Little-v^0 Agreement and Templatic Morphology in Chol

Jessica Coon, McGill University

jessica.coon@mcgill.ca

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Abstract

This paper addresses typological differences in subject–verb agreement, and provides evidence that transitive subject agreement need not always involve a high functional head, i.e. T^0, but may instead be the result of a local relation between the subject and a low functional head, v^0. In Mayan languages, grammatical relations are head-marked on the predicate through two series of morphemes, known as "Set A" (ergative/possessive) and "Set B" (absolutive). I argue that Set A morphemes reflect a local relationship of agreement between transitive v^0 and the subject in its specifier position and, in an analogous structural configuration, between possessive n^0 and the possessor. Crucially, I show that no higher functional projection is involved. This is important in light of proposals that ergative agreement systems are epiphenomenal, resulting from standard nominative agreement from T^0 which is blocked from agreeing with morphologically case-marked ergative subjects (Woolford 2010). In this paper I examine the morphologically ergative Mayan language Chol to show true ergative agreement is possible even in the absence of morphological case. This paper has implications for the typology of ergative case and agreement systems, and contributes to our understanding of the nature of agreement and clitic doubling.

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1. Introduction

Mayan languages make use of two bound series of person/number morphemes to indicate grammatical relations (e.g. Dayley 1981). What are known in Mayanist literature as "Set A" morphemes, shown for Chol in (1), mark transitive subjects as well as possessors of nominals. I gloss these 'ERG' throughout.[1]

(1) a. Tyi **k**-mek'-e jiñi ñeñe'.
PRFV 1ERG-hug-TV DET baby
'I hugged the baby.'

b. **k**-otyoty
1ERG-house
'my house'

The "Set B" markers, mark absolutive arguments: the objects of transitive verbs, as in (2a), and the subjects of intransitive verbs, as in (2b). Arguments cross-referenced by Set A and B morphemes may be *pro*-dropped. There is no overt 3rd person Set B morpheme (see (1a), where the 3rd person object triggers no marking on the verb), discussed in section 3 below.

(2) a. Tyi y-il-ä-y-**ety**.
PRFV 3ERG-see-TV-EP-2ABS
'She saw you.'

b. Tyi ts'äm-i-y-**ety**.
PRFV bathe-ITV-EP-2ABS
'You bathed.'

In this paper I argue that in the verbal domain, Set A markers represent true *ergative agreement*, spelling out an *Agree* relation between a low functional head, transitive v^0 and the transitive subject; in the nominal domain, Set A marking is the result of an analogous structural configuration between n^0 and the possessor. Based on both morphophonological and syntactic evidence, I argue that finite

[1]Unless otherwise noted, Mayan data below are from the author's field notes. Abbreviations in glosses are as follows: ABS – absolutive; ACC – accusative; APPL – applicative; CL – noun class clitic; CLF – nominal classifier; DAT – dative; DET – determiner; DTV – derived/non-root transitive suffix; EP – epenthesis; ERG – ergative; FEM – feminine; IMP – imperative; IMPF – imperfective; ITV – intransitive verb suffix; MASC – masculine; NML – nominal; NOM – nominative; PERF – perfect; PL – plural; PRFV – perfective; SG – singular; TV – transitive verb suffix.

T^0/Infl^0 is not involved in the realization of ergative marking, a proposal which has consequences for theoretical accounts of case, agreement, and their interaction.

A careful investigation of agreement-only ergative languages (i.e. languages in which ergative alignment is realized only as dependent marking on predicates, not as morphological case on nominals), such as those in the Mayan family, is essential to our understanding of the range of ergative patterns cross-linguistically. The majority of research on ergativity has focused on languages with morphological case, and ergative agreement patterns have thus largely been discussed via their *interaction* with morphological case (see e.g. Bobaljik and Branigan 2006, Bobaljik 2008, Preminger 2009). Woolford (2000) takes an extreme stance, arguing that *all* agreement is in fact nominative-accusative agreement, and that the appearance of ergative agreement is always the result of the interaction with morphological case, or other factors, discussed below. Thus, according to this view, ergative agreement is secondary, arising only epiphenomenally through interaction with some other primary phenomenon.

This paper provides evidence that at least certain ergative agreement systems represent true ergative agreement—that is, transitive subjects trigger agreement through a relationship with a particular functional head (v^0), and distinctly from transitive objects and intransitive subjects. The existence of true ergative agreement has been proposed previously in the context of other work on languages languages with ergative agreement that lack morphological case, for example by Aissen 2010 for the Mayan language Tsotsil, and by Wiltschko 2006 for Halkomelem Salish. Here I add empirical support to these proposals and discuss the theoretical implications.

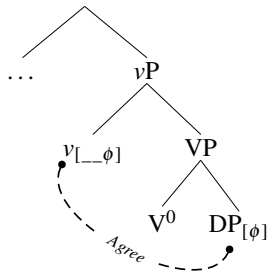
The remainder of this paper is organized as follows. In section 2 I present relevant background information, both empirical and theoretical. Section 3 turns to an overview of the two series of ϕ-indexing morphemes found in Mayan languages, with particular attention to Chol, a language of Chiapas, Mexico. Morphophonological and syntactic evidence for ergative agreement occurring low in the structure is presented in sections 4 and 5. Section 6 concludes.

2. Ergative case and ergative agreement

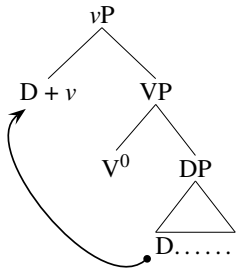
2.1 Agreement vs. clitics

There are at least two possibilities for the structural representation of bound ϕ- (person, number, gender) indexing morphemes such as the Mayan Set A and Set B markers above: they could be (i) agreement morphemes, or (ii) clitics. Following Chomsky 2000, Chomsky 2001, and much subsequent work, I take agreement morphemes to be the result of an *Agree* relationship between a probe with unvalued ϕ-features and a goal DP, illustrated in (3). The probe searches the derivation and when an Agree relation is established, the ϕ-features are valued and spelled out on the probe. Clitics, in contrast, are essentially small, morphologically bound pronouns. Under a movement approach to clitic-doubling, clitics are D^0 elements which move from inside a larger DP to attach to some verbal functional head such as T^0 (Anagnostopoulou 2003), v^0 (Nevins 2011), or F^0 (Uriagereka 1995) (see discussion in Kramer 2014; Harizanov 2014). This is schematized in (4).

(3) AGREEMENT



(4) CLITIC DOUBLING



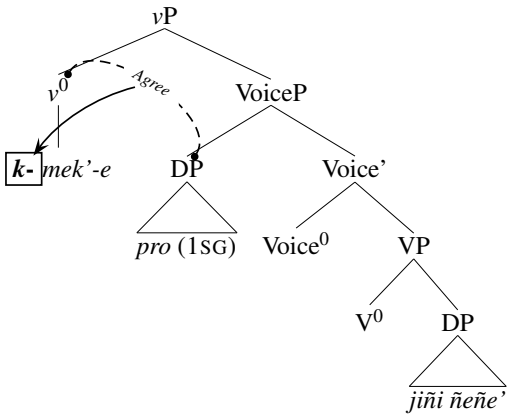
In this paper I argue that Chol utilizes both strategies: Set A markers are agreement markers, while Set B markers are clitics. In the verbal domain, I argue that the Set A markers spell out an agreement relationship between transitive v^0 and the low transitive subject, as shown in (5). Here the verb stem raises through Voice^0 to transitive v^0, acquiring the transitive "status suffix" *-e* (glossed 'TV' and proposed in Coon 2013 to be an instantiation of v^0).[2] The subject is introduced in the specifier of Voice^0 and the 1st person singular agreement marker *k-* is spelled out on the

[2]The transitive status suffix, *-V*, is harmonic with the root vowel, while the intransitive status suffix is uniformly *-i*. The exact label of these heads is not directly relevant to the discussion at hand; for example, nothing below rests on whether the relevant head is v^0 or Voice^0, or whether the agreement takes place between a specifier and its head, or in some other local configuration. While refinements may be required for the picture in (5), the main claim is simply that the licensing takes place low, and does not involve Infl^0 or T^0.

stem. Higher functional material is not involved in the licensing or agreement of ergative subjects, making (transitive) subject agreement in Chol very different from subject agreement in English.

(5) a. Tyi k-mek'-e jiñi ñeñe'.
PRFV 1ERG-hug-TV DET baby
'I hugged the baby.'

b.



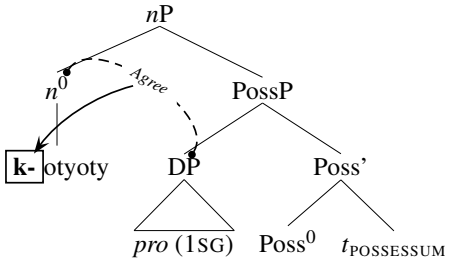
Note that following Coon et al. to appear, I represent *v*P (the projection containing the status suffix) as located above VoiceP (the projection responsible for introducing the transitive subject). This is consistent with the order of suffixes on the stem in accordance with the Mirror Principle (Baker 1985), discussed further in section 3 below.

Analogously, in the nominal domain, Set A in its possessive function is the spell-out of an agreement relation between the possessor and a functional nominal head, represented in (6). For parity with (5) above, I represent the possessor in the specifier of a projection, PossP, below the agreeing *n*P projection. I represent the possessum as having undergone head movement from its base position to n^0 (again, along the lines of the verb in (5)); certain types of possessive constructions require nominal suffixes, which may provide evidence for this analysis).[3] As above, nothing hinges on the details of the order or label of these projections. The main point is that Set A agreement is the reflex of a low *n*P-internal relationship.

