMPH=SAY

'Hey, why's that woman here, right here? Isn't it true she's from Twi' Witz?'

(14)	*Pero*	kuma	kloolj	mii'n=xax	x-Ø-aq'	t-witz=xa
	SP:but	because.of	darkness	NEG=EMPH	DIST-B2/3S-start	A2/3S-face=CLF

t-i'j[35],	*pero*	ja	t-e	txi	x-Ø-che'ya=xa,
A2/3S-RN:OBL	SP:but	DEM	A2/3S-RN	CLF	DIST-B2/3S-see=CLF

ja	txa	x-Ø-che'ya=xa.
DEM	CLF	DIST-B2/3S-see=CLF

'But because of the darkness, nothing was visible, but it was the woman he saw, it was the woman he saw.'

---

[33] The word *joo'* or its more emphatic counterpart *joo'=wa*, meaning 'it is true/so, verily, truly, indeed, yes' is often used in fluent conversation as a means to affirm both what oneself is saying, as seen here, and what a conversational partner is saying. It is often accompanied by *tzu'na* (as seen in line 13), essentially meaning, 'what you said/is said is true.' According to England (1983, p. 305), it is formed from the enclitic demonstrative *=jo* 'this, that.' As such, it may be related to the relativizer *aj* and the demonstrative proclitic *j=* in Todos Santos Mam.

[34] Idiom: notice, lit. 'left his face.'

[35] Idiom: unable to see, invisible, lit. 'his face didn't start.'

(15) *Pero* n-Ø-ok xb'aj=txa, tjel txi xuu'j n-Ø-yo'la
SP:but INC-B2/3S-DIR hide=CLF what CLF woman INC-B2/3S-speak.AP

t-u'ya=xa, n-Ø-ok xb'aj=txa t-che jun k'ul
A2/3S-RN:COM=CLF INC-B2/3S-DIR hide=CLF A2/3-beneath INDF bush

tzu'n=tza joo'=wa
truly=well yes=EMPH
'But she hid, the woman talking to him, she hid beneath a bush, it's true.'

(16) *Pero* mii'n=xax ch'ik'aj, *entonces* *lo* *que*
SP:but NEG=EMPH visible SP:then SP:that SP:which

Ø-tzee=xa, Ø-Ø-el t-ii-'n=xa, *como* n-Ø-sh'iich'a,
B2/3S-do=CLF COM-B2/3S-DIR A2/3S-bring-DS=CLF SP:as INC-B2/3S-smoke.AP

tzu'n=xa ju'wa, n-Ø-el=tza t-ii-'n=xa t-wi' jun
truly=CLF it.is.true INC-B2/3-DIR=well A2/3S-bring-DIR=CLF A2/3S-head INDF

poosb'il t-u'n=tza t-ok t-chq'-et t-sh'iich'a=xa,
match A2/3S-RN:COMP=well A2/3S-DIR A2/3S-strike-PAS A2/3S-cigarette=CLF

t-u'n=tza ch'ik'aj alkee j=txi xuu'j
A2/3S-RN:COMP=well visible which DEM=CLF woman

o tz'-ok xb'aj t-che jun b'aqmant[36].
COM B2/3S-DIR hide A2/3S-beneath INDF elderberry.bush
'But she wasn't visible, so what he did was he took out, since he smoked, it's true, he took out a match head, so that he could light up his cigarette, in order to see which woman it was who hid beneath an elderberry bush.'

(17) *Entonces*, n-Ø-poon=tzan kaaya=xa=tch, n-Ø-che'ya
SP:then INC-B2/3S-DIR=well approach=CLF=SAY INC-B2/3S-see.AP

t-e=xa, lu t-e=txa xuu'j t-ook=x
A2/3S-RN:GEN=CLF LU A2/3S-RN:GEN=CLF woman A2/3S-go.in=go

t-che j=b'aqmant, *entonces*...
A2/3S-under DEM=elderberry.bush SP:then
'So he approached, and he saw, there was the woman who went beneath the bush, then...'

[36] The common elderberry or American black elderberry (*Sambucus canadensis*), which gives white flowers and small black fruits (Sp. *saúco*). The word *b'aqmant* in Mam is bimorphemic: the first element is *b'aq* 'soot,' likely referring to the color of its fruits; the second morpheme is from *aman* 'elderberry', the common name for the bush. Interestingly, the first morpheme of this word is almost homophonous with the word *b'aaq* meaning 'bone, skeleton.' It is possible that the choice of this particular bush figuring in the story is not coincidental, as it is the site where ZC's father encounters his fiancée as a skeleton. In that case, its use in the story could be a means to reference the bush's supernatural property as a place where such apparitions may occur.

(18) N-Ø-ok=tza t-lase-'n xin t-sh'ich'=xa=tch,
INC-B2/3S-DIR=well A2/3S-put.close-DS CLF cigarette=CLF=SAY

n-Ø-ok=tza t-che'ya=xa mera=xax t-u'j
INC-B2/3S-DIR=well A2/S-see.DS=CLF SP:very=EMPH A2/3S-RN:in

t-witz=txa=tch.
A2/3S-face=CLF=SAY
'So he put his cigarette up close, he looked closely at her face, he said.'

(19) Aj ya'n xuu'j t-e=txa, nuq jun ti'jb'aaq
when? NEG.STAT woman A2/3S-RN=CLF only INDF skeleton

t-ook=x t-che b'aqmant.
A2/3S-go.in=go A2/3S-beneath elderberry.bush
'But it wasn't a woman, only a skeleton that had gone beneath the elderberry bush.'

(20) N-Ø-jaw=tza si'ypaj=xa ja'la, n-Ø-ok=tza t-tzq'o-'n=xa
INC-B2/3S-DIR=well be.afraid=CLF now INC-B2/3S-DIR=well A2/3S-light.up-DS=CLF

t-txa'n poosb'il, yaa mii'n=tza q'aq t-e=xa
A2/3S-nose match SP:already NEG=well fire A2/3S-RN:GEN=CLF

poosb'il.
match
'He got spooked now, he lit up the end of a match, but the match wouldn't light.'

(21) N-Ø-eel=tza n-Ø-eel=tza... n-Ø-el=tza
INC-B2/3S-go.out=well INC-B2/3S-go.out=well INC-B2/3S-DIR=well

b'eet=xa=tch, *pero* oo='t=tza si'ypaj=xa.
walk=CLF=SAY SP:but COM=PFV=well be.afraid =CLF
'He went off, went off, went off, he went off walking, but he'd been spooked.'

(22) Aj yaa t-i'j sq'ix t-e klaaxh, ja txi
when? SP:already A2/3S-RN:OBL dawn A2/3S-RN:GEN morning, DEM CLF

xuu'j n-Ø-yo'la t-u'ya=xa, oo='t Ø-b'aj=txa.
woman INC-B2/3S-speak.DS A2/3S-RN:COM=CLF COM=PFV B2/3S-die=CLF
'But early in the morning, the woman who was talking with him, she had died.'

(23)

N-Ø-jaaw=tl	tumil[37]	*que*	e-Ø-tzaaj	t-e
INC-B2/3S-go.up=other	idea	SP:that	COM-B2/3S-come.here	A2/3S-RN:PAT

t-k'u'j=txa	ma	Ø-b'aj,	tchi=tza	joo'=wa
A2/3S-stomach=CLF	PROX	B2/3S-die	it.is.said=well	yes=EMPH

'It was known that she had a stomach ache, it's true.'

(24)

Ja=tza	jun	*pasado*	qb'aa-q=tza,	jun	*cuento*,	ma	jun
DEM=well	INDF	SP:past	tell=NMLZ?=well	INDF	SP:tale,	or	INDF

historia,	tchi=xa	w-e='ya	n-man.
SP:story	it.is.said=CLF	A1S-RN:GEN=LP	A1S-father

'Well that was what happened in the past, a *cuento*, or an *historia*, that my father told.'

(25)

Ja=tza	jun=ja	ch-aj=xa=la	t-u'n	ch-b'i-'n
DEM=well	INDF=DEM	A2/3P-want=CLF=DUB	A2/3S-RN:COMP	A2/3P-hear-DS

t-e=xa,	ja=tza	jun	*historia*	o	Ø-b'aj.
A2/3S-RN=CLF	DEM=well	INDF	SP:story	COM	B2/3S-finish

'It's something they wanted to hear, a story that happened.'

2.2 Text 2: *Winq'a q'iij* (narrated by speaker FPM)

In this text, speaker FPM describes some of the traditional customs undertaken when a child is born in their community. During first twenty days of a child's life (corresponding to the 20-day cycle on the old Mayan calendar), the family will prepare a special meal, and particular religious ceremonies are performed to bring good luck to the child.

(1)

Bueno,	q-e='ya[38]	tzalu',	at	jun	q-e='ya	nb'aj[39]	q-e
SP:okay	A1P-RN=LP	here	EXIST	INDF	A1P-RN=LP	custom	A1P-RN:DAT

oj	n-Ø-i'tz'-aj	jun	ne'	q-ku'waal=i
when.FUT	INC-B2/3S-be.born-PASS	INDF	CLF	A1S-child=LP

'Well, us here, we have a custom when a child of ours is born.'

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[37] Idiom: it was (made) known, lit. 'the idea/news went up'

[38] FPM uses the exclusive 1st person plural pronoun, as he is describing Mam customs to non-Mam linguists.

[39] While speakers translate *nb'aj* as 'custom', which I maintain in my choice of glossing here, it is probably a nominalzed form of the verb *n-Ø-b'aj* 'it is happening.'

(2) n-Ø-tzaj i'tz'-aj jun ne' q-ku'waal=i, n-Ø-xi'=tza
INC-B2/3S-DIR be.born-PASS INDF CLF A1S-child=LP INC-B2/3S-DIR=well

q-ii-n q-u'n=i t-u'j tne'l jun ne t-winaq jun
A1P-carry-DS A1P-RN:AGT=LP A2/3S-RN:IN first INDF CLF A2/3s-twenty INDF

ne ne'
CLF young.child
'When a child of ours is born, we take the baby through the first through the twentieth.'

(3) Ti' japanina?
what meaning
'What does this mean?'

(4) Oj n-Ø-tzaj i'tz'-aj jun ne' q-ku'waal=i,
When.FUT INC-B2/3S-DIR be.born-PASS INDF CLF A1S-child=LP

n-Ø-xi'=tza t-ii-n jun tne'l q'iij, kaab'a q'iij, *hasta*
INC-B2/3S-DIR=well A2/3S-carry-DS INDF first day second day SP:until

oj=xa n-Ø-ja=pa t-e t-winq'a[40] q'iij.
when.FUT=FC INC-B2/3S-go.up=arrive.there A2/3S-RN:PAT A2/3S-twenty day
'When a baby is born, it goes through the first day, the second day, until it arrives at the twentieth day.'

(5) Ti'=tza japanina jo'=wa?
what=well meaning truly=EMPH
'Well what does this mean?'

(6) *Como* lep-ch q-o='ya t-e t-witz q'iij t-e
SP:as follow-POS a1s-pron=lp a2/3s-rn:pat a2/3s-face day A2/3S-RN:PAT

t-witz q'iij t-e q-ajla-b'il=i, t-witz q'iij, t-e
A2/3S-face day A2/3S-RN:GEN A1S-count-NMLZ=LP, A2/3S-face day, A2/3S-RN:PAT

ootxa.
before
'We follow from day to day on our reckoning, "by the day", from the past.'

[40] There are two ways of saying 'twenty', *winq'a* and *winaq*. According to a different speaker, *winq'a* is the usual cardinal numer, wherea *winaq* is used for sets of 20.

(7)	Ja’la	nti’=tl	n-Ø-ajb’e-’n	q-e=’ya	t-witz	q’iij
	now	NEG.EXIST=other	INC-B2/3S-use-DS	A1S-RN=LP	A2/3S-face	day

‘Now we don’t go “by the day”[41]’.

(8)	*Pero*	ne’j	n-Ø-ajb’e-’n	t-e	winq’a	q’iij	jun	xjaw,
	SP:but	before	INC-B2/3S-use-DS	A2/3S-RN:PAT	twenty	day	INDF	month

t-e	winq’a	q’iij	jun	xjaw.
A2/3S-RN:PAT	twenty	day	INDF	month

‘But before, we reckoned 20 days to a month, 20 days to a month’

(9)	*Enton*,	oj=tza	n-Ø-i’tz’-aj	jun	ne’	ku’waal,
	SP:then	when.FUT=well	inc-b2/3s-be.born-PASS	INDF	CLF	child

n-Ø-xi’=tza	t-ii-n	jun	winq’a	q’iij,
INC-B2/3S-DIR=well	A2/3S-carry-DS	INDF	twenty	day,

n-Ø-ja=pa=tza	winq’a	q’iij,	n’-Ø-eel=tza	t-winaq,
INC-B2/3S-go.up=arrive.there=well	twenty	day	INC-B2/3S-go.out=well	A2/3S-twenty

qo-tchi=y	tzu’na	jo’=wa
a1p-say=LP	truly	yes=EMPH

‘So, when a child is born, they go through 20 days, until they reach the twentieth, so we say.’