[3]In section 4.4.1 below I show that the possessive marker may attach to a limited number of [Adj–N] sequences. I suggest these are the result of compounding, and thus not a problem for a head-movement analysis of the possessum.

(6) a. k-otyoty.
1ERG-house
'my house'

b.



Turning now to Set B morphology, I follow Coon et al. to appear in taking the functional projection responsible for the Set B absolutive clitics to vary within the Mayan family; in the terminology of Legate 2008, Mayan languages instantiate both absolutive=nominative ("ABS=NOM") and absolutive=default ("ABS=DEF") types of ergative systems. Chol falls into the latter category (Coon 2013; Coon et al. to appear). In Chol, transitive objects are licensed by v^0, while intransitive subjects are licensed by finite Infl^0, and absolutive clitics are a morphological default used to spell out both relationships. The proposal is summarized in (7).

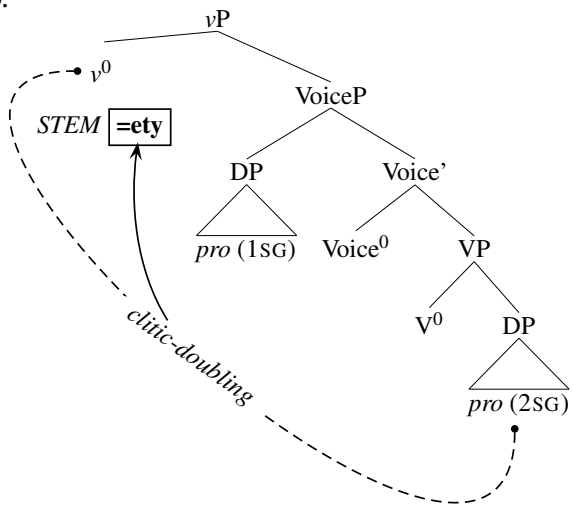
(7) PROPOSAL FOR CHOL

	TYPE OF ϕ MARKER	LOCUS
Set A	agreement	v^0 — transitive subjects
		n^0 — possessors
Set B	clitic	Infl^0 — intransitive subjects
		v^0 — transitive objects

A transitive example with a 2nd person absolutive object is shown in (8). Here transitive v^0 enters into an *Agree* relationship with the object, triggering a clitic double to appear on the v^0 head. The absolutive morpheme cliticizes to the complex verb stem located in v^0. Note transitive v^0 is responsible both for the absolutive clitic and the ergative agreement. Phonological differences in level of attachment, discussed in section 4 below, support the proposal here that ergative and absolutive morphemes arise as the result of different syntactic processes.

(8) a. Tyi k-mek'-e-y=**ety**.
PRFV 1ERG-hug-TV-EP=2ABS
'I hugged you.'

b.



Evidence that the 1st and 2nd absolutive morphemes cliticize to the verb stem in v^0 (rather than, for example, simply being located in object position) is provided by applicative double object constructions, like those in (9). When there are two 3rd person internal arguments, as in (9a), the order is THEME–GOAL. However, if the goal is 1st or 2nd person, the absolutive morpheme appears on the stem, preceding the THEME argument, as in (9b). Recall that there is no 3rd person absolutive morpheme.

(9) a. Tyi a-mel-be waj **jiñi alob**.
PRFV 2ERG-make-APPL tortilla DET boy
'You made the boy tortillas.'

b. Tyi a-mel-be-y=**oñ** waj.
PRFV 2ERG-make-APPL-EP=1ABS tortilla
'You made me tortillas.'

As noted above, the primary focus below is on the Set A ergative agreement markers, with Set B presented largely for contrast.

2.2 Two types of ergative agreement

If the proposal in (7) is correct—that ergative marking is agreement which takes place internal to *v*P—it has implications for our understanding of the relationships among abstract case (i.e. nominal licensing), morphological case, and morphological agreement. Specifically, morphological ergative agreement may arise in the absence of overt morphological case, and transitive subject agreement need not always reflect agreement from finite T^0/Infl^0, discussed in this section.

While some languages use only a single strategy (case or agreement) for marking grammatical relations, many languages exhibit a combination of the two. As shown in the table in (10), the alignment of case and agreement within a given language may match: English and Tamil have nominative-accusative systems of both morphological case and agreement, while Hindi and Kabardian can be characterized as having ergative-absolutive systems of case and agreement (table adapted from Woolford 2000). Some languages, such as Walpiri and Nez Perce, can be described as having an ergative-absolutive system of morphological case marking, yet agreement nonetheless follows a nominative-accusative pattern. However, the reverse situation has been claimed—at least since Anderson 1976 and Dixon 1979—to be unattested: there is no language with a nominative-accusative system of morphological case marking and an ergative-absolutive system of verbal agreement.[4]

(10)

CASE \ AGREEMENT	nominative-accusative	ergative-absolutive
nominative-accusative	English, Tamil	***unattested***
ergative-absolutive	Walpiri, Nez Perce	Hindi, Kabardian

In the case of Hindi-Urdu, both the case and agreement systems follow an ergative-absolutive pattern in the past perfect, as in (11). Here transitive subjects receive an ergative case marker

[4]Though see Patel 2006 for a potential counter-example from the Indo-Aryan language, Kutchi. In Kutchi, transitive objects can appear with morphological case marking ("accusative"), but agreement is with absolutive arguments. Crucially, however, the object marking is not available to *all* objects, but instead appears to be a case of Differential Object Marking. What sets apart Kutchi from e.g. Hindi-Urdu, then, is the fact (i) there is a system of abstract ergative Case assignment, but that eragtive is morphologically unmarked; and (ii) DOM case marking does not block agreement. I am grateful to Jonathan Bobaljik for discussion of these points.

-ne; transitive objects and intransitive subjects (absolutives) are morphologically unmarked for case. Verb agreement (realized on both the lexical verb and auxiliary, when present) is with the unmarked absolutive nominals.

(11) HINDI-URDU

a. Raam-**ne** roTii khaayii thii.
agree
Raam(MASC)-ERG bread(FEM) eat.PERF.FEM be.PAST.FEM
'Raam had eaten bread.'

b. Raam baazaar gayaa.
agree
Raam(MASC) market go.PAST.MASC.SG
'Raam went to the market.' (Mahajan 1990)

A closer examination of the agreement system of Hindi-Urdu, however, leads one to question whether a true ergative-absolutive agreement system is possible at all. Hindi-Urdu agreement shows a clear sensitivity to morphological case, and morphological case does not line up perfectly with grammatical function: when the transitive subject is in an unmarked absolutive form, as in the imperfective in (12), the verb agrees *not* with the object, as in (11a), but with the transitive subject. Agreement in Hindi-Urdu is then more accurately described as targeting the *highest morphologically unmarked nominal* (Kachru et al. 1976, Mohanan 1994).

(12) Raam roTii khaataa
agree
Raam(MASC) bread(FEM) eat.IMPF.MASC
'Raam used to eat bread.' (Mahajan 1990)

As Woolford (2000) and Bobaljik (2008) point out, this makes Hindi-Urdu agreement look very similar to agreement patterns in certain nominative-accusative languages, like Icelandic. In basic transitive constructions, Icelandic follows a nominative-accusative case marking pattern in which the verb agrees with the nominative subject, as in (13a). However, certain experiencer subjects are marked with dative case, as shown in (13b). Plural agreement with the dative subject in (13b) is impossible. Instead, the verb now agrees with the nominative object.

(13) ICELANDIC

a. Við lásum bókina
agree
we.NOM read.1PL the.book.ACC

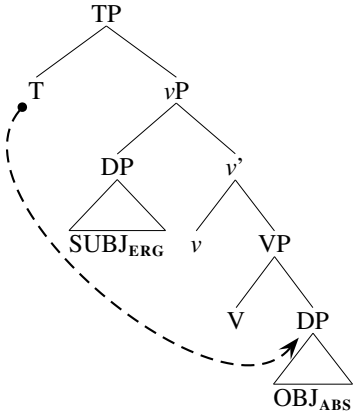
'We read the book.' (Sigurdsson 1996)

b. Morgum studentum liki verkið.
agree
many student.PL.DAT like.3SG the.job.NOM

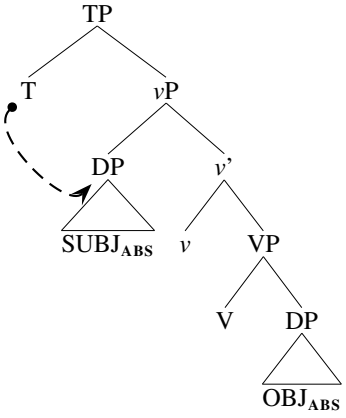
'Many students like the job.' (Harley 1995a)

The apparent "ergative" agreement pattern of Hindi-Urdu, then, can be reduced to regular nominative agreement originating in T^0, plus the restriction that morphologically marked (i.e. ergative, dative) subjects are unable to trigger agreement, just as morphologically marked dative subjects are unable to trigger agreement in Icelandic. The marked-subject ("ergative") construction is schematized in (14), and the unmarked subject is shown in (15). See Anand and Nevins 2006 for further discussion.

(14) ERGATIVE SUBJECT



(15) ABSOLUTIVE SUBJECT



Note that if all apparent ergative patterns of agreement are actually nominative-accusative agreement interrupted by morphologically marked ergative subjects, then it becomes easy to explain the gap in (10) above: ergative agreement is impossible with nominative-accusative case marking because the appearance of an ergative agreement pattern is epiphenomenal, arising only when ergative case marking interrupts the nominative agreement from targeting a transitive sub-

ject. This raises the question of what happens in those language with ergative agreement systems but *no* morphological case marking on nominals, which we turn to below.

2.3 Woolford 2000

Focussing on the Q'anjob'alan language Popti' (also known as "Jakaltek"), Woolford (2000) maintains that despite the absence of ergative morphological case, there is no need to posit an abstract system of ergative agreement. As in Hindi-Urdu, the ergative-absolutive agreement system is not a discrete phenomenon, but according to Woolford arises as a side effect. Recall that in Hindi-Urdu, only absolutive arguments trigger agreement in the ergative-patterning portion of the grammar, and that this agreement has been claimed to be nominative agreement from T^0 which skips the case-marked transitive subject. In Popti', and the rest of Mayan, however, we find morphology for both ergative and absolutive. To account for this, Woolford proposes that the *ergative* agreement is regular nominative agreement from T^0, and that something special happens in *intransitives*.

Woolford capitalizes on the idea that in a transitive construction like the one in (16a), subject agreement (ergative) is marked by agreement, while object agreement (absolutive) is marked by clitics; evidence for the clitic/agreement divide is presented below, but see also Woolford 2000. In this respect, Woolford notes, Popti' transitives are quite similar to Spanish transitives like (17a): verbal agreement is controlled by the subject, while clitics cross-reference objects (2nd person *te* in (17a)).

(16) POPTI'

a. Ch-**ach** w-il-a'.
TAM-2ABS 1ERG-see-TV
'I see you.'

b. Ch-**ach** toy-i.
TAM-2ABS go-ITV
'You go.' (Craig 1977)

(17) SPANISH

a. **Te** veo.
2OBJ see.1SUBJ
'I see you.'

b. Vas.
go.2SUBJ
'You go.'

The difference, of course, lies in the intransitives in (16b) and (17b): Popti' uses the transitive

object marker to mark intransitive subjects (absolutive), while Spanish uses the subject agreement pattern (nominative). Woolford employs an Optimality Theoretic account (Prince and Smolensky 1993) to explain this difference; ϕ-marking, she proposes, is costly from a computational perspective. Nonetheless, many languages must use it to mark grammatical relations. These tensions result in the constraints in (18), and different rankings achieve the fact that some languages prefer to use clitics (Popti': REALIZE-$\phi \gg$ *CL $\gg$ *AGR), while others prefer to use agreement (Spanish: REALIZE-$\phi \gg$ *AGR $\gg$ *CL).

(18)

*CL	Avoid clitics
*AGR	Avoid agreement
REALIZE-ϕ	Morphologically realize ϕ-features (person, number, etc.) that occur on a head in an agreement relationship with an argument.

Under this account, there is nothing deeply *ergative* about Popti', or by extension, other Mayan languages with similar person marking patterns. In both Hindi-Urdu and Popti', the appearance of an "ergative" agreement system reflects: (i) *nominative* agreement, assigned through a probe-goal relationship with T^0; and (ii) a lack of agreement with a subset of nominal arguments (intransitive subjects in Popti', ergative-case-marked transitive subjects in Hindi-Urdu). In Hindi-Urdu, this nominative agreement thus tracks absolutive arguments, while in Mayan, it tracks ergative arguments.

Under this type of account, there is an important difference between Hindi-Urdu and Popti': in Hindi-Urdu, transitive subjects (at least in certain aspects) *do* receive abstract ergative case, which triggers the morphological case marking on the transitive subject; this case marking blocks agreement from T^0, resulting in nominative (= absolutive) agreement on the unmarked object. While the agreement is simply nominative agreement, abstract case assignment (nominal licensing) still follows an ergative pattern. In Popti', however, there is no abstract system of ergative case assignment at all. The ergative agreement appearing on transitive subjects is simply *nominative*

agreement; it is absent in intransitives due to a general preference in the language for using clitics. Not only is a nominative analysis of ergative case assignment incompatible with the Chol data below, but it is also unclear how such an analysis would be compatible with the syntactically ergative behavior of languages like Popti' with respect to extraction asymmetries between ergative and absolutive arguments (see e.g. Craig 1979).

Below I argue that abstract ergative case assignment is present in Mayan, and that Set A agreement is not nominative agreement from T^0, but rather represents true *ergative* agreement. That is, Set A agreement is the result of an *Agree* relationship between transitive v^0 and the transitive subject. I assume that this agreement relationship goes hand-in-hand with nominal licensing, which occurs in the same structural configuration. I provide evidence that this agreement must be realized *inside* the *v*P phase, before higher functional projections are introduced. Like Woolford, I follow work by Johns (2000) and others who have argued that the appearance of ergativity is not a uniform phenomenon, and that not all ergative languages pattern alike. For example, there are indeed clear differences between Hindi-Urdu and Mayan patterns of agreement. I nonetheless maintain that Chol nominal licensing *is* underlyingly ergative insofar as transitive subjects receive special licensing internal to *v*P.[5] Before delving into these arguments, we first turn to an overview of the person markers in Mayan.

3. Set A and Set B

As foreshadowed in section 2.1 above, I argue that Set B/absolutive markers are the result of clitic doubling of nominal arguments (which may be *pro*), while Set A/ergative markers are the result of a local relation of *Agree* between the transitive subject and transitive v^0. The status of absolutive markers as clitics is relatively well accepted within Mayan; see Grinevald and Peake 2012 for an overview; Mateo-Toledo 2008 and Coon et al. to appear on Q'anjob'al; Woolford 2000 on Popti'; Coon 2013 on Chol; and Preminger 2014 on Kaqchikel (cf. Shklovsky 2012 for more nuanced discussion). See also Kaufman 1990 and Robertson 1992 for further historical evidence.

[5] While further work is needed to determine whether independent evidence exists in other Mayan languages, surface similarities between Set A and Set B morphemes suggest that a common analysis is possible.

Below, the argument will focus on the nature of the ergative morphemes, with absolutives provided largely for contrast. In this section I briefly review the form and location of each series of morphemes, before turning to phonological and syntactic evidence for the analysis outlined above. While the majority of data below come from Chol (Tseltalan branch), I also compare Chuj (Q'anjob'alan), and Kaqchikel (K'ichean), in order to provide a sense of the commonalities and differences across the family.

3.1 Set A

Across the Mayan family, the Set A series of morphemes appears prefixed to the verb stem (as ergative) or nominal stem (as possessor); see Larsen and Norman 1979.

(19) a. TAM – **SET A** – VERB.STEM

b. **SET A** – NOUN.STEM

Set A markers have pre-vocalic and pre-consonantal allomorphs. As the Kaqchikel (20), Chuj (21), and Chol (22) forms show, these allomorphs are not entirely phonologically predictable, but do consistently prevent hiatus.

(20) KAQCHIKEL

	singular		plural	
	__C	__V	__C	__V
1	*in-*	*inw-*	*qa-*	*q-*
2	*a-*	*aw-*	*i-*	*iw-*
3	*r(u)-*	*r-*	*ki-*	*k-*

(21) CHUJ

	singular		plural	
	__C	__V	__C	__V
1	*hin-*	*w-*	*ko-*	*k-*
2	*ha-*	*h-*	*he-*	*hey-*
3	*s-*	*y-*	*s-*	*y-*

While Kaqchikel and Chuj have distinct singular and plural forms, in Chol the Set A markers indicate only person features. To indicate plurality, omnivorous plural morphemes—which may pluralize either ergative or absolutive arguments—appear in addition to the prefix.

(22) CHOL

	__C	__V
1	*k-*/*j-*	*k-*
2	*a-*	*aw-*
3	*i-*	*iy-*

These morphemes mark *all* transitive subjects, regardless of thematic role (e.g. agent, experiencer), as well as possessors and intransitive subjects in certain "split" constructions (possibly also possessors; see Coon 2013).

3.2 Set B

The Set B/absolutive morphemes have a variable position across the Mayan family, and sometimes even within a single language (Bricker 1977). In what Coon et al. to appear refer to as "High-Abs" languages, the Set B marker precedes the verb stem and Set A marking when present; in "Low-Abs" languages, the Set B morpheme attaches stem-finally.

(23) TAM – {**SET B**} – **SET A** – VERB.STEM – {**SET B**}

In Chol, absolutive markers are consistently low, while in Kaqchikel they are consistently high. Some High-Abs languages, such as Chuj, have variable positioning of absolutive morphemes: they appear high in clauses with TAM, as in (24a), but low in constructions which lack a preverbal TAM marker, as in (24b).

(24) CHUJ

a. Ix-**in**-y-il winh winak.
TAM-1ABS-3ERG-see CLF.MASC man
'The man saw me.'

b. Winak-**in**.
man-1ABS
'I'm a man.'

Across the Mayan family, the absolutive morphemes bear a clear resemblance to free-standing emphatic pronouns, as shown in the tables in (25)–(27).