(10)	N’-Ø-eel=tza	t-winaq	*y*	n-Ø-i’y=tza	jun
	INC-B2/3S-go.out=well	A2/3S-twenty	SP:and	INC-B2/3S-pass.by=well	INDF

ninq’iij[42]	q-u’n=i.
party	A2S-RN:AGT=LP

‘(The child) passes 20 (days) and we have a party.’

[41] This likely refers to the 20 days of the Mayan month/cycle, which each have their own names and corresponding customs (Oakes 1951). FPM is either referring to the *tzolk’in* calendar, which had 13 months of 20 days each (13 * 20 = 280), or the solar-based *haab’* calendar, which had 18 months of 20 days, with a nineteenth month of 5 remaining days (18 * 20 + 5 = 365). Today, the Gregorian calendar, with its 7-day week/cycle, is used throughout Guatemala, although the pre-Columbian calendars are still invoked occasionally, as this speaker comments.

[42] Compound of *nim* ‘big’ + *q’iij* ‘day’, meaning ‘party, celebration, festival’

(11)

n-Ø-tzaj=tza	q-chmo-'n	q-iib'=i	t-u'ya=ka	ne=ka
INC-B2/3S-DIR=well	A1S-gather-ds	A1S-self=LP	A2/3S-RN:COM=EMPH?	CLF=EMPH?

q-arman=i,	ne=ka	q-iitz=i,	ne	q-tzik=i	ch-u'ya=ka
A1S-relative=LP	CLF=EMPH?	A1S-child=LP	CLF	A1P-brother=LP	A2/3P-RN:COM=but

q-man=i,	ch-u'ya=ka	q-jii=y,	t-u'n
A1S-father=LP	A2/3P-RN:COM=EMPH?	A1S-in.law=LP	A2/3-RN:COMP

t-tzaj=tza	i'tz'-aj
A2/3S-DIR=well	be.born-PASS

'We gather together with our relatives, our children, our siblings, with our parents, with our in-laws, when (the child) is born.'

(12)

n-Ø-tzaj=tza	ch-q-eet=ka	t-u'n=tza	t-b'aj
INC-B2/3S-DIR=well	A2/3P-gather-PASS=but	A2/3S-RN:COMP=well	A2/3S-happen

jun	wa-'n.
INDF	eat-PRTC

'They gather together to make a meal.'

(13)

n-Ø-ku'=x	ne	chme'y,	at	maj	ja	chme'y
INC-B2/3S-DIR=DIR	CLF	turkey	EXIST	instance	DEM	turkey

n-Ø-tzaj	q-ii-n=i	t-e	t-b'eel	q-waa='ya.
INC-B2/3S-DIR	A1P-bring-DS=LP	A2/3S-RN:PAT	A1/2S-flavor	A1S-meal=LP

'Turkey is cooked, sometimes it's turkey we bring for our meal.[43]'

(14)

B'ix	at	maj	ne	*karnel*	n-Ø-tzaj	q-ii-'n=i
And	EXISt	instance	CLF	SP:sheep	INC-B2/3S-DIR	A1S-bring-DS-LP

t-e	t-b'eel	q-waa='ya.
A2/3S-RN:PAT	A1/2S-flavor	A1S-meal=LP

'And sometimes it's sheep we bring for our meal.'

(15)

n-Ø-tzaj	q-chmo-'n	q-iib'=i.
INC-B2/3S-DIR	A1S-gather-DS	A1S-self=LP

'We gather together.'

[43] In Todos Santos, and presumably elsewhere in the greater Maya Mam community, turkey is only eaten on the most special occasions. Speakers report that turkeys are more difficult to breed and take longer to mature than chickens, and are therefore more expensive and valued.

(16)

n-Ø-ku'=x=sa	jun	q-k'aa='ya,	ta'l	k'aa-b'j,	ti'=tza
INC-2/3S-DIR=DIR=EMPH	INDF	A1S-drink=LP	liquid	drink-NMLZ	what=well

japanina	ta'l	k'aa-b'j?
meaning	liquid	drink-NMLZ

'We also make a drink, *ta'l k'aab'j*, what does *ta'l k'aab'j* mean?'

(17)

Pues,	jun	ne	xtx'u'n	t-u'ya=tza	ne
SP:well	INDF	CLF	seed.of.mamey	A2/3S-RN:COM=well	CLF

pimien.
SP:pepper

'Well, it's some mamey seeds (*semilla de zapote*) with a little pepper.'

(18)

n-Ø-b'aj=sa	wi'ys-eet	jun	ne	xtx'u'n,	b'ix=sa
INC-B2/3-DIR=EMPH	sautée-PASS	INDF	CLF	seed.of.mamey	and=EMPH

n-Ø-e=x	tche'y-et,	b'ix=sa	n-Ø-ku'=x	t-u'j...
INC-B2/3S-DIR=DIR	grind-PASS	and=EMPH	INC-B2/3-DIR=DIR	A2/3S-RN/in

n-Ø-tzaj=tza	lokla,	b'ix=sa	n-Ø-xi'	q-q'o-'n=i	ta'l
INC-B2/3-DIR=WELL	boil	and=EMPH	INC-B2/3-DIR	A1S-give-DS=LP	liquid

k'aa-b'j	t-e	ta'l
drink-NMLZ	A2/3S-RN:PAT	atol

'We sautée the mamey seeds, and they get ground up and put in... well, they get boiled, and we bring out the *ta'l k'aab'j* as atol.'[44]

(19)

n-Ø-xi'=tza	q-q'o-'n=i	t-u'j	q-tz'ima=ni,	mii'n
INC-B2/3S-DIR=well	A1S-give-DS=LP	A2/3S-RN/in	A1P-type.of.cup=LP	NEG

ya'n	t-u'j	q-*bas*=i,	*sino*	t-u'j
NEG.STAT	A2/3S-RN/in	A1S-SP:cup=lp	SP:rather	A2/3S-RN/in

q-tz'im=ni
A1S-type.of.cup=LP

'We put it in our *tz'ma'* cups, not in our *vasos*, but rather in our *tz'ma'* cups.'[45]

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[44] Other atol drinks are consumed for various occassions, including one drunk daily during the colder months that is made of rice. The atol here called *ta'l k'aab'j*, literally 'the atol beverage,' is only drunk for particularly special occasions, such as the birth of a child or the end of the construction of a new home.

[45] A particular kind of cup used to drink atol, having a bottom shaped like a cone. FPM contrasts this with what he call *baso* – a loan from Spanish *vaso* 'cup' – which would be a typical mug or cup with a flat bottom.

(20) n-Ø-xa' jun ne q-k'aa=ya t-e jun tz'ma'
INC-B2/3S-give INDF CLF A1P-drink=LP A2/3S-RN:PAT INDF type.of.cup

t-e xjaal, *entonces* ja=tza tzu'n=ja n-Ø-ajb'e-'n
A2/3S-RN:PAT man, SP:then DEM=well yes=DEM INC-B23/S-use-PASS?
'Each person gets a *tz'ma'*, and that's what is used.'

(21) Ti'=tza japanina t-winq'a q'iij?
what=well meaning A2/3S-twenty day
'So what does the 20 days mean?'

(22) *Como* q-e='ya q-teen ne'j, t-e winq'a q'iij,
SP:as A1P-RN=LP A1P-method before A2/3S-RN:pat twenty day

n-qo ajla-n=a q-e='ya, ya'n t-e laj-laj q'iij.
INC-B1P count-AP=LP A1S-RN=LP NEG.STAT A2/3-RN:PAT ten-ten day
'So before, we counted by twenty days, not ten and ten.'

(23) *Sino* t-e winq'a q'iij n-qo ajla-n=a q-e='ya.
SP:rather A2/3S-RN:PAT twenty day INC-B1P count-AP=LP A1P-RN=LP
'But rather by twenty days we counted.'

(24) Ja=tza q-e='ya *calendario* t-e *segun* t-e
DEM=well A1P-RN=LP SP:calendar A2/3S-RN:PAT sp:second A2/3-RN:PAT

kaab'a q-e'=ya t-witz j=q'iij, q-ii-n q-u'n=i jun
two A1S-RN=LP A2/3-face DEM=day A1P-bring-DS A1S-RN:AGT=LP INDF

t-e nim b'ix jun t-e ch'in.
a2/3s-rn:pat large and indf a2/3s-rn:pat small
'That was our calendar, which followed two cycles, one long and one short[46].'

(25) At jun t-ook t-e q-chimlal=i, b'ix at jun
EXIST INDF A2/3S-go.in A2/3S-RN:PAT A1S-body=LP and EXIST INDF

t-ook t-e q-awa-l=i.
A2/3S-go.in A2/3S-RN:PAT A1S-plant-NMLZ=LP
'One (cycle) refers to our bodies, the other to the crops.'

[46] FPM is probably referring to the two calendar systems in synchronous use in pre-Columbian Mayan civilization, which are mentioned above: the shorter *tzolk'in* (280 days) and the longer *haab'* (365 days).

(26)

T-u’n	*pero*	qa	ma	tz’-e=x...	ja=tza	jun
A2/3S-RN:COMP	SP:but	if	PROX	A2/3S-DIR=DIR	DEM=well	INDF

q-i’tz=a	tz’-e=x	j=winq’a	q’iij,	japanina	jo’=wa
A1P-birth=LP	B2/3S-DIR=DIR	DEM=twenty	day	meaning	truly=EMPH

ma	qa	ee=x=a	t-witz	jun	q’iij	t-e	jun	q’iij,
PROX	B1P	go.out=go=LP	A2/3S-face	INDF	day	A2/3S-RN:PAT	INDF	day

at	t-ipumal	juun	q’iij	t-e	q-e=’ya	q-e.
EXIST	A2/3S-power	each	day	A2/3-RN:PAT	A1P-RN=LP	A1P-RN:DAT

‘But if we pass... well, when we are born and pass the twenty days, it means that we’ve gone from one day to the next, each day ha a meaning to us.’

(27)

At	japanina	juun	q’iij	q-e=’ya	q-e,	nya	nuq
EXIST	meaning	each	day	A1P-RN=LP	A1P-RN:DAT	NEG.INC	only

yaalx	ni’y	q-i’ysa-’n	q-e=’ya	ninq’iij,
trifling	when	A1P-celebrate-DS	A1P-RN=LP	party

sino	at	japanina	juun	q’iij	t-e	q-e=’ya
SP:rather	EXIST	meaning	each	day	A2/3S-RN:PAT	A1P-RN=LP

q-e.
A1P-RN:DAT

‘Each day has a meaning to us, it’s not a small thing when we have a party, but it’s rather that each day has a meaning to us.’

(28)

Oo=tza	qa	e=x	b’aj=i	t-witz	j=winq’a	q’iij,
COM=well	B1P	DIR=DIR	finish=LP	A2/3S-RN/face	DEM=twenty	day

joo’	tzuj	ni’y	jun	ninq’iij	q-chool=i.
truly	DEM	when	iNDF	party	A1S-RN/between=LP

‘So when we pass the twenty day, that’s truly when there is a party among us.’

(29)

Ja	tzuj	xuj	yaq’ol,	ja=tza	xuj	ja,	at	maaj
DEM	DEM	CLF	midwife	DEM=well	CLF	DEM	EXIST	instance

n’-Ø-el	t-ii-n	xuj	jun	ne...	t-su-’n	xuj
INC-B2/3S-DIR	A2/3S-carry	CLF	INDF	CLF	A2/3S-brush-DS	CLF

kob’	ne	ab’ech	t-e	q-wi=y,	b’ix	at	ja	n’-Ø-el
some	CLF	flower	A2/3S-RN:PAT	A1P-head=LP	and	EXIST	DEM	INC-B2/3S-DIR

t-su-’n	xuj	ne	*candela*	t-e	q-wi=y,
A2/3S-brush-DS	CLF	CLF	SP:candle	A2/3S-RN:PAT	A1P-head=LP

b’ix=sa	n-Ø-xi’	xuj	q’oo-l	ikxa	t-u’j
and=EMPH	INC-B2/3S-DIR	CLF	give-INF	like.this	A2/3S-in

t-ja’	*Dios*.
A2/3S-house	SP:God

‘A midwife, that’s the woman, sometime she’ll take...brush some flowers on our heads, or she brushes some candles on our head, and she takes it (the flowers or candle) to the church.

(30)

B’ix-qa	n-Ø-xi’	xuj	q’oo-l=ka=ta	t-u’j	jun	ne
And-if	INC-B2/3S-go	CLF	give-INF=EMPH?=DEF	A2/3S-in	INDF	CLF

k’oj-b’il	ja=tuma=la	t-b’an-il	t-u’j	t-witz
?-LOC	where=ENCL=DUB	A2/3S-good-NMLZ	A2/3S-in	A2/3S-face

xuj.
CLF

‘Or she’ll take it to some secret place that seems good to her.’