(25) KAQCHIKEL

	SINGULAR		PLURAL	
	Set B	Pron.	Set B	Pron.
1	*-i(n)-*	*rïn*	*-oj-*	*röj*
2	*-a(t)-*	*rat*	*-ix-*	*rïx*
3	*Ø*	*rija'*	*-e(')-*	*rije'*

(26) CHUJ

SINGULAR		PLURAL	
Set B	Pron.	Set B	Pron.
-in	*hin*	*-onh*	*honh*
-ach	*hach*	*-ex*	*hex*
Ø	*Ø*	*-eb'*	*heb'*

(27) CHOL

	Set B	Pron.
1	*-oñ*	*joñoñ*
2	*-ety*	*jatyety*
3	*Ø*	*Ø*

To summarize the two series of morphemes, we have seen that the absolutive markers bear a formal resemblance to free-standing pronouns, while ergative morphemes do not. Absolutive morphemes also appear in a variable position within the Mayan verbal complex, while ergative morphemes are fixed as prefixes immediately preceding the stem. Both of these properties lend initial support to the idea that absolutives are closer to D^0-category pronouns—and thus more clitic-like—than ergatives. Finally, ergative morphemes have pre-vocalic and pre-consonantal allomorphs, a fact which will become relevant in the following section.

4. Morphophonological evidence

This section provides further evidence that absolutive morphemes have a more clitic-like behavior than the ergative prefixes, and, more importantly, that the realization of the ergative markers must be the result of a relationship that takes place *internal* to transitive *v*P. We first look at the behavior of ergative morphemes with respect to vowel-initial roots in section 4.1, and then turn to vowel

alternations in section 4.2. In section 4.3 I connect the phonological facts back to the syntactic proposal outlined above. Specifically, I propose that roots in Chol must be associated with a CVC template at the *v*P/*n*P phase, and that the initial C may be filled either with an epenthetic glottal stop, or with a C from the (phase internal) Set A morpheme, when present. This proposal is further motivated in section 4.4 with discussion of roots and templatic morphology in Chol. In the remainder of this section, forms in square brackets are in IPA.

4.1 Vowel-initial roots

Roots in Mayan languages are generally of the form CVC, but there also exists a class of what are known as "vowel-initial roots" (e.g. Vázquez Álvarez 2011 on Chol). Examples of Chol CVC and VC roots from different categories are given in (28).

(28)

CVC			VC		
lok'	[lok']	'exit'	*och*	[otʃ]	'enter'
waj	[wah]	'tortilla'	*uj*	[uh]	'moon'
k'el	[k'el]	'watch'	*il*	[il]	'see'
mich'	[mitʃ']	'angry'	*ach'*	[atʃ']	'wet'

In word-initial position, these roots are pronounced with an initial glottal stop, [ʔVC], illustrated by the imperative in (29a).[6] Vowel-initial roots also appear with an initial glottal stop when preceded by a pre-stem clitic like the feminine/agentive *x*= [ʃ=], shown in (29b).[7]

(29) a. [**ʔotʃ**-eŋ]! (*och-eñ!*)
enter-IMP
'Enter!'

b. [**ʃ=ʔak'**-wah] (*x='ak'-waj*)
CL=give-tortilla
'tortilla-giver'

[6]Initial glottal stops are not represented in most standard orthographies, but glottal stop is represented as an apostrophe, ', in other positions.

[7]This clitic is historically related to a feminine gender marker, and is still found on many nouns denoting humans, animals, and plants (Vázquez Álvarez 2011). It is frequently found on agentive nominals, though does not appear to be a nominalizer (i.e. n^0), per se, as forms like (29b) are also fine without *x*=, and in these contexts also does not appear to carry gender information, as the referent of (29b) could be male or female.

The same pattern is seen in vowel-initial noun roots like *ixik* 'woman', which is pronounced with a glottal stop (i) word-initially and (ii) when preceded by the feminine clitic, as shown in (30). It is important to point out that this is not a phonotactic constraint: the sequence [ʃ-V] is licit elsewhere in the language, as in *xux* [ʃuʃ] 'wasp' or *xityil* [ʃitʲil] 'standing on head'.

(30) [ʔiʃik], *[ʃ=iʃik], [**ʃ=ʔ**iʃik]
woman, CL=woman, CL=woman

'woman'

In contrast, when an ergative marker precedes a vowel-initial root, the glottal stop does not appear. Recall that ergative prefixes have pre-consonantal and pre-vocalic allomorphs. Compare the Chol 2nd person ergative forms in (31).[8]

(31) a. [**aw**-uskuɲ] (*aw-uskuñ*)
2ERG-older.brother

'your older brother'

b. [**a**-ʧiʧ] (*a-chich*)
2ERG-older.sister

'your older sister'

Rather than inserting a glottal stop, the pre-vocalic allomorph of the ergative morpheme is used with vowel-initial roots, as shown by the forms in (32). A glottal stop here is ungrammatical, even though these forms would satisfy Chol's phonotactic restriction against vowel hiatus. This in turn makes the pre-consonantal allomorph of the ergative marker a theoretical possibility, as shown in (32). However, only the pre-vocalic allomorph without a root-initial glottal stop is possible.

(32) a. Tyi [**aw-ɨk'**]-e-y-oñ. *[**a-ʔɨk'**]-e-y-oñ
PRFV 2ERG-give-TV-EP-1ABS

'You gave it to me.'

b. [ʔul], [**aw-ul**] *[**a-ʔ**ul]
atole 2ERG-atole

'atole', 'your atole'

[8]There is an all-purpose epenthetic glide in Chol, but it is *-y* [-j] (see e.g. (32a); the alternation between *a-* and *aw-* is limited to ergative forms and thus not simply a phonological process.

A similar alternation is found with Set A prefixes and a cognate of the agentive prefix in K'ichean languages like Kaqchikel. Compare *ik'* [ʔik'] 'month', *r-ik'* [rik'] 'her period', and *aj-'ik'* [axʔik'] 'domestic worker' (Barrett 2007, discussed in Bennett 2014). Bennett notes:

> The retention of epenthetic [ʔ] is extremely common for agentive prefixes in other Mayan languages as well (these are all cognate with Kaqchikel *aj*). This heterogenous behavior cannot be explained by positing an underlying glottal stop; some higher grammatical principle is clearly involved, such as prosodic conditioning or morphological cyclicity (Bennett 2014, 11).

Below I formalize the higher grammatical principle involved in terms of phase-level templatic requirements.

To summarize, the glottal stop is inserted at the beginning of a vowel-intial root at word edges and when clitic adjacent. The ergative marker blocks insertion of the glottal stop. Furthermore, the form of the ergative marker is sensitive to the initial vowel. We return to these facts after examining another alternation at the word edge, this time involving vowel quality.

4.2 Vowel alternations

While most Mayan languages have a 5-vowel system, Chol contains a sixth vowel, *ä* [ɨ]. This vowel is phonemic, yet in some cases alternates predictably with its low counterpart, [a]. For example, the vowel-initial root *Ak'* 'give' surfaces as [ɨk'] when word-internal, as when preceded by the ergative prefix in (33a), but as [ʔak'] when at a word edge in (33b), or when preceded by the clitic *x*= in (33c).

(33) a. Tyi **[k-ɨk']**-e-y-ety .
PRFV 1ERG-give-APPL-EP-2ABS
'I gave it to you.'

b. Tyi **[ʔak']**-eñ-ty-i-y-oñ k-chityam.
PRFV give-APPL-PASV-ITV-EP-1ABS 1ERG-pig
'My pig was given.' (Vázquez Álvarez 2002, 311)

c. [**ʃ=ʔak'**]-waj
CL=give-tortilla
'tortilla-giver'

This [a]/[ɨ] vowel alternation is also found at the end of the word, for example in the "status suffix" for derived transitives, *-Añ*. This suffix appears as [-ɨɲ] when preceding inflectional morphology, like the passive in (34a), but as [-aɲ] word-finally (34b), and when followed by an enclitic, like the second position clitic *=ix* [=iʃ] in (34c).

(34) a. Tyi [wɨj-is-**ɨɲ**-tʲ-i]. (*wäy-is-äñ-ty-i*)
PRFV sleep-CAUS-SUF-PASV-ITV
'He was made to sleep.'

b. Mi [k-wɨj-is-**aɲ**] ñeñe'. (*wäy-is-añ*)
IMPF 1ERG-sleep-CAUS-SUF baby
'I made the baby sleep.'

c. [wɨj-is-**aɲ**=iʃ]! (*wäy-is-añ-ix*)
sleep-CAUS-SUF=already
'Make him sleep already!'

Notably, a stem-final absolutive results in the suffix *-añ* [-aɲ]—just like at word edges and with second position clitics, as shown in (35a). The *-äñ* [-ɨɲ] variant of the suffix is impossible, as in (35b).

(35) a. Mi [k-wɨj-is-**aɲ=etʲ**]. (*k-wäy-is-añ-ety*)
IMPF 1ERG-sleep-CAUS-SUF=2ABS
'I made you sleep.'

b. * Mi [k-wɨj-is-**ɨɲ**-etʲ]. (**k-wäy-is-äñ-ety*)
IMPF 1ERG-sleep-CAUS-SUF-2ABS

The table in (36) summarizes the facts presented so far in this section. Absolutive markers pattern with clitics and word edges in conditioning the vowel [a]; since absolutives never precede

the root, the appearance of a glottal stop cannot be tested. Ergatives, in contrast, pattern with word-internal inflectional morphology. Notably, the ergative morphemes are the *only* clear instances of inflectional prefixes in the language, so they cannot be compared with other word-internal morphemes.