(31)

Jatz=tza	n-Ø-kw’-a’	n-q’o-’n	xuj	na’,	tzu’n,	xuj
there=well	INC-B2/3S-DIR=DIR	A1S-give-DS	CLF	prayer	truly	CLF

q-man	*Dios*	t-i’j	ne’	xjaal	aa’kaj,	ne	xjaal	ma
A1P-father	SP:God	A2/3S-RN:OBL	CLF	person	new	CLF	person	PROX

Ø-tzaj	i’tz-j.
B2/3S-DIR	be.born-PASS

‘There she offers prayers to God on behalf of the new person, the little person just born.’

(32)

Ja=tza	jun	q-e=’ya	qnab’	t-e	ootxa.
dem=well	indf	a1p-rn:gen=lp	tradition	a2/3s-rn:gen	before

‘This is an ancient tradition of ours.’

(33)	Ja=tza	jun	ne	*tradición*	n-Ø-ook.
	DEM=well	INDF	CLF	SP:tradition	INC-B2/3S-go.in
	‘This is a tradition that occurs.’				

2.3 Text 3: *Tne’l noviembre* (narrated by speaker ZC)

In this text, speaker ZC describes the customs surrounding the festival held annually in Todos Santos which culminates on November 1st, but also includes several days of celebration beforehand, and a gravesweeping ritual the day after. This festival, aligned with All Saints’ Day (Spanish: *Día de Todos los Santos*) is where the town of Todos Santos gets is name in Spanish (the Mam name for Todos Santos is *Kutx*[47]). The gravesweeping ceremony on November 2nd, in turn, is part of the observance of All Souls’ Day. This festival is famous in Guatemala for its ceremonial horse race (Mam: *Sqach Ko’* ‘The Game of the Rooster[48]’), which originated in protest to the Spanish colonial government’s historic restriction against Mayans riding horses.

Figure 21: Maya Mam men riding horses at the racetrack outside Todos Santos for the November 1st festival (Wikimedia Commons: user Yves Picq)

[47] *Kutx*, in turn, probably comes from the name of the mountain range in which Todos Santos is situated, *Sierra de los Cuchumatanes*.

[48] The name of the horse race event does not include the word for ‘horse’ (*tcheej*), but instead the word for ‘rooster’ (*ko’*). This refers to the ceremonial slaughter of a rooster by the lead rider in a group of participants. Speakers do, however, refer to the event in Spanish as *Carrera de Caballos* ‘The Running of the Horses.’

(1) K-xe’-l n-*contaara* *lo* *que* *es* t-q’iij q-tanma
B2/3S-DIR-POT A1S-SP:tell.DS SP:that SP:which SP:is A2/3S-day A1P-pueblo
‘I will tell what our pueblo’s day is.’

t-e ja tne’l t-e *noviembre...*
A2/3S-RN:PAT DEM first A2/3S-RN:PAT SP:November
‘I will tell what the “Day of our Pueblo” is on the first of November.’

(2) Ja tne’l t-e *noviembre* ja=tza jun t-q’iij
DEM first A2/3S-RN:PAT SP:Novemebr DEM=well CLF A2/3S-day

q-tanma n-Ø-b’aj tzalu’ t-u’j q-tanma
A1P-pueblo INC-B2/3S-happen here A2/3S-RN:OBL A1P-pueblo

Todos Santos Cuchumatán, t-u’j q-e=’ya q-tanma=wa,
SP:Todos Santos Cuchumatán A2/3S-RN/in A1P-RN=LP A1S-pueblo=EMPH

t-q’iij q-tanma.
A2/3S-day A1P-pueblo
‘On the first of November our pueblo’s day happens here, in our pueblo of Todos Santos Chuchumatán, in our pueblo here, the “Day of our Pueblo.”’

(3) Ya’n=tza t-e kaab’a t-ajla-l *noviembre*, ja=tza
AS.FOR=well A2/3S-RN:PAT two A2/3S-count-NMLZ SP:November DEM=well

ch-jaaw-il q-e q’iij anma, qa anma.
A2/3P-go.up-POT A1P-RN:DAT day soul, PL soul
‘As for the second day of November, we celebrate All Souls’ Day, the souls.’

(4) Ja=tza n-Ø-tzaj q-na-’n qa anma, qa j=anma o chi
DEM=well INC-B2/3S-DIR A1P-pray-DS PL soul, PL DEM=soul com b2/3s

b’aj.
die
‘We offer prayers to the souls, the souls that have died.’

(5) *Entonces* *practicamente*, *lo* *que* n-Ø-b’aj
SP:then SP:practically SP:that SP:which INC-B2/3S-happen

t-u’j tne’l t-e *noviembre...* ti’=tza=jela ch’in
A2/3S-RN/in first A2/3S-RN:GEN sp:November what=well=ENCL a.little

n-Ø-b’aj?
inc-b2/3s-happen
‘So practically, what happens on November 1st is... well what happens?’

(6) Nim=tza jun tzalaj-eb’ n-Ø-baj, nim=tza xjaal n-Ø-ayoo-n
a.lot=well INDF happy-NMLZ? INC-B2/3S-happen a.lot=well people INC-await-AP

t-i’j ninq’iij tzaaj-na tzaaj.
A2/3S-RN:OBL festival come-ADJ come
‘Well there’s a lot of happiness, a lot of people look forward to the festival as it gets closer.’

(7) N-Ø-xi’ k’uula=tza tcheej jun q’iij *antes*, kaab’a q’iij
INC-B2/3S-DIR find=well horse indf day SP:before two day

antes t-ajla-l *octubre*, oj n-qo b’aj
SP:before A2/3S-count-NMLZ SP:October when.FUT INC-B1S finish

octobre.
SP:october
‘The horses arrive a day before, two days before, in October, at the end of October.’

(8) Ja=tza n-Ø-xi’ k’uula qa tcheej t-u’n=tza ch-wa-’n
DEM=well INC-B2/3S-DIR find PL horse A2/3S-RN:COMP=well A2/3P-eat-DS

jel, t-u’n=tza ch-*preparar* jel.
CLF A2/3S-RN:COMP=well A2/3P-SP:prepare CLF
‘The horses arrive so they can feed, so they can prepare.’

(9) Ju’x qa q’a *jinete*, qa q’a *carel*-il chi eel=ix
same PL CLF SP:rider PL CLF SP:runner-NMLZ B2/3P go.out=go

t-iib’aj tcheej, jax chi b’aj ch-*preparar* ch-iib’=q’a,
A2/3S-RN/on horse also B2/3P DIR a2/3s-sp:prepare A2/3S-self=CLF

porque nim=k’a jun t-xileen juunjuun q-e=’ya
SP:because a.lot=emph INDF A2/3S-significance each A1S-RN=LP

q-ninq’iij.
A1P-festival
‘Same with the the riders and the runners who are on the horses, they prepare themselves, because each of our festivals has great significance.’

(10)

Nim=k'a	t-xileen	iil	t-i'j,	ya'n	nuq	jun
a.lot=EMPH	A2/3S-goings.on	problem	A2/3S-RN:OBL	NEG.STAT	only	INDF

rato,	k-jaw-il	t-*carrelil*	juun	ninq'iij	*porque*	ja=tza
SP:bit	B2/3S-DIR-POT	A2/3S-SP:ride	each	party	SP:because	DEM=well

jun	ninq'iij	nim	t-okleen	o	Ø-tzaj	chim
INDF	party	a.lot	A2/3S-meaning	COM	B2/3S-DIR	die

q-e'=ya	q-chman	ne'j.
A1P-RN=LP	A1P-ancestor	before

'There are a lot of goings-on that have to be done, it's not just one thing, they'll ride during each of these festivals because, a festival means a great deal to our ancestors who have died.'

(11)

Ja=tza	jun	teen	j=nim=k'a	ti=q'ch=la=jelil,	ne'
DEM=well	INDF	BE	DEM=a.lot=EMPH	what=FC?=DUB=PCL	CLF

costumbre	n-Ø-b'aj,	ne'=k'a	*familia*,	ne'=k'a	qa
SP:custom	INC-B2/3S-happen	CLF=EMPH	SP:family	CLF=EMPH	PL

q'a	k-xe'-l=ix	*careel-il*,	Ø-txi'	eel=ix.
CLF	B2/3S-DIR-POT=DIR	SP:race-INF	B2/3S-DIR	go.out=GO

'Thereare a lot of customs that take place, within the family, and those that ride, who go out (to ride).'

(12)

Entonces	ja	tzu'n=ja	nim	Ø-b'aj	*preparar*	t-iib'.
SP:then	DEM	DEM=DEM	a.lot	B2/3S-DIR	SP:prepare	A2/3S-self

'And so there's a lot to prepare.'

(13)

Nim=la	t-xileen,	*pero*	*más o menos*	alkee	j=w-e='ya
a.lot=DUB	A2/3S-significance	SP:but	SP:more or less	which	DEM=A1S-RN=LP

k-xe'-l	n-*contaara*	ja'la.
B2/3S-DIR-POT	A1S-tell.DS	today

'Lots of goings-on, but this is more or less what I'm going to tell today.'

(14)

Oj-tza	chi	k'uula=jel,	t-e	tzuj	*a las ocho*,
when.FUT=well	B2/3P	arrive=CLF	A2/3S-RN:PAT	DEM	SP:at.eight.o'clock

t-e	tne'l	*noviembre*,	ja=tzan	n-chi	ku'=x=jel
A2/3S-RN:GEN	first	SP:November	DEM=well	INC-B2/3P	go.down=go=CLF

t-u'n=tzan	ch-kub'a=jel.
A2/3S-RN:COMP=well	A2/3P-be.down=CLF

'When the horses arrive at eight o'clock on November 1st, they are led down.'

(15)

Q-q'aq=tza	chi	q'ii-n=tza	ch-e	t-u'j	*campo*,
A1S-say=well	B2/3P	take-AP=well	B2/3P-RN:PAT	A2/3S-RN:IN	SP:field,

jatz=tza	n-chi	kub'a=jel	t-u'n=tza	ch-aq'=jel
there=well	INC-B2/3P	be.down=CLF	A2/3S-RN:AGT=well	A2/3S-start=CLF

ajqal-il.
run-INF

'Let's say they arrive at the field, and there they're down to begin to race.'

(16)

B'ix	kuma	ya'n	jun=x	kloj=jel,	nim=k'a	kloj=jel,
and	because	NEG.STAT	INDF=ENCL	group=CLF	a.lot=EMPH	group=CLF

depende	t-i'j	tzu'n	qaj	q'a	*jinete*,	qa	q'a	*primer gallo*,
SP:it.depends	A2/3S-RN:OBL	truly	PL	CLF	SP:rider	PL	CLF	SP:first rooster

qa	q'a	*entera*	ne'	qa	q'a	xhini-n	*carrer-il*	t-iib'aj
PL	CLF	SP:all	CLF	PL	CLF	B2/3P+go-AP	run-INF	A2/3S-RN/on

tcheej.
horse

'And it's not just one group (of horses), it depends on the riders, the First Rooster, all those who will go ride horses.'[49]

(17)

Ja=tza	jun	*feria*	n-Ø-b'aj	tzalu'=wa	t-u'j
DEM=well	INDF	SP:festival	INC-B2/3S-happen	here=EMPH	A2/3S-RN/in

ne'	q-tanma	*Todos Santos Cuchumatán*.
CLF	A1P-pueblo	SP:Todos Santos Cuchumatán.

'This is a festival that happens here in our pueblo Todos Santos Cuchumatán.'

[49] The participants in the horse race are organized into groups, or teams. They prepare their own horses, and celebrate together in the lead-up to the festivities. The group leader or captain is called the *Primer Gallo* 'First Rooster,' since it is his responsibility to hold on to, and then ceremonially slaughter, a rooster at the end of the races.

(18) *Pero* kuma at=tza=la na’j *Dios* n-Ø-b’aj,
SP:but because EXIST=well=DUB prayer SP:God INC-B2/3S-happen

at=tza=la ti’=q’ch=jela xjaal n-chi naa’=xa *Dios*,
EXIST=well=DUB what=FC=ENCL man INC-B2/3P pray.AP=CLF SP:God

qa=xa ch-*familia* ne’=k’a alkee chi eel=ix *carrel*-il
PL=CLF B2/3P-SP:family CLF=EMPH which B2/3P go.out=go SP:run-INF

t-u’n mii’n chi b’aj=xa, t-u’n mii’n chi
A2/3S-RN:COMP NEG B2/3P die=CLF A2/3S-RN:COM NEG B2/3P

jelpaj=xa t-u’n mii’n chi chaj=xa t-jaq’
stumble=CLF A2/3S-RN:COMP NEG B2/3P remain=CLF A2/3S-RN/under

tcheej, t-u’n mii’n chi k’ub took=jel ne’ tcheej,
horse A2/3S-RN:COMP NEG B2/3P DIR break=CLF CLF horses

nim=k’a jun t-xileen j=lu.
a.lot=EMPH INDF A2/3S-significance DEM=DEM

‘But there’s a lot of praying to God that happens by the family of those that go out to race, so that they (the riders) don’t die, so that they don’t stumble, so that they don’t get stuck under the horse, so they don’t injure the horses, a lot of things happen.’

(19) *Entonces*, ja=tza jun w-e’=ya ma chin *contaara* ja’la...
SP:then DEM=well INDF A2S-RN=LP PROX B1S SP:tell today

‘Well, this is what I told today...’

(20) *Yo* *creo* *que* je=q’a *primer gallo*, j e=tza=q’a,
SP:I SP:I.believe SP:that DEM.3P=CLF SP:First Rooster DEM.3P=well=CLF

n-Ø-xi’ q’ii-n t-e jel ko’ t-u’j
INC-B2/3S-DIR carry-AP A2/3S-RN:PAT CLF rooster A2/3S-RN/in

ch-q’ab’=q’a.
A2/3P-arm=CLF

‘I think that, those who are *Primer Gallo* (First Rooster), them, they carry the rooster in their hands.’

(21) N-chi jaaw=xa=tza t-chi-l q’iij, t-u’n
INC-B2/3P go.up=CLF=well A2/3S-middle-NMLZ day A2/3S-RN:COMP

ch-jaaw=xa waa-l.
A2/3P-go.up=CLF eat-inf

‘They ride through midday, so they can eat.’

(22)

Ya’n=tza	oj	n-Ø-poon	qa’la,	q-q’aq
AS.FOR=well	when.FUT	INC-B2/3S-arrive.here	afternoon	A1P-let’s.say

las cinco de la tarde,	jwe’	t-ajlal	t-e
SP:at five in the afternoon	five	A2/3S-count	A2/3S-RN:GEN

qa’la,	ja=tza	n-chi	jaaw	qa	jel	tcheej.
afternoon	DEM=well	INC-B2/3P	go.up	PL	CLF	horse

‘Then when afternoon arrives, let’s say *las cinco de la tarde*, five o’clock in the afternoon, they (still) ride the horses.’

(23)

Pero	*antes*,	t-u’n	ch-jaaw=jel,	iil=tza
SP:but	SP:before	A2/3S-RN:COMP	A2/3P-be.up=clf	problem=well

t-i’j	n-Ø-jaw	ch-ii-n =q’a	jel	ko’	jaw-na,
2/3S-RN:PAT	INC-B2/3S-DIR	A2/3P-take-DS=CLF	CLF	rooster	be.up-ADJ

n-Ø-kub’=tza	ch-b’iyo-’n=q’a	jel	ko’.
INC-B2/3S-DIR=well	A2/3P-kill-DS=CLF	CLF	rooster

‘But before, they need hold up the rooster up, they kill the rooster.’

(24)

Ja=tza	n-Ø-tzaj=tza	ch-qb’a-’n	qa	q’a	*que*
DEM=well	INC-B2/3S-DIR=well	A2/3P-tell-DS	PL	CLF	SP:that

t-b’aj	tilil	ch-e=q’a	ch-*carrelil*	alkee
A2/3S-dir	end	A2/3P-RN:GEN=CLF	A2/3P-SP:running	who

j=ch-e=q’a	t-witz	ch-k’u’j.
DEM=A2/3P-RN=CLF	A2/3S-RN/on	A2/3P-stomach

‘With this, they signal that their race is over, which of them have that in mind.’

(25)

Ja	tzu’n=ja	n-Ø-b’aj	t-e	ja	ne	tne’l
DEM	truly=DEM	INC-B2/3S-happen	A2/3S-RN:PAT	DEM	CLF	first

t-ajla-l	*noviembre*.
A2/3S-count-NMLZ	SP:november

‘This is what happens on Novemeber 1^{st}.’

(26)	Oj=tza	n-Ø-b'aj	tilil	tne'l	t-ajla-l	*noviembre*,
	when.FUT=well	INC-B2/3S-DIR	end	first	A2/3S-count-NMLZ	SP:november,

at=tza=la	*baile*	n'-Ø-ook,	at=tza=la	ne
EXIST=well=dub	SP:dance	INC-B2/3S-go.out	EXIST=well=DUB	CLF

b'ix-b'il	n-Ø-b'aj	ch-e	qa=xi	po'r	ch-e	qa
dance-NMLZ	INC-B2/3S-happen	A2/3S-RN:PAT	PL=CLF	*po'r*	A2/3S-RN:PAT	PL

xjaal.
people
'When November 1st ends, perhaps there's a *baile*, perhaps there's a dance by the *po'r*[50], by the people.'

(27)	Ya'n=tza	t-kaab'	t-ajla-l	*noviembre*,	ja=tza
	as.for=well	A2/3S-second	A2/3S-count-NMLZ	SP:November	DEM=well

t-qi''j	chim-na.
a2/3s-day	die-ADJ

'As for November 2nd, it is the Day of the Dead.'

(28)	T-q'iij	chim-na,	ja=tza	lu	jun	n-Ø-b'aj	tilil
	A2/3S-day	die-NMLZ	DEM=well	here	INDF	INC-B2/3S-dir	end

t-u'j	*cementerio*.
A2/3S-RN/in	SP:cemetary

'The Day of the Dead finishes at the cemetary.'

(29)	N-chi	poon=xa	na'-l	t-e	qa	ne'	chim-na,
	INC-B2/3P	arrive.there=CLF	pray-INF	A2/3S-RN:PAT	PL	CLF	die-ADJ

ooq'-il	ch-iib'aj	qa	*familiar*=xa,	at=la	ch-txu'=xa,
cry-INF	A2/3S-RN/on	PL	SP:family=CLF	EXIST=DUB	A2/3P-mother=CLF,

at=la	ch-man=xa,	at=la	ch-a'l,	at=la
EXIST=DUB	A2/3P-father=CLF	EXIST=DUB	A2/3P-child	EXIST=DUB

ch-chmiil=xa,	at=la	ch-xu'l=xa	ma	Ø-b'aj.
A2/3P-husband=CLF	EXIST=DUB	A2/3P-wife=CLF	PROX	B2/3S-die

'They arrive there to pray for the dead, to cry over their family members, perhaps their mothers, fathers, children, husbands, or wives who have died.'

[50] According to a speaker, *po'r* refers to a particular kind of dancer who wears a colorful costume and a mask; these costumes are only brought out on November 1st.

(30) Ja=tza jun q'iij n-chi poon *visitar* qa
DEM=well INDF day INC-B2/3P arrive.there SP:visit PL

q-anma t-u'j *cementerio*.
A1P-soul A2/3S-RN/in SP:cemetary
'It's a day where they come to visit the souls in the cemetary.'

(31) N-chi b'aj b'in-t ne' qaj *pantión*, n'-Ø-ook
INC-B2/3P DIR make-PASS CLF PL SP:tombstone INC-B2/3S-go.out

ne' xtx'u'n t-i'j, n'-Ø-ook ch'in ne' t-k'a'.
CLF seed.of.mamey A2/3S-RN:PAT INC-B2/3S-go.out a.little CLF A2/3S-drink
'They prepare the tombstones, putting out *xtx'u'n*, something to drink.'

(32) N-Ø-b'aj b'in-t, n-Ø-jaaw=tl ch'in tz'is.
INC-B2/3S-DIR do-PASS INC-B2/3S-go.up=other a.little trash
'(When) it's done, they pick up trash.'

(33) Ja=tza n-chi pon kaana xjaal, nim xjaal.
DEM=well INC-B2/3P DIR reach.AP person a.lot person
'They finally arrive, people, a lot of people.'

(34) Ya'n ja t-e q'iij n-chi poon xjaal.
NEG.STAT DEM A2/3S-RN:GEN day INC-B2/3P arrive.there people
'It's not every day people go to there (to the cemetary).'

(35) At xjaal n-Ø-tzaaj=tza neq'ch, n-chi uul=tza xjaal
EXIST person INC-B2/3S-COME=well afar INC-B2/3P arrive.here=well people

t-u'j *cementerio* t-u'n=tza *recordar*, t-ni'y,
A2/3S-RN/in SP:cemetary A2/3S-RN:COMP=well SP:remember A2/3S-remember

t-u'n t-uul t-u'j ch-k'u'j qa
A2/3S-RN:COMP A2/3S-arrive.here A2/3S-RN/in A2/3P-stomach PL

ne'=k'a *familia*, al *familia* mii'n nti' tumil
CLF=EMPH SP:family who? SP:family NEG NEG.EXIST idea

t-u'ya ja=q'ch Ø-maqu'n=a qa ch-*familia*, ne'=k'a
A2/3S-RN:COM where=FC B2/3S-bury-PASS? PL A2/3P-SP:family CLF=EMPH

ch-man, ch-txu', ne' al=q'cha ch-a'l.
A2/3P-father A2/3P-mother CLf who=DISTR A2/3P-child

‘People come from far away, they come to the cemetary to *recordar*, to remember their family, family they don’t even know where they’re buried, their fathers, mothers, whatever children (they had).’

(36)

Ja=tza	jun	q’iij	*mera*,	jun	q’iij	nim,	*vaya sí*,
DEM=well	INDF	day	SP:more	INDF	DAY	big	SP:oh boy

acompañando=tza	t-u’ya	chnoob’,	n-Ø-poon=tza	chnoob’
SP:accompanied=well	A2/3S-RN:COM	marimba	INC-B2/3S-arrive.there=well	marimba

acompañar=tza	xjaal	t-u’n=tza	*alegre*	jun	q’iij,
SP:accompany=well	people	A2/3S-RN:COMP=well	SP:happy	INDF	day

t-u’n=pa	tzuj	nim	xjaal	n-Ø-k’aa-n	q’e’,
A2/3S-RN:COMP=INT	DEM	a.lot	people	INC-B2/3S-drink-AP	liquor

nim	xjaal	b’oolil,	nim	xjaal	n-Ø-xyaaj	t-u’j
a.lot	people	drunk	a.lot	people	INC-B2/3S-go.and.return	A2/3S-RN/in

iglesia.
SP:church

‘This is a great day, a great day indeed, oh boy, accompanied by the marimba, the marimba comes to accompany the people to celebrate the day, so that lots of people drink, a lot of people get drunk, a lot of people go to church.’

(37)

Nim=k’a	jun	n-Ø-b’aj	t-e	ja	q’iij	t-e
a.lot=EMPH	INDF	INC-B2/3S-haappen	A2/3S-RN:PAT	DEM	day	A2/3S-RN:PAT

q-tanma.
A1P-pueblo

‘A lot happens during our pueblo’s day.’

(38)

Ja=tza	jun	w-e=’ya	teen	qb’aa-n	t-e	ja	ne’
DEM=well	INDF	A1S-RN=LP	BE	tell-AP	A2/3S-RN:PAT	DEM	clf

q’iij	ja’la.
day	today

‘This is something I’ve told today.’

APPENDIX B

Experimental stimuli

Block 1

1) E xi’ t-mana’ xin b’inchal jel alemaj ewa
   ‘El constructor alquiló el animal ayer’
2) E xi’ t-mana’ xin tzalaj b’inchal jel manim alemaj ewa
   ‘El constructor feliz alquiló el gran animal ayer’

3) E tz’ok t-malo’ q’a xnaq’tzal ta’l narans ewa
   ‘El estudiante midió el jugo de naranja ayer’
4) E tz’ok t-malo’ q’a tzalaj xnaq’tzal tchyal ta’l narans ewa
   ‘El estudiante feliz midió el delicioso jugo de naranja dulce ayer’

5) E kub’ t-mayo’ xin b’inchal jel masat ewa
   ‘El constructor calmó al venado ayer’
6) E kub’ t-mayo’n xin tzalaj b’inchal jel siktnin masat ewa
   ‘El constructor feliz calmó el cansado venado ayer’

7) E kub’ t-b’incha’ xin b’inchal qa tamal ewa
   ‘El constructor hizo los tamales ayer’
8) E kub’ t-b’incha’ xin ntzalaj b’inchal qa b’a’nxix tamal ewa
   ‘El constructor feliz hizo los tamales deliciosos ayer’

9) E xi’ t-lamo’ xin xnaq’tzal jel b’alam ewa
   ‘El estudiante empujó el tigre ayer’
10) E xi’ t-lamo’ xin manim xnaq’tzal jel matij b’alam ewa
   ‘El estudiante grande empujó el tigre enorme’

11) E kub’ t-ayo’ xin b’inchal xuj yaq’ol ewa
   ‘El constructor esperaba a la comadrona ayer’
12) E kub’ t-ayo’ xin tzalaj b’inchal xuj chula yaq’ol ewa
   ‘El constructor feliz esperaba a la comadrona linda ayer’

13) E kub’ t-b’yo’n xin xnaq’tzal jel b’alam ewa
   ‘El estudiante mató el jaguar ayer’
14) E kub’ t-b’yo’n xin matij xnaq’tzal jel manim b’alam ewa
   ‘El estudiante grande mató el jaguar enorme ayer’

15) E tzaj t-tzyu’n xin k’ojlal qa xnaq’tzal ewa
   ‘El cuidador agarró a los estudiantes ayer’