(36)

adjacent to...	[-VC] vs. [ʔVC]	[ɨ] vs. [a]
word boundary	[ʔVC]	[a]
clitic	[ʔVC]	[a]
absolutive	—	[a]
inflectional suffixes	—	[ɨ]
ergative	[-VC]	[ɨ]

As noted above, the fact that Set B/absolutive markers behave as clitics in terms of level of attachment, combined with their formal similarity to pronouns, suggests that they have a closer link to pronominals. While this is consistent with the proposal in (7) above, recent work has demonstrated that there is not a one-to-one mapping between *phonological* clitichood and *syntactic* clitichood (e.g. Kramer 2014, Nevins 2011).[9] Setting aside the status of the absolutive markers, I show in the following section that in order to capture the phonological pattern with the Set A ergative markers, we need an agreement relationship which takes place *internally* to *v*P/*n*P. No higher functional material is involved.

4.3 Phase-internal agreement

Recall from section 4.1, summarized in (36), that vowel-initial roots appear with an initial glottal stop word-initially and when preceded by the clitic [ʃ=], but this glottal stop is not present when the root is preceded by a Set A ergative morpheme. Furthermore, the ergative morphemes have special allomorph forms for use with vowel-initial roots. The very existence of this type of allomorphy suggests that an underlying difference between vowel-initial [VC] and other [CVC] roots. That

[9] See also Bennett and Henderson 2014 on Kaqchikel Set B markers, which behave as phonological clitics or affixes, depending on the environment in which they appear.

initial glottal stop is epenthetic for vowel-initial roots is further supported by the observation that in some Mayan languages, there is a contrast between roots with an invariant or "firm" initial glottal stop, and roots which display the alternations discussed above; see Bennett 2014 for citations and discussion. Additional evidence, and an analysis, is provided in section 4.4.1 below.[10]

I propose that roots in Chol must be associated with a CVC melodic template (McCarthy 1979, 1981, discussed below), and that this association takes place at the *v*P/*n*P phase. Crucially, ergative agreement takes place internally to this phase, shown in (37).[11] Here the vowel-initial root *Ak'* 'give' raises to v^0 where it combines with the transitive suffix *-ä* [-ɨ]. The 2nd person subject is merged in Spec,VoiceP. The complex v^0 head enters into an *Agree* relationship with the subject, and the prevocalic allomorph of the ergative prefix appears on the stem.[12]

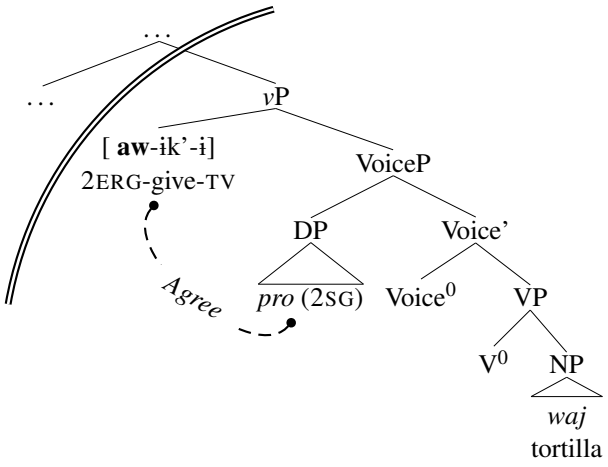
(37) a. Tyi [aw-ɨk'-ɨ] waj. (*aw-äk'-ä*)
PRFV 2ERG-give-TV tortilla
'You gave tortillas.'

[10]Many thanks to Judith Aissen, Ryan Bennett, Lauren Clemens, Gillian Gallagher, Glyne Piggott, and Michael Wagner for discussion of this question.

[11]Note that it is crucial that our constraint make direct reference to the root, since the ergative prefixes do not themselves appear with onsets (*[ʔaw-ɨk'-ɨ]). This is discussed for similar facts in Tz'utujil by Flack (2009), who proposes that ergative prefixes (which she calls clitics) attach *outside* the prosodic word (PWd) in Tz'utujil. While her analysis captures the alternation between word-initial roots and ergative morphemes, she does not discuss clitics like Chol's *x*= [ʃ=] which, for her, should attach outside the PWd but nonetheless bleed glottal insertion.

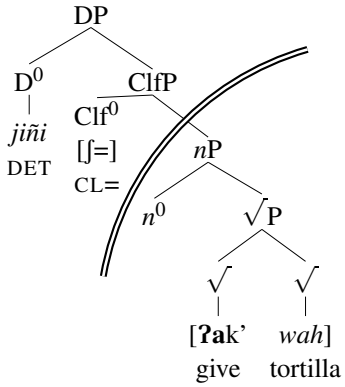
[12]The specific representations here rely on specifiers being spelled out together with their phase heads, though we could just as easily posit a phase head above the subject/possessor. For example, Coon et al. (to appear) place transitive subjects in Spec,VoiceP; VoiceP sits below a phasal head containing the status suffix. As the specifics are not relevant to the discussion here, I simplify to *v*P; what is critical is simply that the agreement does not involve a higher functional head like T^0 or Infl^0.

b.



The picture in (37) contrasts with the appearance of the same root in an example like (33c), shown in (38). Here, there is no external argument, and no possessor. The *n*P phase is sent to spell-out, and a glottal stop must be inserted in order to satisfy the requirement that the underlyingly /CV/ root associate with a CVC template. The feminine gender prefix *x*= [ʃ=] attaches higher than n^0, in a nominal projection here labelled simply 'ClfP' for ClassifierP. Crucially, *x*= is not a nominalizer; agentive nominals can be formed without this clitic and its appearance on these compound forms is optional. Nouns preceded by [ʃ=] can be preceded by the determiner *jiñi*, which I take as evidence that [ʃ=] attaches inside DP.

(38)



The proposal that Chol roots are subject to a requirement that they have an onset, and that

this requirement is evaluated low, at the *v*P/*n*P phase, accounts for the facts above and also finds cross-linguistic support from other phonological requirements argued to hold at the first phase (see Newell 2008 and references cited there). If ergative agreement were actually nominative agreement, we would lose the ability to capture the different behavior of the ergative prefixes and the noun class clitic in terms of syntactic structure: both would take place externally to the *v*P phase. While we could conceivably specify in the lexicon that the *x*= [ʃ=] clitic attaches later than other morphology, I propose this is unnecessary. In the section that follows, we turn to syntactic evidence which supports the same conclusion, but first we review independent support for the root onset requirement.

4.4 Templates and root reduplication

In this section spell out the requirement that roots in Chol must associate with a CVC template, along the lines of McCarthy 1979, 1981 *et seq*. for triliteral roots in Arabic, and building on work on Yucatecan languages by Lois (2011). I begin in section 4.4.1 with an overview of root-and-pattern morphology in Semitic and Mayan, and then in section 4.4.2 I show evidence from reduplication that provides further support for the proposal that the ergative prefix is inserted before the *v*P/*n*P phase.[13]

4.4.1 *Templatic morphology*

Arabic verbal roots typically consist of three consonants, which appear in different patterns or *binyanim*, as shown for the root *ktb* 'write' in (39).

[13] I am grateful to Judith Aissen for suggesting reduplication as a diagnostic.

(39) ROOT $\sqrt{}$KTB (McCarthy 1981, 384)

katab	'write'
kattab	'cause to write'
kaatab	'correspond'
ʔaktab	'cause to write'
takaatab	'write to each other'
nkatab	'subscribe'
ktatab	'write, be registered'
staktab	'write, make write'

Building on the principles of autosegmental phonology (Goldsmith 1976), McCarthy (1981) proposes that Arabic verbs should be represented as in (40): the root itself consists of an unpronounceable sequence of consonants, while inflectional information is encoded on a separate tier, here a vowel. The root and inflectional morphology are then associated with a CV-skeleton, or *binyan*.

(40)

root morpheme	k t b	
template	CVVCVC	*kaatab* 'correspond'
inflectional morpheme	a	

That Mayan CVC roots are *mini* versions of Semitic trilateral root-and-pattern morphology has already been proposed for transitive verb roots in Yucatecan languages by Lois (2011). Here, however, there are only two consonants. The quality of the root vowel is also fixed (represented with a capital letter below), and voice alternations of transitive roots involve altering *suprasegmental features* of the root vowel, such as length, tone, and glottalization. The paradigm for the Yucatec root *jUch'* 'grind' is shown in (41).

(41) $\sqrt{}$*jUch'* – 'GRIND' (Lois 2011, 5)

CVC	active transitive	*juch'*
CV'VC	passive	*ju'uch'*
CV́VC	middle	*júuch'*
CV̀VC	antipassive	*jùuch'*

While the smaller root form in Yucatec offers fewer possibilities than Arabic, Lois demonstrates that this pattern is quite consistent across transitive roots, writing:

> My proposal for Mayan is that, as in Semitic languages, vowel-alternation roots in Yucatecan languages (the traditional transitive roots) are not pronounceable on their own; only when combined with pattern morphology that provides the vowel melody do they become pronounceable strings (Lois 2011, 6).

Chol's possibilities are even less robust, but one vowel alternation in transitive roots is completely productive. Active CVC transitive roots form unaccusative (passive) stems by lengthening and aspirating the root vowel, represented with an orthographic *j* (the orthography is Spanish-based), as shown by the forms in (42).[14,15]

(42) CHOL ACTIVE/PASSIVE ALTERNATION

ACTIVE			PASSIVE		
mek'	[mek']	'hug'	*mejk'*	[me^{h}k']	'be hugged'
juch'	[huʧ']	'grind'	*jujch'*	[hu^{h}ʧ']	'be ground'
mäñ	[mɨɲ]	'buy'	*mäjñ*	[mɨ^{h}ɲ̥]	'be bought'
ch'il	[ʧ'il]	'fry'	*ch'ijl*	[ʧ'i^{h}l̥]	'be fried'
wuts'	[wuʦ']	'wash'	*wujts'*	[wu^{h}ʦ']	'be washed'
kuch	[kuʧ]	'carry'	*kujch*	[ku^{h}ʧ]	'be carried'

[14]CVC roots ending in a final fricative form unaccusative stems through suffixation; see Vázquez Álvarez 2011. Some previous authors have described the CVC→CVjC alternation as involving *infixation* of [h] (e.g. Vázquez Álvarez 2011). I follow Attinasi 1973 in considering this to be a change in vowel quality, thereby maintaining the general CVC pattern of roots, and connecting this alternation to similar processes in Yucatecan.