16) E tzaj t-tzyu'n xin matij k'ojlal qa tzalaj xnaq'tzal ewa
'El cuidador grande agarró a los estudiantes felices ayer'

Block 2

1) E t-il xin k'ojlal jel b'alam ewa
'El cuidador vió el jaguar ayer'
2) E t-il xin tzalaj k'ojlal jel matij b'alam ewa
'El cuidador feliz vió el jaguar enorme ayer'

3) E t-il xin k'ojlal ta'l narans ewa
'El cuidador vió jugo de naranja ayer'
4) E t-il xin tzalaj k'ojlal cha'l ta'l narans ewa
'El cuidador feliz vió jugo de naranja dulce ayer'

5) Tajb'ee xin b'inchal ko'b' tamal ewa
'El constructor quería unos tamales ayer'
6) Tajb'ee xin tzalaj b'inchal ko'b' b'a'nxix tamal ewa
'El constructor feliz quería unos tamales deliciosos ayer'

7) T-ajb'ee xin b'inchal ta'l narans ewa
'El constructor quería jugo de naranja ayer'
8) T-ajb'ee xin ntzalaj b'inchal tchyal ta'l narans ewa
'El constructor feliz quería jugo de naranja dulce ayer'

9) T-tch'i' xin b'inchal ko'b' tamal ewa
'El constructor no quería unos tamales ayer'
10) T-tchi' xin tzalaj b'inchal ko'b' b'a'nxix tamal ewa
'El constructor feliz no quería unos tamales deliciosos ayer'

11) T-tch'i xin b'inchal ta'l narans ewa
'El constructor no quería jugo de naranja ayer'
12) T-tch'i xin tzalaj b'inchal cha'l ta'l narans ewa
'El constructor feliz no quería jugo de naranja dulce ayer'

13) Ttzqi'n xin xnaq'tzal xuj yaq'ol ja txix jnab'a
'El esudiante conoció a la comadrona el año pasado'
14) Ttz'qi'n xin tzalaj xnaq'tzal xuj b'anxix yaq'ol ja txix jnab'a
'El estudiante feliz conoció a la comadrona linda el año pasado'

15) Tzqi'n xin k'ojlal xin xnaq'tzal ja txix jnab'a
'El supervisor conoció al estudiante el año pasado'
16) tzqi'n xin ntzalaj k'ojlal xin matij xnaq'tzal ja txix jnab'a
'El supervisor feliz conoció al estudiante grande el año pasado'

Block 3

1) E tzaj chim xin b’inchal ewa
   ‘El constructor se desmayó ayer’
2) E tzaj chim xin siktnin b’inchal ewa
   ‘El constructor cansado se desmayó ayer’

3) E jax laq’e xin b’inchal tu’j aq’untl ewa
   ‘El constructor subió al mejor puesto ayer’
4) E jax laq’e xin tzalaj b’inchal tu’j aq’untl ewa
   ‘El constructor feliz subió al mejor puesto ayer’

5) ul meltz’aj xin xnaq’tzal ewa
   ‘El estudiante volvió ayer’
6) ul meltz’aj xin tzalaj xnaq’tzal ewa
   ‘El estudiante feliz volvió ayer’

7) E jaw maje xuj naa yaq’ol ewa
   ‘La comadrona se casó ayer’
8) E jaw maje xuj b’anxix naa yaq’ol ewa
   ‘La comadrona se casó ayer’

9) E tzaj tza’b’e’ xin xnaq’tzal ewa
   ‘El estudiante respondió ayer’
10) E tzaj tza’b’e’ xin tzalaj xnaq’tzal ewa
   ‘El estudiante respondio ayer’

11) E jaw lipa xin b’inchal ewa
   ‘El constructor saltó ayer’
12) E jaw lipa xin manim b’inchal ewa
   ‘El constructor grande saltó ayer’

13) E xi’ yo’la xin k’ojlal ewa
   ‘El cuidador llamó ayer’
14) E xi’ yo’la xin tzalaj k’ojlal ewa
   ‘El cuidador feliz llamó ayer’

15) E jaw tz’aq xin b’inchal ewa
   ‘El constructor callo ayer’
16) E jaw tz’aq xin matij b’inchal ewa
   ‘El constructor grande callo ayer’

Block 4

1) E ximan xin b’inchal ewa
   ‘El constructor pensó ayer’
2) E xima xin tzalaj b’inchal ewa
   ‘El constructor feliz pensó ayer’

3) E meq’t xin xnaq’tzal ewa
   ‘El estudiante se calentó ayer’
4) E meq’t xin siktnin xnaq’tzal ewa
   ‘El estudiante cansado se calentó ayer’

5) E sh’ich’a xin b’inchal ewa
   ‘El constructor fumó ayer’
6) E sh’ich’a xin siktnin b’inchal ewa
   ‘El construcor cansado fumó ayer ’

7) E yaqa xin b’inchal ewa
   ‘El constructor bromeó ayer’
8) E yaqa xin siktnin b’inchal ewa
   ‘El constructor bromeó ayer’

9) E siwa xin k’ojlal ewa
   ‘El cuidador recogio leña ayer’
10) E siwa xin manim k’ojlal ewa
   ‘El cuidador grande recogio leña ayer’

11) E yo’la xin k’ojlal ewa
   ‘El supervisor habló ayer’
12) E yo’la xin tzalaj k’ojlal ewa
   ‘El supervisor feliz habló ayer’

13) E tz’-aq’anan xin b’inchal ewa
   ‘El constructor trabajó ayer’
14) E tz’-aq’anan xin tzalaj b’inchal ewa
   ‘El constructor feliz trabajó ayer’

15) E tz’-ajlan xuj naa yaq’ol ewa
   ‘La comadrona descansó ayer’
16) E tz’-ajlan xuj b’anxix naa yaq’ol ewa
   ‘La comadrona buena descansó ayer’

APPENDIX C

List of abbreviations

The following is an alphabetized list of the glossing abbreviations used for Mam data. For other language's glossing conventions, please refer to the cited source.

A	Set A (ergative/possessive) prefix
ADJ	adjectivizer
AFF	assertive enciltic
AGT	agentive
AP	antipassive (intransitive) suffix
B	Set B (absolutive) prefix
BEN	benefactive
CLF	noun classifier
COM	completive aspect; also comitative
CØM	null completive aspect
COMP	complementizer
DAT	dative
DEM	demonstrative pronoun
DIR	directional auxiliary
DIST	distal aspect
DISTR	distributive
DS	directional (transitive) suffix
DUB	dubitative enclitic
ENCL	enclitic
EMPH	emphatic clitic
EXCL	exclusive
FC	free choice
GEN	genitive
INC	incompletive aspect
INCL	inclusive
INF	infinitive
INST	intrumental
INT	interrogative enclitic
LP	local person enclitic

NEG	negator
OBL	oblique patient
P	plural
PASS	passive
PAT	patient
POT	potential aspect
PRON	tonic pronoun
PROX	proximate aspect
Q	polar question enclitic
REL	relativizer
RN	relational noun
S	singular
SP	Spanish loan
UNPOSS	unpossessed inalienable noun suffix
VERS	versive (inchoative)
1	first person
2/3	second/third person
ω	prosodic word
φ	phonological phrase
ι	intonational phrase
$\exists$	existential operator
$\forall$	universal operator

References

Acker, A. M. (2016). *Voice and Valence in Q'anjob'al*. Ph.D. dissertation, University of California, Los Angeles.

Adler, J., Foley, S., Pizarro-Guevara, J., Sasaki, K., & Toosarvandani, M. (2018). The derivation of verb initiality in Santiago Laxopa Zapotec. *A reasonable way to proceed: Essays in honor of Jim McCloskey*, 31-49.

Aissen, J., England, N. C., & Zavala, R. M. (eds) (2017). *The Mayan languages*. Taylor & Francis.

Aissen, J. (1987). *Tzotzil Clause Structure*. Reidel: Dordrecht.

Aissen, J. L. (1992). Topic and focus in Mayan. *Language*, *68*(1), 43-80.

Aissen, J. (1997). On the syntax of obviation. *Language*, *73*(4), 705-750.

Aissen, J. (1999). Agent focus and inverse in Tzotzil. *Language*, 451-485.

Aldridge, E. (2002). Nominalization and wh-movement in Seediq and Tagalog. *Language and Linguistics*, *3*(2), 393-426.

Aldridge, E. (2004). Ergativity and word order in Austronesian languages. Ph.D. dissertation, Cornell University.

Aldridge, E. (2008a). Generative approaches to ergativity. *Language and Linguistics Compass* 2, 966–95.

Aldridge, E. (2008b). Phase-based account of extraction in Indonesian. *Lingua* 118, 1440–69.

Alsafi, A. A. H. (2017). Intonational Phrasing in Modern Standard Arabic with Reference to English. *Al-Adab Journal* 121, 1-39.

Alsager, H. N. (2020). The syntax of yes/no questions in Modern Standard Arabic. *International Journal of English Linguistics*, *10*(5), 179-189.

Assmann, A., Georgi, D., Heck, F., Müller, G., & Weisser, P. (2015). Ergatives move too early: On an instance of opacity in syntax. *Syntax*, *18*(4), 343-387.

Avelino, H. (2011). Intonational patterns of topic and focus constructions in Yucatec Maya. In *New perspectives in Mayan linguistics* (pp. 56-79). Cambridge: Cambridge Scholars Publishing.

Baker, M. (1985). The mirror principle and morphosyntactic explanation. *Linguistic Inquiry* 16(3), 373-415.

Beckman, M. E., & Ayers-Elam, G. (1997). Guidelines for ToBI labelling, version 3. Ms., Ohio State University.

Beckman, M. E., & Pierrehumbert, J. B. (1986). Intonational structure in Japanese and English. *Phonology*, *3*, 255-309.

Beckman, M. E., & Hirschberg, J. (1994). The ToBI annotation conventions. Ms., Ohio State University.

Beckman, J., J. Hirschberg, & S. Shattuck-Hufnagel (2005). The original ToBI system and the evolution of the ToBI framework. In In *Prosodic typology: The phonology of intonation and phrasing*, ed. by S.-A. Jun, 9-54. Oxford: Oxford University Press.

Bellik, J., Itô, J., Kalivoda, N., & Mester, A. (2022). Matching and alignment. *Prosody and prosodic interfaces*, 457-80.

Bellik, J., & Kalivoda, N. (2019). Automated tableau generation using spot (syntax-prosody in Optimality Theory). *Linguistics Vanguard*, *5*(1), 20170051.

Bennett, R., & Elfner, E. (2019). The syntax–prosody interface. *Annual Review of Linguistics*, *5*, 151-171.

Bennett, R. (2018). Recursive prosodic words in Kaqchikel (Mayan). *Glossa*, *3*(1), 1-33.

Bennett, R., Coon, J., & Henderson, R. (2016). Introduction to Mayan linguistics. *Language and Linguistics Compass*, *10*(10), 455-468.

Bennett, R., Elfner, E., & McCloskey, J. (2019). Prosody, focus, and ellipsis in Irish. *Language*, *95*(1), 66-106.

Berinstein, A. (1991). The role of intonation in K'ekchi Mayan discourse. In *Texas linguistic forum 32* 1-19). Austin: Department of Linguistics and the Center for Cognitive Science, The University of Texas.

Béjar, S. (2003). *Phi-syntax: A theory of agreement*. Ph.D. dissertation, University of Toronto.

Bittner, M. (1994). *Case, scope, and binding*. Dordrecht: Kluwer.

Boersma, P. & Weenink, D. (2023). Praat: doing phonetics by computer [Computer program]. Version 6.4.01, retrieved from http://www.praat.org/

Bohnemeyer, J. (2017). Organization of space. *The Mayan languages*, 327-347.

Booij, G. (1996). Cliticization as prosodie integration: The case of Dutch. *The Linguistic Review*, *13*, 219- 242.

Bošković, Ž, & Nunes, J. (2007). The copy theory of movement. *The copy theory of movement*, *107*, 13.

Bošković, Ž. (2001). *On the nature of the syntax-phonology interface: Cliticization and related phenomena*. Amsterdam: Elsevier Science.

Bricker, V. R. (1977). Pronominal inflection in the Mayan languages. *Tulane University Occasional Papers* 1, 1-28.

Brinkerhoff, M. L., J. Duff, & M. W. Cavallaro (2021). "Downstep in Santiago Laxopa Zapotec and the prosodic typology of VSO languages." Presented at the 2021 Manchester Phonology meeting, 26 May 2021.

Brodkin, D. (2021). Two Steps to High Absolutive Syntax. MA thesis, University of California, Santa Cruz.

Brodkin, D. (2023). The prosody of the extended VP. Ms., UC Santa Cruz.

Brown, C. (2021). A preliminary investigation of Sm'algyax intonation. Ms., University of California, Los Angeles.

Bruce, G. (1977*). Swedish word accents in sentence perspective*. Lund: Gleerup.

Canger, U. R. (1969). *Analysis in outline of Mam, a Mayan language*. Ph.D. dissertation, University of California, Berkeley.

Chávez-Peón, M. E., & Mudzingwa, C. (2008). The Syntax of Modal Auxiliaries in Tlacolula Valley Zapotec. In *Memorias del Congreso de Idiomas Indígenas de Latinoamérica (CILLA) III*.

Chen M. (1987). The syntax of Xiamen tone sandhi. *Phonology* 4,109–50.

Chomsky, N. & M. Halle (1968). *The Sound Pattern of English*. New York: Harper & Row.

Chomsky, N. (1995). *The Minimalist Program*. Cambridge, MA: MIT Press.

Chomsky, N. (2001). Derivation by phase. In *Ken Hale: A Life in Language*, ed. by M. Kenstowicz, 1-52. Cambridge, MA: MIT Press

Chung, S., & McCloskey, J. (1987). Government, barriers, and small clauses in Modern Irish. *Linguistic inquiry*, *18*(2), 173-237.

Clemens, L., & J. Coon (2018). Deriving verb-initial word order in Mayan. *Language*, *94*(2), 237-280.

Clemens, L., & J. Coon (2016). Deriving Mayan V1: A Fresh Look at Chol. Society for the Study of the Indigenous Languages of the Americas (SSILA), Portland, Oregon.

Clemens, L., & R. Tollan (2021). Syntactic ergativity as absolutive. *Polynesian syntax and its interfaces*, 89.

Clemens, L., and M. Polinsky (2017). Verb-initial word orders, primarily in Austronesian and Mayan languages. *The Wiley Blackwell companion to syntax*, 2nd edn., ed. by Martin Everaert and Henk van Riemsdijk. Hoboken, NJ: Wiley-Blackwell.

Clemens, L. (2014a). The prosody of Niuean pseudo noun incorporation: A recursion-based analysis. In *Proceedings of the 44th Meeting of the North East Linguistic Society* (pp. 69-82). Amherst, MA): Graduate Student Linguistic Association.

Clemens, L. E. (2014b). *Prosodic noun incorporation and verb-initial syntax*. Ph.D. dissertation, Harvard University.

Clemens, L. (2016). ARGUMENT-φ: A prosodic account of pseudo noun incorporation. In *Proceedings of the 46th Meeting of the North East Linguistic Society*, 217-226.

Clemens, L. (2019). Prosodic noun incorporation: The relationship between prosody and argument structure in Niuean. *Syntax*, *22*(4), 337-377.

Clemens, L. (2021). The use of prosody as a diagnostic for syntactic structure: The case of verb-initial order. *Parameters of predicate fronting*, 63-95.

Cohen, A. and J. t' Hart (1967). On the anatomy of intonation. *Lingua* 19, 177–192.

COLIMAM (2010). Pujb'il Yol Mam: Diccionario bilingüe Mam-Español. Guatemala: ALMG.

Collins, J. N. (2017). Samoan predicate initial word order and object positions. *Natural Language & Linguistic Theory*, *35*, 1-59.

Connell, B. (2011). Downstep. *The Blackwell companion to phonology*, 1-24. Wiley-Blackwell.

Coon, J., N. Baier,, & T. Levin (2021). Mayan agent focus and the ergative extraction constraint: Facts and fictions revisited. *Language*, *97*(2), 269-332.

Coon, J., Pedro, P. M., & Preminger, O. (2014). The role of case in A-bar extraction asymmetries: Evidence from Mayan. *Linguistic Variation*, *14*(2), 179-242.

Coon, J., & Preminger, O. (2013). Severing differential subject marking from ergativity. In *Workshop on Differential Subject Marking and Ergativity, at the 46th Annual Meeting of the Societas Linguistica Europaea (SLE 2013),* Split University, Croatia.

Coon, J. (2010a). *Complementation in Chol (Mayan): A theory of split ergativity*. Ph.D. dissertation, Massachusetts Institute of Technology.

Coon, J. (2010b). VOS as predicate fronting in Chol. *Lingua* 120(2), 354-378.

Coon, J. (2013). *Aspects of split ergativity*. Oxford; Oxford University Press.

Cooper, W. E., Paccia-Cooper J. (1980). *Syntax and Speech*. Cambridge, MA: Harvard University Press.

Craig, C. G. (1977). *The Structure of Jacaltec*. Austin: University of Texas Press.

Custis, T. (2004). Word Order Variation in Tongan: a Syntactic Analysis. Ph.D. dissertation, University of Minnesota.

Dayley, J. P. (1983). Voice and ergativity in Mayan languages. Ms., Boise State University.

Deal, A. R. & J. Royer (in prep.) Mayan animacy hierarchy effects: A dynamic interaction approach. Ms., UC Berkeley.

de Lacy, P. (2004). Maximal Words and the Maori Passive. *Optimality Theory in Phonology: A Reader*, ed. by J. J. McCarthy, 495–512. Malden, MA: Blackwell.

DiCanio, Christian & Ryan Bennett. 2018. *Prosody in Mesoamerican languages.* In C. Gussenhoven & Y. Chen (eds.), *The Oxford Handbook of Language Prosody*. Oxford, UK: Oxford University Press.

Diesing, M. (1992). *Indefinites*. Cambridge, MA: MIT Press

Dobashi, Y. (2003). *Phonological phrasing and syntactic derivation*. Ph.D. dissertation, Cornell University.

Doner, J. M. (2019). *The EPP across languages*. Ph.D. dissertation, University of Toronto.

Downing, L. J., Mtenje, A., & Pompino-Marschall, B. (2004). Prosody and information structure in Chichewa. *ZAS Papers in Linguistics*, *37*, 167-186.

Dufter, A., & Gabriel, C. (2016). 14 Information structure, prosody, and word order. *Manual of grammatical interfaces in Romance*, *10*, 419.

Duncan, P. T. (2017). The role of argument structure in Me'phaa verbal agreement. Ph.D. dissertation, University of Kansas.

Elfner, E. (2012). Syntax-prosody interactions in Irish. Ph.D. dissertation, Umass Amherst.

Elfner, E. (2015). Recursion in prosodic phrasing: Evidence from Connemara Irish. *Natural Language & Linguistic Theory*, *33*, 1169-1208.

Elkins, N. & Brown, C. (forthcoming). Headless relative clauses in Mam. *Proceedings of the Workshop on the Structure and Constituency in Languages of the Americas (WSCLA) 2023.*

Elkins, N., & Kuo, J. (2023). A prominence account of the Northern Mam weight hierarchy. In *Proceedings of the Annual Meetings on Phonology 10*.

Elkins, N. (2023). “The *lu*-progressive in Todos Santos Mam.” Presented at the Society for the Study of Indigenous Languages of the Americas (SSILA), 20-22 January.

Elordieta, G. (2007). Minimum size constraints on intermediate phrases. In Proceedings of the 16th International Congress of the Phonetic Sciences (ICPhS XVI), ed. J. Trouvain, W.J. Barry, 1021–24. London: International Phonetic Association

Elordieta, G. (2015). Recursive phonological phrasing in Basque. *Phonology*, *32*(1), 49-78.

England, N. C. (1976a). The Development of the Mam Person System. *International Journal of American Linguistics 42*, 259–261.

England, N. C. (1976b). Mam directionals and verb semantics, 201–211. Los Angeles: University of California American Indian Studies Center.

England, Nora C. (1978). Space as a Mam grammatical theme. *Papers in Mayan linguistics*, 225–38.

England, N. C. (1980). Eating in Mam, a Mayan language. *Journal of Mayan Linguistics* 1.

England, N. C. (1983a). Ergativity in Mamean (Mayan) languages. *International Journal of American Linguistics*, *49*(1), 1-19.

England, N. C. (1983b). *A Grammar of Mam, a Mayan Language*. Austin: University of Texas Press.

England, N. C. (1988). Mam voice. In *Passive and voice*, 525-546. John Benjamins.

England, N. C. (1989). Comparing Mam (Mayan) Clause Structures: Subordinate versus Main Clauses. *International Journal of American Linguistics 55*, 283–308.

England, N. C. (1990). El Mam: semejanzan y diferencias regionales. In *Lecturas Sobre La Linguistica Maya*, 221–254. La Antigua Guatemala: Centro de Investigaciones Regionales de Mesoamerica.

England, N. C. (1991). Changes in basic word order in Mayan languages. *International Journal of American Linguistics*, *57*(4), 446-486.

England, Nora C. 2004. Adjectives in Mam. In Adjective classes: A cross-linguistic typology, ed. by R.M.W. Dixon and Alexandra Aikhenvald, 125–146. Oxford: Oxford University Press.

England, N. C. (2007). Marking aspect and mood and inferring time in Mam (Mayan). In *Annual Meeting of the Berkeley Linguistics Society*, *33*, 119–140.

England, N. C. (2011). Plurality Agreement in Some Eastern Mayan Languages. *International Journal of American Linguistics* 77:397–412.

England, N. C. (2013a). Cláusulas con flexión reducida en Mam, 277–303. Mexico: Centro de Investigación y Estudios Superiores en Antropología Social.

England, N. C. (2013b). Los usos y funciones de los marca dores ‘ergativos’ (Juego A) en Mam (Maya). Ms., Austin, TX.

England, N. C. (2017). Mam. In The Mayan Languages, ed. by J. Aissen, N. C. England, and R. Z. Maldonado, 500–532. Routledge.

England, N. C. (1983b). *A Grammar of Mam, a Mayan Language*. Austin: University of Texas Press.

England, N. C., & Baird, B. O. (2017). Phonology and phonetics. In *The Mayan languages*, 175-200. Routledge.

Ershova, K. (to appear). Phasehood as defective intervention: posessor extraction and selective DP islandhood in West Circassian. *Syntax*.

Féry, C., & Truckenbrodt, H. (2005). Sisterhood and tonal scaling. *Studia linguistica*, *59*(2-3), 223-243.

Féry, C. (2007). The prosody of topicalization. *On information structure, meaning and form*, 69-86.

Féry, C. (2010). *German intonational patterns* (Vol. 285). Walter de Gruyter.

Fougeron, C., & Keating, P. A. (1997). Articulatory strengthening at edges of prosodic domains. *The journal of the acoustical society of America*, *101*(6), 3728-3740.

Fox, D. (1999). Reconstruction, binding theory, and the interpretation of chains. *Linguistic inquiry*, *30*(2), 157-196.

Frota, S. (2012). Prosodic structure, constituents and their implementation. In *The Oxford Handbook of Laboratory Phonology*, ed. by A. Cohn, C. Fougeron & M .Huffman, 255–65. Oxford, UK: Oxford Univ. Press

Gallagher, G., & Coon, J. (2009). Cooccurrence restrictions, similarity, and correspondence in Chol (Mayan). In *Proceedings of NELS 38*. GLSA Publications.

García Matzar, P. O., & Rodríguez Guaján, J. O. (1997). *Rukemik ri kaqchikel chi': Gramática kaqchikel.* Guatemala: Cholsamaj.

Ghini, M. (1993). Phi-formation in Italian: A new proposal. *Toronto working papers in linguistics*, *12*(2).

Godfrey, T. (1981). Grammatical categories for spatial reference in the western Mam dialect of Tacana. Ph.D. dissertation, UT Austin.

Goldberg, L. M. (2005). *Verb-stranding VP ellipsis: A cross-linguistic study*. McGill University.

Gussenhoven C. (2004). *The Phonology of Tone and Intonation*. Cambridge, UK: Cambridge University Press.

Gussenhoven, C., & Teeuw, R. (2008). A moraic and a syllabic H-tone in Yucatec Maya. *Fonología instrumental: Patrones fónicos y variación*, 49-71.

Halpert, C. (2019). Raising, unphased. *Natural Language & Linguistic Theory*, *37*(1), 123-165.

Hammarström, H. & Forkel, R., Haspelmath, M., & Bank, S. (2023). Glottolog 4.8. Leipzig: Max Planck Institute for Evolutionary Anthropology. https://doi.org/10.5281/zenodo.8131084.

Han, C.-H. (2000). *The Structure and interpretation of Imperatives: Mood and Force in Universal Grammar*. New York: Garland.

Hayes, B. (1989). Compensatory lengthening in moraic phonology. *Linguistic inquiry*, *20*(2), 253-306.

Hayes, B., & Lahiri, A. (1991). Bengali intonational phonology. *Natural Language & Linguistic Theory*, *9*, 47-96.

Heaton, R. (2016). Variation and change: The case of movement verbs in Kaqchikel. *International Journal of American Linguistics*, *82*(3), 317-352.

Hedding, Andrew A., and Michelle Yuan (2023). Phase unlocking and the derivation of verb-initiality in San Martín Peras Mixtec. In *Proceedings of WCCFL 41*. Somerville, MA: Cascadilla Press.

Henderson, R. (2012). Morphological alternations at the intonational phrase edge: The case of K'ichee'. *Natural Language & Linguistic Theory*, *30*, 741-787.

Hiraiwa, K. (2005). Dimensions of symmetry in syntax: Agreement and clausal architecture. Ph.D. dissertation, Massachusetts Institute of Technology.

Holmberg, A. 1986. *Word order and syntactic features in the Scandinavian languages and English*. Ph.D. dissertation, University of Stockholm.