[15]Note that under this analysis, neither active nor passive voice is more basic; rather, both are derived from underspecified roots. This finds support from the fact that many of Chol's unaccusative roots are CVjC in shape, though they contain no CVC transitive counterpart, e.g. *majl* [ma^{h}l̥] 'go', and *yajl* [ja^{h}l̥] 'fall'.

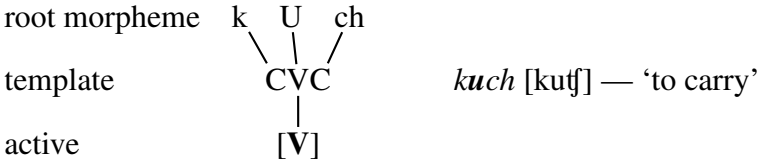
An example is shown in (43).

(43) a. Tyi i-**kuch**-u-y-oñ.
PRFV 3ERG-carry-TV-EP-1ABS
'She carried me.'

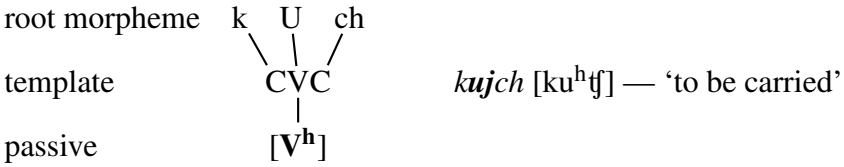
b. Tyi **kujch**-i-y-oñ.
PRFV carry.PASV-ITV-EP-1ABS
'I was carried.'

Following Lois' analysis of Yucatecan, we can represent the stem forms in (43a–b) as in (44) and (45), respectively. The root *kUch* contains two fully specified consonants, and one vowel underspecified for vowel quality. These roots are associated with the inflectional tier which fixes the vowel.

(44) ACTIVE

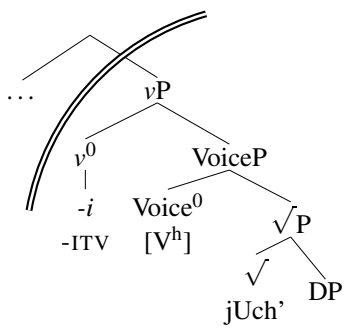


(45) PASSIVE



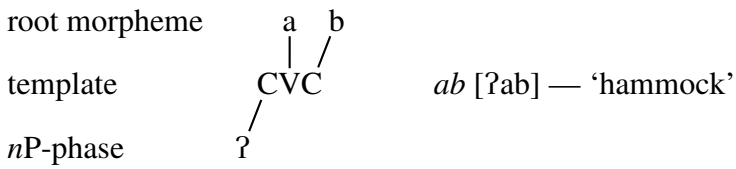
Following Arad 2003 on Hebrew and Lois 2011 on Yucatecan, I assume that the inflectional corresponds to VoiceP, as shown in (46) for the passive form in (43b)/(45).

(46)



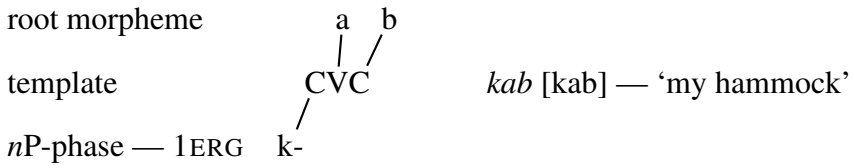
With this background in place, we now return to the connection to vowel-initial roots, the CVC requirement, and the location of the ergative morpheme. In particular I argue, following work cited above and discussed in detail in Bennett 2014, that these roots are underlyingly vowel initial—/VC/—and that the glottal stop is epenthetic, inserted to satisfy the CVC templatic requirement. Following the general templatic proposal, I assume that if a vowel initial root like /ab/ 'hammock' gets to the *n*P/*v*P phase and there is no consonant internal to the phase, then [ʔ] is inserted to fill the initial C slot of the CV-skeleton. (For simplicity, I represent this graphically as the glottal stop being inserted at the *n*P phase at the bottom of (47), though note that it is not associated with any particular morpheme.) Recall that vowel alternations are only productive for transitive verbs, and I thus represent a fixed root vowel here.

(47) VOWEL-INITIAL ROOT



If consonantal material is present internal to the phase—i.e. because of an ergative/possessive morpheme—this fills the C slot of the template and no glottal insertion occurs, as shown in (48).

(48) POSSESSED VOWEL-INITIAL ROOT



4.4.2 *Vowel initial roots and reduplication*

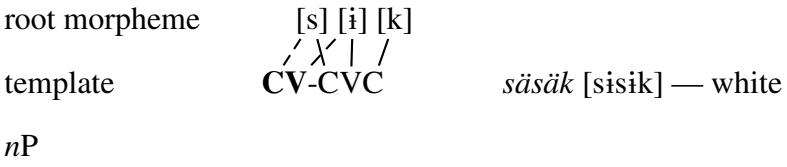
Evidence from reduplication supports an analysis in which the glottal stop is epenthetic, and not present in the underlying representation. In a limited number of environments—like colour terms—roots in Chol reduplicate. Chol's five basic colour terms are shown in (49). While these show several different reduplication patterns, of relevance here is partial reduplication of the vowel-initial root *ik'*, which results in the form *i'ik'* [ʔiʔik'].

(49) CHOL COLOUR TERMS

k'äñ	[k'ɨɲ]	'ripe'	*k'äñk'äñ*	[k'ɨɲk'ɨɲ]	'yellow'
yäx	[jɨʃ]	'clean, clear (of water)'	*yäjyäx*	[jɨhjɨʃ]	'green/blue'
chäk	[ʧɨk]	'clear (of soil)'	*chächäk*	[ʧɨʧɨk]	'red'
säk	[sɨk]	'clean'	*säsäk*	[sɨsɨk]	'white'
ik'	**[ʔik']**	'air, wind'	*i'ik'*	**[ʔiʔik']**	'black'

Marantz (1982) proposes that in reduplication, what is reduplicated is McCarthy's CV skeletal tier—the binyam, represented for the root *säk* to form *säsäk* shown in (50). Consonants and vowels from the root are copied to fill the C and V slots of the reduplicant.

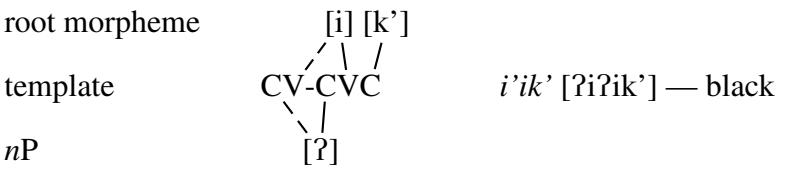
(50)



säsäk [sɨsɨk] — white

Reduplication of the vowel-initial root is shown in (51). As in (50) above, the skeleton now includes additional CV- slots. Here, however, the epenthetic glottal stop is inserted to fill both the C slot of both the root and reduplicant.

(51)



i'ik' [ʔiʔik'] — black

Of course, while I have represented the glottal stop as epenthetic insertion at the *n*P level, these forms are still consistent with the possibility that the glottal stop is underlyingly present in the root. The forms in (53), however, provide evidence for glottal stop insertion. As discussed in detail in Martínez Cruz 2007, colour terms belong to the handful of adjectives that may appear in attributive function between determiners and nouns, as shown in (52a).[16] Also in a limited number

[16]Many other modifiers are possible, but require the relative clause marker *-bä*, and then may appear either pre- or post-nominally. For example, (i) is an alternate way to express (52b). More work is needed on these forms, but see extensive discussion in Martínez Cruz 2007.

(i) Baki añ a-muty säsäk-bä.
where LOC 2ERG-chicken white-REL
'Where's your white chicken?'

of contexts, a possessive prefix may attach to the [Adj–N] form, as in (52b).[17]

(52) a. Baki añ jiñi **säsäk** muty?
where LOC DET white chicken
'Where's the white chicken?'

b. Baki añ **a**-säsäk muty?
where LOC 2ERG-white chicken
'Where's your white chicken?'

In (53), the same construction is shown but now with the reduplicated vowel-initial form *i'ik'* [ʔiʔik']. Strikingly, the glides from the 2nd and 3rd person possessive morphemes fill the C slot of the roots (I return to the 1st person possessive below).

(53) a. Baki añ [**aw**-i**w**ik' mut^{j}]? *(awiwik' muty)*
where LOC 2ERG-black chicken
'Where is your black chicken?'

b. Baki añ [**j**-i**j**ik' mut^{j}]? *(yiyik' muty)*
where LOC 3ERG-black chicken
'Where's his black chicken?

Forms like (53) are represented as in (54), where the consonant from the ergative marker fills the empty C slots in both the root and the reduplicant. Since consonantal material is present internal to the *n*P phase, glottal stop is not inserted.