Hopkins, N. A. (1967). A short sketch of Chalchihuitan Tzotzil. *Anthropological Linguistics*, *9*(4), 9-25.

Ishihara, S., & Kalivoda, N. (2022). Match Theory: An overview. *Language and Linguistics Compass*, *16*(1), e12446.

Ishihara, S. (2007). Major phrase, focus intonation, and multiple spell-out (MaP, FI, MSO). *The Linguistic Review* 24: 137–167.

Imanishi, Y. (2014). *Default ergative*. Ph.D. dissertation, Massachusetts Institute of Technology.

Inkelas, S., & Zec, D. (eds.). (1990). *The phonology-syntax connection*. University of Chicago Press.

Inkelas, S. (1989). Prosodic Constituency in the Lexicon. PhD dissertation, Stanford University.

Inkelas S. (1990). *Prosodic Constituency in the Lexicon*. New York: Garland

İşsever, S. (2003). Information structure in Turkish: the word order–prosody interface. *Lingua*, *113*(11), 1025-1053.

Itô, J. & A. Mester (1992/2003). Weak layering and word binarity. *A New Century of Phonology and Phonological Theory: A Festschrift for Professor Shosuke Haraguchi on the Occasion of his Sixtieth Birthday*, 268-274.

Itô, J., & A. Mester. (2007). Prosodic Adjunction in Japanese Compounds. In *Formal Approaches to Japanese Linguistics* 4, 97–111. Cambridge, MA: MIT Working Papers in Linguistics.

Itô, J., & Mester, A. (2009a). The extended prosodic word. *Phonological domains: Universals and deviations*, *1*, 135-194.

Itô, J., & Mester, A. (2009b). The onset of the prosodic word. *Phonological argumentation: Essays on evidence and motivation*, *227*, 260.

Itô, J. & A. Mester (2017). In Honma, Takeru, Masao Okazaki, Toshiyuki Tabata and Shin-ichi Tanaka, eds. *A New Century of Phonology and Phonological Theory. A Festschrift for Professor Shosuke Haraguchi on the Occasion of His Sixtieth Birthday.* 26-65.

Jun, S. A., & Fougeron, C. (2000). A phonological model of French intonation. In *Intonation: Analysis, modelling and technology*, 209-242). Dordrecht: Springer Netherlands.

Jun, S.-A (1993/1996). *The Phonetics and Phonology of Korean Prosody: intonational phonology and prosodic structure*, Garland Publishing Inc., New York: NY.

Jun, S.-A. (1998). The accentual phrase in the Korean prosodic hierarchy. *Phonology*, *15*(2), 189-226.

Jun, S.-A. (2000). K-ToBI (Korean ToBI) labelling conventions. *Speech Sciences*, *7*(1), 143-170.

Jun, S.- A. (2003). Prosodic phrasing and attachment preferences. *Journal of psycholinguistic research* 32, 219-249.

Jun, S.-A. (Ed.). (2005a). *Prosodic typology: The phonology of intonation and phrasing*. Oxford, UK: Oxford University Press.

Jun, S.-A. (2005b). Korean Intonational Phonology and Prosodic Transcription. In *Prosodic Typology: The Phonology of Intonation and Phrasing*, ed. by S.-A. Jun, 201-229. Oxford: Oxford University Press

Jun, S.-A. (ed.). 2014. Prosodic typology II: the phonology of intonation and phrasing. Oxford, UK: Oxford University Press.

Kabak, B., & Revithiadou, A. (2009). An interface approach to prosodic word recursion. *Phonological domains: Universals and deviations*, 105-133.

Kager, R. (1989). *A Metrical Theory of Stress and Destressing in English and Dutch*. Dordrecht: Foris.

Kahnemuyipour, A. (2003). Syntactic categories and Persian stress. *Natural Language & Linguistic Theory*, *21*(2), 333-379.

Kaisse, E. (1985). *Connected speech: the interaction of syntax and phonology*. New York: Academic Press.

Kalivoda, N. (2018). *Syntax-prosody mismatches in Optimality Theory*. Ph.D. dissertation, University of California, Santa Cruz.

Kaufman, T. (1976). New Mayan languages in Guatemala: Sacapultec, Sipacapa, and others. *Mayan linguistics*, *1*, 67-89.

Kentner, G., & Féry, C. (2013). A new approach to prosodic grouping. *The Linguistic Review*, *30*(2), 277-311.

Kentner, K. H. (2006). Size Restrictions in Prosodic Morphology. Ph.D. dissertation, Cambridge University.

Khan, S. D. (2008). Intonational phonology and focus prosody of Bengali. Ph.D. dissertation, University of California, Los Angeles.

Kratzer, A. & E. Selkirk (2007). Phase theory and prosodic spellout: the case of verbs. *The Linguistic Review 24*, 93-135.

Kubozono, H. (1989). Syntactic and rhythmic effects on downstep in Japanese. *Phonology*, *6*(1), 39-67.

Kubozono, H. (1993). *The Organization of Japanese Prosody*. Tokyo: Kurosio

Kuo, J., & Elkins, N. (2022). Phonetic realization of vowel length and glottalization in Todos Santos Mam. In *182nd meeting of the Acoustical Society of America. Denver, CO. May*, 23-27).

Kügler, F., & Skopeteas, S. (2006). Interaction of lexical tone and information structure in Yucatec Maya. In *Tonal Aspects of Languages*, 380-388. La Rochelle, France.

Kügler & Skopeteas (2007). Encoding information structure in Yucatec Maya: On the interplay of prosody and syntax. *Interdisciplinary Studies on Information Structure* 8:187-208

Kayne, R. S. (1994). *The antisymmetry of syntax* (Vol. 25). MIT press.

Kügler, F., S. Skopeteas & E. Verhoeven (2007). Encoding information structure in Yucatec Maya: on the interplay of prosody and syntax. *Interdisciplinary Studies on Information Structure* 8, 187-208

Ladd, D. R. (1986). Intonational phrasing: the case for recursive prosodic structure. *Phonology, 3*, 311-340.

Ladd, D. R. (1988). Declination 'reset' and the hierarchical organization of utterances. *Journal of the Acoustical Society of America 84*, 530– 44.

Ladd, D. R. (1993). On the theoretical status of 'the baseline' in modelling intonation. *Language and Speech* 36(4), 435-451.

Ladd, D. R. (2008). *Intonational Phonology*. Cambridge, UK: Cambridge University. Press.

Laenzlinger, C. (2005). French adjective ordering: perspectives on DP-internal movement types. *Lingua 115*, 645-689.

Lamarche, J. (1991). Problems for N^0-movement to NumP. *Probus 3*(2), 215-236.

Larsen, T. W. (1981). Functional correlates of ergativity in Aguacatec. In *Annual Meeting of the Berkeley Linguistics Society* 7, 136–153.

Larsen, T. W. (1988). Manifestations of ergativity in Quiché grammar. Ph.D. dissertation, University of california, Berkeley.

Law, D. (2014*). Language contact, inherited similarity and social difference: The story of linguistic interaction in the Maya lowlands*. Amsterdam: John Benjamins.

Lee, F. (2006). *Remnant raising and clausal architecture in San Lucas Quiavini Zapotec*. Dordrecht: Springer Netherlands.

Lee, F. A. (1999). Antisymmetry and the syntax of San Lucas Quiaviní Zapotec. Ph.D. dissertation, University of California, Los Angeles.

Liberman, M., and J. Pierrehumbert (1984). Intonational Invariance under Changes in Pitch Range and Length. *In Language Sound Structure*, ed. by by M. Aronoff and R. Oerhle, 157–233. Cambridge, MA: MIT Press.

Liberman, M. (1975). The intonational system of English. Ph.D. dissertation, Massachusetts Institute of Technology.

Lillehaugen, B. D., & Munro, P. (2006). Prepositions and relational nouns in a typology of component part locatives. In *LSA annual meeting, Albuquerque*.

Little, C. R. (2020a). Left branch extraction, object shift, and freezing effects in Tumbalá Ch'ol. *Glossa: a journal of general linguistics*, *5*(1).

Little, C. R. (2020b). *Mutual dependencies of nominal and clausal syntax in Ch'ol*. Ph.D. dissertation, Cornell University.

Lyskawa, P., & Ranero, R. (2022). Optional agreement as successful/failed Agree: Evidence from Santiago Tz'utujil (Mayan). *Linguistic Variation*, *22*(2), 209-267.
Otaki, K., Sugisaki, K., Yusa, N., & Koizumi, M. (2019). Two routes to the Mayan VOS: From the view of Kaqchikel. *Gengo Kenkyu*, *156*, 25-45.
Major, T., & Mayer, C. (in press). A phonological model of Uyghur intonation. In Jun, S.-A. and Khan, S.D. (Eds), *Prosodic Typology III.*
Massam, D. (2000). VSO and VOS: Aspects of Niuean Word Order. In *The Syntax of Verb-Initial Languages*, ed. by A. Carnie & E. Guilfoyle. New York: Oxford University Press, 97-116.
Massam, D. (2001). Pseudo noun incorporation in Niuean. *Natural Language & Linguistic Theory* 19(1), 153-197.
Massam, D. (2010). V1 or V2?: On the left in Niuean. *Lingua* 120(2), 284-302.
Mayo, C., Aylett, M., & Ladd, D. R. (1997). Prosodic transcription of Glasgow English: An evaluation study of GlaToBI. Proceedings from the: *ESCA Workshop on Intonation: Theory, Models and Applications*, Athens, Greece, 231-234
McCarthy, J. J., & Prince, A. (1993). Generalized alignment. In *Yearbook of morphology 1993*, 79-153. Dordrecht: Springer Netherlands.
McCawley, J. D. (1968). Concerning the base component of a transformational grammar. *Foundations of language*, 243-269.
McCloskey, J. (1991). Clause Structure, Ellipsis and Proper Government in Irish. In *The Syntax of Verb-Initial Languages*, ed. by J. McCloskey, 259-302.
McCloskey, J. (1996). On the scope of verb movement in Irish. *Natural Language & Linguistic Theory*, *14*(1), 47-104.
McCloskey, J. (2005). A note on predicates and heads in Irish clausal syntax. *Verb first: On the syntax of verb-initial languages*, 155-174.
McGinnis, M. (2008). Applicatives. *Language and Linguistics Compass*, *2*(6), 1225-1245.
Medeiros, D. J. (2013). Hawaiian VP-remnant movement: A cyclic linearization approach. *Lingua*, *127*, 72-97.
Mohammad, M. A. (2000). *Word order, agreement, and pronominalization in standard and Palestinian Arabic.* Philadelphia, PA: John Benjamins Publishing Company.
Mora-Marín, D. F. (2003). Historical reconstruction of Mayan applicative and antidative constructions. *International journal of American linguistics*, *69*(2), 186-228.
Munro, P. (2012). The grammaticalization of prepositions in Q'anjob'al. In *International Congress of Americanists, Symposium* (Vol. 932).
Munson, L. (1984). To Qyool: A reference grammar of Western Mam. Ph.D. dissertation, University of California, San Diego.
Myers, S. and Hansen, B. B. (2007). The origin of vowel length neutralization in final position: Evidence from Finnish speakers. *Natural Language & Linguistic Theory*, 25:157–193.
Myrberg, S. (2013). Sisterhood in prosodic branching. *Phonology*, *30*(1), 73-124.
Myrberg, S. (2010). The intonational phonology of Stockholm Swedish. Ph.D. dissertation, Acta Universitatis Stockholmiensis.

Nespor, M. & I. Vogel (I986). *Prosodic phonology*. Dordrecht: Foris.
Nevins, J. (2011). Multiple agree with clitics: person complementarity vs. omnivorous number. *Natural Language & Linguistic Theory 29*, 939-971.
Newell, H., & Piggott, G. (2014). Interactions at the syntax–phonology interface: Evidence from Ojibwe. *Lingua*, *150*, 332-362.
Nielsen, K. (2005). Kiche intonation. *UCLA working papers in phonetics*, *104*, 45-60.
Noguchi, M. (2012). A preliminary study of intonation in Kwak'wala. *UC Berkeley Working Papers in Linguistics* 33, 77-90.
Norman, W. M., & Campbell, L. (1978). Toward a Proto-Mayan syntax: a comparative perspective on grammar. *Papers in Mayan linguistics*, *2*, 136-155.
Nunes, J. (1995). The Copy Theory of Movement and Linearization of Chains in the Minimalist Program. Ph.D. dissertation, University of Maryland.
Nunes, J. (2004). *Linearization of chains and sideward movement*. MIT press.
Oakes, M. (1948). *The Two Crosses of Todos Santos: Survival of Mayan Religious Ritual*. Bollingen Series XXVII. New York: Pantheon.
Odden, D. (1987). Kimatuumbi phrasal phonology. *Phonology*, *4*, 13-36.
Otsuka, Y. (2000). Ergativity in Tongan. Ph.D. dissertation, University of Oxford.
Otsuka, Y. (2005). Two Derivations of VSO: A Comparative Study of Niuean and Tongan. In *Verb First: On the Syntax of Verb-Initial Languages*, ed. by A. Carnie, H. Harley & S. A. Dooley, 65-90. Amsterdam: John Benjamins.
Ouhalla, J. (1994). Verb movement and word order in Arabic. *In Verb Movement*, ed. by D. Lightfoot & N. Hornstein, 41-72. Cambridge: Cambridge University.
Pak, M. (2008). *The postsyntactic derivation and its phonological reflexes*. Ph. D. dissertation, University of Pennsylvania.
Palancar, E. L. (2004). Verbal morphology and prosody in Otomi. *International journal of American linguistics*, *70*(3), 251-278.
Parkinson, D. B. (1981). VSO to SVO in Modern Standard Arabic: A study in diglossia syntax. *al-'Arabiyya*, 24-37.
Peng, S. H., Chan, M. K., Tseng, C. Y., Huang, T., Lee, O. J., & Beckman, M. E. (2005). Towards a Pan-Mandarin system for prosodic transcription. In *Prosodic typology: The phonology of intonation and phrasing*, ed. by S.-A. Jun, 230-270. Oxford: Oxford University Press.
Peperkamp, S. A. (1997). *Prosodic words* (Vol. 34). The Hague: Holland Academic Graphics.
Pérez, E. & O. Jiménez (1997). *Ttxhoolil qyool mam: gramática mam*. Guatemala: Cholsamaj.
Pérez Vail, J. R. (2007). Xtxolil yool b'a'aj: Gramática Tektiteka. Guatemala: Cholsamaj.
Pérez Vail, J. R. (2014). La inversión y obviación en el mam de Cajolá. MA thesis, Centro de Investigaciones y Estudios Superiores en Antropología Social.
Pearce, E. (2002). VP versus V raising in Māori. In *Proceedings of the Eighth Meeting of the Austronesian Formal Linguistics Association*, eds. A. Rackowski & N. Richards, 225-240. Cambridge, MA: MIT Working Papers in Linguistics.

Pierrehumbert J, Beckman M. (1988). *Japanese Tone Structure*. Cambridge, MA: MIT Press.

Pierrehumbert, J., & Hirschberg, J. (1990). The meaning of intonational contours in the interpretation of discourse. In P. Cohen, J. Morgan, & M. Pollack (Eds.), *Intentions in communications*. Cambridge, MA: MIT Press.

Pierrehumbert, J. B. (1980). The Phonetics and phonology of English intonation. Ph.D. dissertation, Massachusetts Institute of Technology.

Pike, K. L. (1945). *The Intonation of American English.* Ann Arbor: University of Michigan Press.

Prieto, P. (2005). Syntactic and eurhythmic constraints on phrasing decisions in Catalan. *Studia Linguistica*, *59*(2-3), 194-222.

Price, P. J., Ostendorf, M., Shattuck-Hufnagel, S., & Fong, C. (1991). The use of prosody in syntactic disambiguation. *the Journal of the Acoustical Society of America*, *90*(6), 2956-2970.

Prieto, P. (2005). Syntactic and eurhythmic constraints on phrasing decisions in Catalan. *Studia Linguistica*, *59*(2-3), 194-222.

Prieto, P. (2014). The intonational phonology of Catalan. *Prosodic typology*, *2*, 43-80.

Prince, A. & P. Smolensky (1993/2004). *Optimality Theory: Constraint Interaction in Generative Grammar*. Oxford: Blackwell.

Pylkkänen, L. (2002). Introducing arguments. Ph.D. dissertation, Massachusetts Institute of Technology.

Quizar, S. (1979). Comparative word order in Mayan. Ph.D. dissertation, University of Colorado.

Rackowski, A.& N. Richards (2005). Phase edge and extraction: A Tagalog case study. *Linguistic Inquiry* 36, 565-599.

Richards, N. (2016). *Contiguity theory* (Vol. 73). MIT Press.

Richards, N. (2017). Some notes on Tagalog prosody and scrambling. *Glossa: a journal of general linguistics*, *2*(1).

Rotenberg, J. (1978). *The Syntax of Phonology*. Cambridge, MA: MIT Press.

Ross, J. R. (1974). Three batons for cognitive psychology. In: *Cognition and the Symbolic Processes*. W.B. Weimer and D.S. Palermo (eds.). Hillsdale, NJ: Lawrence Erlbaum Associates.

Royer, J. (2019). Domain restriction and noun classifiers in Chuj. In *NELS 49: Proceedings of the forty-ninth annual meeting of the North-East Linguistics Society*, ed. by. M. Baird & J. Pestesky, 3, 87–97.

Royer, J. (2021). Prosody as syntactic evidence: The view from Mayan. *Natural Language & Linguistic Theory*, 1-46.

Royer, J. (2022). Elements of (in)definiteness and binding: A Mayan perspective. Ph.D. dissertation, McGill University.

Sabbagh, J. (2014). Word order and prosodic-structure constraints in Tagalog. *Syntax* 17(1), 40-89.

Sabbagh, J. (2015). Intonation, adjunction, and verb-initial word order in Tagalog. Ms., UT Arlington.

Samuels, B. (2009). The third factor in phonology. *Biolinguistics*, *3*(2-3), 355-382.

Scheer, T. (2012a). Chunk definition in phonology: prosodic constituency vs. phase structure. *Modules and interfaces*, 221-253.

Scheer, T. (2012b). *Direct interface and one-channel translation* (Vol. 68). Walter de Gruyter.

Scott, T. & H. Sales (2021). Object licensing in San Juan Atitán Mam. Presented at the 6th meeting of Form and Analysis in Mayan Linguistics (FAMLi6). Chiapas, Mexico.

Scott, T. (2020a). Inclusivity in Mam morphosyntax. Poster presented at 94th meeting of the Linguistics Society of America. New Orleans, LA.

Scott, T. (2020b). Pronominal licensing in Mam. In *NELS 50: Proceedings of the Fiftieth Annual Meeting of the North East Linguistic Society*, ed. by M. Asatryan, Y.-X. Song, and A. Whitmal, 3, 127–140.

Scott, T. (2023). Pronouns and agreement in San Juan Atitán Mam. Ph.D. dissertation, UC Berkeley.

Seidl, A. (2001). Minimal Indirect Reference: A Theory of the Syntax–Phonology Interface. London: Routledge

Selkirk, E. (1974). French liaison and the X notation. *Linguistic inquiry*, 573-590.

Selkirk, E. (1978). *On Prosodic Structure and its Relation to Syntactic Structure*. Bloomington: Indiana University Press.

Selkirk, E. (1984). *Phonology and Syntax: The Relation between Sound and Structure.* Cambridge, MA: MIT Press.

Selkirk, E. (1986) On derived domains in sentence phonology. *Phonology* 3, 371-405.

Selkirk, E. (1995). Sentence prosody: Intonation, stress and phrasing. In *The Handbook of Phonological Theory*, ed. by J. A. Goldsmith, 550 – 569, Oxford: Blackwell.

Selkirk, E. (2000). The interaction of constraints on prosodic phrasing. In *Prosody: Theory and Experiment: Studies Presented to Gösta Bruce* (pp. 231-261). Dordrecht: Springer Netherlands.

Selkirk, E. (2009). On clause and intonational phrase in Japanese: The syntactic grounding of prosodic constituent structure. *Gengo Kenkyu* 136, 35-74.

Selkirk, E. (2011). The syntax-phonology interface. *The handbook of phonological theory*, 435-484.

Shattuck-Hufnagel, S., & Turk, A. E. (1996). A prosody tutorial for investigators of auditory sentence processing. *Journal of psycholinguistic research*, *25*, 193-247.

Silverman, K. E., Beckman, M. E., Pitrelli, J. F., Ostendorf, M., Wightman, C. W., Price, P., Pierrehumbert, J., & Hirschberg, J. (1992, October). ToBI: A standard for labeling English prosody. In *ICSLP* (Vol. 2, pp. 867-870).

Simon, M. (2019). *A Phonetic Distance Approach to Intelligibility between Mam Regional Dialects* MA thesis, San Jose State University.

Sitler, R. (2002). Mam notes for Todos Santos Cuchumatán. Ms., Stetson University. Available on-line at: http://www.stetson.edu/~rsitler/TodosSantos/

Smith Stark, T. (1988). 'Pied-piping' con inversión en preguntas parciales. Ms., Centro de estudios lingüísticos y literarios, Colegio de México y Seminario de lenguas indígenas.

Soltan, U. (2007). *On formal feature licensing in minimalism: Aspects of Standard Arabic morphosyntax*. Ph.D. dissertation, University of Maryland, College Park.

Sproat, R. (1985). Welsh syntax and VSO structure. *Natural Language & Linguistic Theory*, 173-216.

Staubs, R., M. Becker, C. Potts, P. Pratt, J. J. McCarthy & J. Pater (2010). OT-Help 2.0. [Software package.] Amherst, MA: University of Massachusetts Amherst.

Svenonius, P. (2004). On the edge. In *Peripheries: Syntactic edges and their effects*, 259-287. Dordrecht: Springer Netherlands.

Tada, H. (1993). *A/A-bar partition in derivation*. Ph.D. dissertation, Massachusetts Institute of Technology.

Tenny, Carol. L. (2000). Core events and adverbial modification. *Events as grammatical objects*, 285-334.

Tokizaki, H. (2008). Symmetry and asymmetry in the syntax-phonology interface. *Phonological Studies*, *11*, 123-130.

Truckenbrodt, H. (1995). *Phonological phrases--their relation to syntax, focus, and prominence.* Ph.D. dissertation, Massachusetts Institute of Technology.

Truckenbrodt, H. (1999). On the relation between syntactic phrases and phonological phrases. *Linguistic inquiry*, *30*(2), 219-255.

Tyler, M. (2019). Simplifying MATCH WORD: Evidence from English functional categories. *Glossa: a journal of general linguistics*, *4*(1).

Wagner, K. O. C. (2014). *An Intonational Description of Mayan Q'eqchi'*. MA thesis, Brigham Young University.

Wagner, M. (2005). *Prosody and recursion*. Ph.D. dissertation, Massachusetts Institute of Technology.

Wagner, M. (2010). Prosody and recursion in coordinate structures and beyond. *Natural Language & Linguistic Theory*, *28*, 183-237.

Waite, J. (1989). Tough- and Pretty-Movement in Māori. *Te Reo*, *32*, 61-94

Weir, A. (2012). Left-edge deletion in English and subject omission in diaries1. *English Language & Linguistics*, *16*(1), 105-129.

Werle, A. (2009). *Word, phrase, and clitic prosody in Bosnian, Serbian, and Croatian*. Ph.D. dissertation, University of Massachusetts Amherst.

Wexler, K. and P. Culicover (1977). Some syntactic implications of a theory of language learnability. In: *Formal Syntax*, ed. by P. Culicover, T. Wasow & A. Akmajian. New York: Academic Press

Wu, D. (2022). *Syntax and Prosody of Coordination*. Ph.D. dissertation, Massachusetts Institute of Technology.

Wu, D. (2021). Syntax of *either* in *either... or...* sentences. *Natural Language & Linguistic Theory 40*, 933-977.

Vaissière, J. (1991). Rhythm, accentuation and final lengthening in French. In *Music, Language, Speech and Brain: Proceedings of an International Symposium at the Wenner-Gren Center, Stockholm, 5–8 September 1990*, 108-120. Macmillan Education UK.

van Urk, C., & Richards, N. (2015). Two components of long-distance extraction: Successive cyclicity in Dinka. *Linguistic Inquiry*, *46*(1), 113-155.

Venditti, J. J. (2005). The J_ToBI model of Japanese intonation. In *Prosodic typology: The phonology of intonation and phrasing*, ed. by S.-A. Jun, 172-200. Oxford: Oxford University Press.

Vigário, M. (2010). Prosodic structure between the prosodic word and the phonological phrase: recursive nodes or an independent domain? *The Lingustic Review 27*, 485-530.

Vogel, I. (2009). Universals of prosodic structure. *Universals of language today*, 59-82.

Yuan, M. (2023). Two restrictions on pronominal clitics in San Juan Piñas Mixtec (Tò'on Nda'ví). Ms., University of California, San Diego.

Yuan, M. (2021). Diagnosing object agreement vs. clitic doubling: An Inuit case study. *Linguistic Inquiry* 52, 153-179

Zavala, R. (2007). Inversion and obviation in Mesoamerica. *Endangered languages*, 267-306.

Zavala, R. M. (2017). Alignment patterns. In *The Mayan Languages*, ed. by J. Aissen, N. C. England, and R. Z. Maldonado, 226–258. Routledge.

Zec, D. (2005). Prosodic differences among function words. *Phonology*, *22*(1), 77-112.

Zeijlstra, H. (2006). The ban on true negative imperatives. *Empirical issues in syntax and semantics*, *6*(1), 405-424.

Zheng, X.,and Pierrehumbert. J. B. (2010). The effects of prosodic prominence and position on duration perception. *The Journal of the Acoustical Society of America* 128(2), 851-859.