(54)

root morpheme	[i] [k']	
template	CV-CVC	*yiyik'* [jijik'] — 3ERG-black
*v*P — 3ERG	[j]	

Note that if the glottal stop were part of the underlying representation of the root—and the deletion of the initial glottal were simply a phonotactic effect—we would expect the forms *[yiʔik'] and *[awiʔik'], though speakers judge these to be unequivocally bad.

[17] I assume the [Adj–N] form forms a root–root compound, and that the Set A possessive marker attaches to this complex head, as illustrated in (6) above.

One might wonder whether this could instead be analyzed as *spreading* of the glide, i.e. an underlying glottal stop is replace by a glide: /aw-iʔik'/→[aw-iwik']. Forms like *aw-e'tyel* [aweʔtʲel] in (55), however, provide evidence that this cannot be a regular phonological process. Both *i'ik'* [ʔiʔik'] 'black' and *e'tyel* [ʔeʔtʲel] 'work' have an initial and internal glottal stop. However, while *i'ik'* is the result of reduplication, *e'tyel* is not, and its internal glottal stop—under this analysis, not epenthetic—is not replaced by the glide of the ergative prefix.

(55)

	i'ik'	[ʔiʔik']	'black'	*e'tyel*	[ʔeʔtʲel]	'work'
	aw-iwik'	**[awiwik']**	'your black…'	**awewtyel*	—	—
	**aw-i'ik'*	—	—	*aw-eʔtyel*	**[aw-eʔtʲel]**	'your work'

Finally, note that the 1st person prefix, *k-*, does not show the same pattern that we saw in (53) above; as shown in (56), the glottal stop appears in the stem form. This is also the only form of the three that does not contain a glide (see (22) above). I suggest that *y* [j] and *w* [w], being relatively less specified than [k] (see de Lacy 2002; de Lacy and Kingston 2013), are better able to spread to fill both C slots, though more work is needed to formalize this difference.[18]

(56) Baki añ [**k**-i**ʔ**ik' mutʲ]?
where LOC 1ERG-black chicken
'Where's my black chicken?

[18] Ideally, we would like to see more forms to confirm that this is a general pattern. However, while reduplication occurs in other environments in Chol (for example, in adverbial predicates known as "affectives"), these forms may not appear prefixed with a Set A marker. To this point, *i'ik'* is the only vowel-initial reduplicated form I have been able to find to which a Set A marker may be prefixed. Another vowel-initial reduplicated adjectival form is *u'uts'* 'more or less good' (from *uts'* 'good'). While Vázquez Álvarez (p.c.) does not find this form grammatical in a possessed construction, he notes that if someone *were* able to produce these, his intuition is that they would pattern the same as *i'ik'*. These pseudo-nonce forms are summarized in (i), where the glides appear in the prefix and the root, while the velar [k] does not.

(i) PSEUDO-NONCE FORMS

1st person	*k-* + *u'uts'*	*ku'uts'*
2nd person	*aw-* + *u'uts'*	*awuwuts'*
3rd person	*y-* + *u'uts'*	*yuyuts'*

I am grateful to Ryan Bennett, Lauren Clemens, and Gillian Gallagher for discussion of these patterns.

4.5 Summary

To summarize, this section provided phonological and morphophonological evidence that the Set A ergative/possessive morphemes attach internally to the *v*P/*n*P phase. While Set B absolutive markers behave as phonological clitics, attaching outside the word, Set A markers contrast with pro-clitics in attaching word-internally.[19] Evidence for this came from the fact—noted across Mayan—that Set A markers block insertion of a glottal stop in vowel-initial roots. I argued that these facts could be accounted for by positing a requirement that (**i**) roots in Chol must associate with a CVC template (**ii**) this association takes place below the *v*P/*n*P phase. When no consonantal material is present internal to the phase, an epenthetic [ʔ] is inserted; when a Set A marker is present, its consonant fills the initial C slot. This proposal is consistent with work on Semitic and Yucatecan languages, which suggests that the inflectional melody is inserted at the phase (Arad 2003; Lois 2011). The appearance of Set A glides internally to reduplicated forms lends further support to the claim that these morphemes are inserted low in the structure, and specifically, that the glottal stop which appears in vowel-initial roots must not be underlying. That is, Chol roots may be either /CVC/ or /VC/.

5. Syntactic evidence

In this section we turn to evidence from embedded clauses for the low placement of Set A markers. Vázquez Álvarez (2013) describes three types of embedded clauses in Chol, summarized in (57). Fully finite clauses appear with both TAM and ϕ-marking. What Vázquez Álvarez (2013) terms "less finite clauses" lack TAM marking, but obligatorily show ϕ-agreement; "non-finite" embedded clauses lack both. Note that preverbal TAM markers have been associated with finite Infl^0 in other work on Mayan languages (e.g. Aissen 1992), a proposal which I adopt here.

[19] Citing difficulties in distinguishing clitics from agreement (see e.g. Kramer 2014), an anonymous reviewer asks whether anything would rule out an analysis where Set A markers are low, *v*P/*n*P-internal clitics. For Chol, the contrasts in behavior between Set A and Set B markers noted in sections 4.1–4.2 above would be difficult to account for, since in a transitive clause v^0 is proposed to be responsible for both Set A agreement and Set B clitic-doubling (see §2.1), though in principle nothing rules out this possibility and the main claim of this paper—that higher functional heads are not involved in Set A agreement—would still be maintained.

(57)

	TAM	Person/Number	Analysis
Fully finite	✔	✔	
"Less finite"	✘	✔	= non-finite transitive
Non finite	✘	✘	= non-finite intransitive

I propose that all TAM-less forms are non-finite; the class "less finite" clauses all correspond to transitives, while the "non-finite" clauses are all intransitive. Below I review these arguments and demonstrate how this supports the proposal that ergative agreement happens low in the structure. I propose that while Vázquez Álvarez' descriptive typology is useful, there is no need for a *gradient* notion of finiteness; rather, because ergative agreement happens low in the clause, we predict it should be available regardless of the presence or absence of finite Infl^0.

We first examine different types of embedded clauses in Chol in section 5.1. In section 5.2 I propose that the Set A marking on the "less-finite" transitives is an example of low ergative agreement between transitive v^0 and the embedded PRO subject. In section 5.3 I provide evidence that this is truly ergative agreement, and not possessive agreement (in contrast to other types of embedded forms, such as progressives). Finally, I examine differences between unergatives and unaccusatives in section 5.4.

5.1 Finiteness

Examples of fully finite transitive and intransitive embedded clauses are shown in (58). These are introduced by the complementizer *che'* and carry their own TAM and ϕ-marking, which is independent from that of the matrix clause; the matrix verb *-om* 'want' belongs to the class of stative predicates in Chol and thus does not appear with TAM marking (see Vázquez Álvarez 2011, Coon 2013).

(58) a. K-om [$_{CP}$ che' **mi** **a**-wuts' jiñi pisil].
1ERG-want that IMPF 2ERG-wash the clothes
'I want that you wash the clothes.'

b. Tyi y-äl-ä [$_{CP}$ che' **tyi** yajl-i-y-**ety**.].
PRFV 3ERG-say-TV that PRFV fall-ITV-EP-2ABS
'She said that you fell.'

Examples of clearly non-finite embedded clauses are shown in (59). Both TAM and ϕ-marking are impossible here, and there is an obligatory control relation between the matrix and embedded subjects. The intransitive in (59a) appears with a nominalizing suffix *-el*. I follow previous work which takes all non-finite embedded clauses in Chol to be nominal(ized) complements to the matrix verb (Coon 2010a, Coon 2013).

(59) a. **K**-om [$_{NP}$ wäy-el].
1ERG-want sleep-NML
'I want to sleep.'

b. **K**-om [$_{NP}$ jap kajpe'].
1ERG-want drink coffee
'I want to drink coffee.'

Though the embedded form in (59b) appears to be transitive, this is misleading. In forms like (59b), known as "incorporation antipassives" (see e.g. Dayley 1981), the internal argument must be bare and non-referential. As with the intransitive stem in (59a), incorporation antipassives like *jap kajpe'* pass distributional tests for nominals (Coon 2010a). Pronouns and determiners are impossible in object position, as shown by the ungrammaticality of (60a), suggesting that the bare NP object undergoes noun incorporation or "pseudo noun incorporation" into the verb stem (see e.g. Massam 2001). I assume that transitive *v*P is not projected in this structure. This is consistent with the proposal that transitive objects in Chol receive structural accusative case from transitive v^0 (cf. Legate's ABS=DEF discussed in section 2.1 above and Coon et al. to appear); because the object is licensed via incorporation (see e.g. Baker 1988), transitive v^0 is not needed.

Instead, in order to embed a fully transitive clause, ergative marking must appear on the embedded subject, as in (60b).

(60) a. * K-om [jap **jiñi** kajpe'].
1ERG-want drink DET coffee
intended: 'I want to drink the coffee.'

b. ✔ K-om [$_{NP}$ **k**-jap **jiñi** kajpe'].
1ERG-want 1ERG-drink DET coffee
'I want to drink the coffee.'

Unlike the finite clauses in (58) above, the "less-finite" embedded transitive in (60b) may not appear with a complementizer, shown by the form in (61a). While person marking appears on both matrix and embedded verb stems, these markers *must* be co-referential, as shown by the ungrammaticality of (61b). For disjoint reference of matrix and embedded subjects, a fully finite form—with a complementizer and aspect—must be used, as in (61c).[20]

(61) a. **K**-om [$_{NP}$ (*che') **k**-mek'-ety].
1ERG-want that 1ERG-hug-2ABS
'I want to hug you.'

b. * **K**-om [**i**-mek'-ety].
1ERG-want 3ERG-hug-2ABS
intended: 'I want her to hug you.'

c. **K**-om [$_{CP}$ **che' mi** **i**-mek'-ety].
1ERG-want that IMPF 3ERG-hug-2ABS
'I want that she hugs you.'

To summarize the facts so far, we have seen that both transitive and intransitive can appear in fully finite embedded clauses. However, in TAMless embedded clauses—Vázquez Álvarez' "non-finite" and "less-finite" categories—transitive and intransitive predicates diverge, as shown in (62). Intransitives may not appear with ergative subject marking, while transitives must.

(62) a. **Aw**-om [$_{NP}$ (*a-)ts'äm-el].
2ERG-want 2ERG-bathe-NML
'You want to bathe.'

[20]While coreferential subjects are not impossible in fully finite forms with complementizers, speakers report that these sound awkward, probably not unlike their English equivalents.

b. **Aw**-om [$_{NP}$ *(**a**-)juch' jiñi ixim].
2ERG-want 2ERG-grind DET corn
'You want to grind the corn.'

Independent evidence suggests that these TAMless embedded transitives are nominalized above the *v*P layer (Coon 2010a, Coon 2013). In particular, transitive objects in Chol are licensed by transitive v^0, and are thus correctly predicted to remain available in non-finite environments. Voice alternations such as passives, applicatives, and causatives are each possible in these complement clauses, suggesting that some verbal projections must be present. I propose that the behavior of these TAMless embedded clauses falls out automatically from the analysis of ergative marking proposed above: ergative agreement appears whenever transitive *v*P is projected, regardless of the presence of a finite Infl^0 higher in the clause.

5.2 Embedded ergative

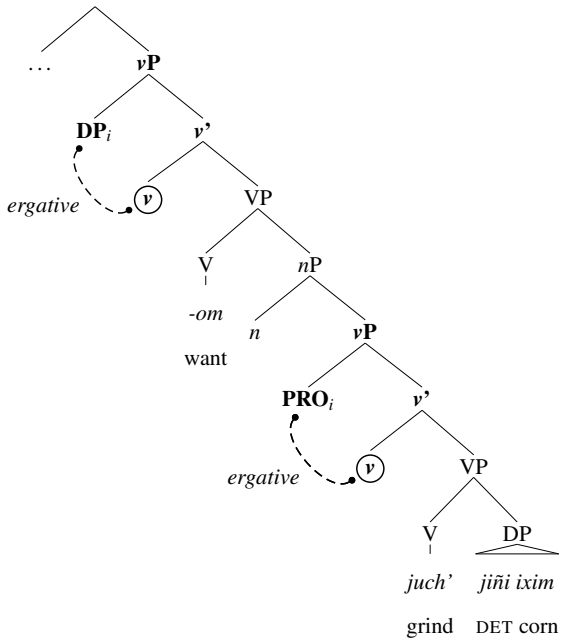
Nominal licensing and ϕ-agreement are only expected to correlate with finiteness when Infl^0 is the functional head responsible for licensing a particular nominal. Nominative case on subjects—assigned by T^0/Infl^0—is lost in non-finite environments in nominative-accusative languages like English. In ergative-absolutive languages in which absolutive arguments have been argued to receive structural case form Infl^0, it is exactly these absolutives which disappear in nonfinite environments (see Legate 2008, and Coon et al. to appear for Mayan). If, however, transitive v^0 is responsible for ergative agreement, we do not necessarily predict ergative (Set A) to be unavailable in non-finite environments.

I argue that the TAMless embedded transitives are nominalized above transitive *v*P, and that this nominalized stem serves as the complement of the transitive matrix verb *-om* 'want'. The structure of the transitive (62b) above is shown in (63). The embedded subject is controlled PRO, explaining the coreference requirement between matrix and embedded subjects. Both the overt subject (here a 2nd person *pro*), and the null embedded subject, trigger ergative agreement on the verb.

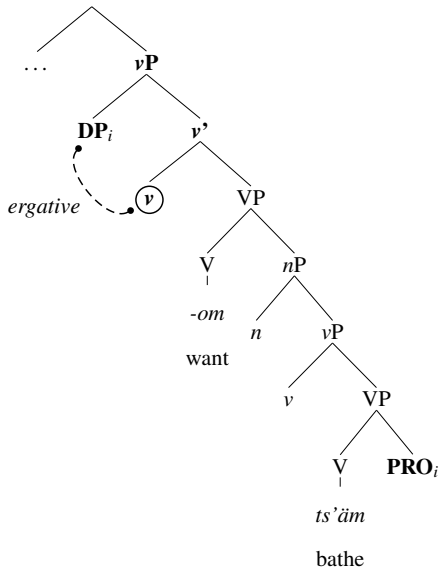
The intransitive in (62a) is illustrated in (64). As before, the embedded clause is nominalized above the *v*P layer, but this intransitive v^0 does not have a specifier; the embedded PRO subject is

controlled by the matrix subject, but ergative agreement—associated only with arguments in the specifier of *v*P—is correctly predicted to be absent form the embedded stem.[21]

(63) TRANSITIVE



(64) INTRANSITIVE



Note that it is crucial for this proposal that controlled PRO triggers ϕ-agreement. Controlled PRO has been argued to bear Case in languages like Icelandic (Harley 1995b, Sigurðsson 1991). Assuming that ϕ-features are required for Case valuation, the presence of ϕ-features on the embedded PROs here is unsurprising. This is also compatible with a movement theory of control (see e.g. Hornstein and Polinsky 2010 and works cited there), in which the matrix argument actually originates in the specifier of the embedded *v*P and would trigger agreement prior to movement.

5.3 Ergative vs. possessive

A reasonable question arises at this point: since ergative and possessive are identical, and since I claim that these "less-finite" ergative-marked forms are *nominalizations*, how can be sure that the Set A morphology we find on embedded transitives, like the one in (62b) above is not possessive

[21] An anonymous reviewer asks what governs the position of PRO. I propose that PRO in non-finite embedded clauses in Chol simply corresponds to the subject, whether this is a transitive or intransitive subject. This is in line with the observation dating back to Anderson 1976 that even in ergative languages—in which subjects do not pattern alike morphologically—subjects pattern alike with respect to control.

marking? The short answer is that we cannot. However, even if the Set A marking on (62b) is possessive (i.e. agreement between n^0 and the possessor), we still require an explanation for why this possessive marking becomes impossible on intransitives like (62a). Compare the forms in (62) above with the progressives in (65). Coon (2010b, 2013) argues extensively that progressives are matrix predicates which embed a nominalized VP, like *-om* 'want' above. However, while *-om* appears with a thematic subject, the only argument of *choñkol* is the nominalization. Progressive forms like (65a) thus show that there is no general ban on Set A marking with an intransitive form (cf. (62a) above).

(65) a. Choñkol [a-ts'äm-el].
PROG 2ERG-bathe-NML
'You're bathing.'

b. Choñkol [a-juch' jiñi ixim].
PROG 2ERG-grind DET corn
'You're grinding the corn.'

Following Coon (2010b, 2013), I assume that in (65) nominalization proceeds as in (63–64) above, but a possessive layer is added to the embedded clauses. Since *choñkol* does not take a thematic subject, there is no matrix subject to control the embedded PRO—in contrast to the matrix verb *-om* 'want' in (63–64). A possessor is thus introduced to control the PRO within the nominalization. I assume that some kind of economy principle rules out introducing a possessive layer in constructions like those in (62) above, accounting for the impossibility of Set A marking in forms like (62a).

Intransitive forms like those in (62a) and (65a) are repeated for comparison in (66), this time with overt 3rd person arguments. In both, *ts'ämel* 'bathe' is nominalized above *v*P and selects for a PRO subject. In (66a) the embedded PRO is controlled by the matrix subject and no possessor is introduced (and, for reasons of economy, no possessor is possible). In (66b) there is no matrix subject and a possessor controls PRO.

(66) a. Y-om [$_{NP}$ ts'äm-el PRO$_i$] jiñi wiñik$_i$.
2ERG-want bathe-NML DET man
'The man wants to bathe.'

b. Choñkol [$_{PossP}$ i- [$_{NP}$ ts'äm-el PRO$_i$] jiñi wiñik$_i$].
PROG 3ERG- bathe-NML DET man
'The man is bathing.'

Transitives are provided in (67). While both carry a Set A marker, only the form embedded under the progressive in (67) is proposed to contain a possessive layer; the Set A marker in (67) is proposed to be agreement between transitive v^0 and the PRO subject.[22]

(67) a. Y-om [$_{NP}$ i-juch' ixim PRO$_i$] jiñi xk'aläl$_i$.
2ERG-want 3ERG-grind corn DET girl
'The girl wants to grind corn.'

b. Choñkol [$_{PossP}$ i- [$_{NP}$ juch' ixim PRO$_i$] jiñi xk'aläl$_i$].
PROG 3ERG- grind corn DET girl
'The girl is grinding corn.'

Further support for this analysis comes from impersonal constructions, like those in (68). In a progressive intransitive, like (68a), a possessive layer may be omitted completely and an impersonal reading results (cf. arbitrary PRO). However, as predicted by the analysis above, omitting the Set A marker of a full transitive is ungrammatical, as in (68b). Because this structure contains a transitive *v*P, Set A marking is required.

(68) a. Choñkol [ts'äm-el].
PROB bathe-NML
'Bathing is happening.'

b. * Choñkol [juch' jiñi ixim].
PROG grind DET corn
intended: 'Grinding the corn is happening.'

[22]Two Set A markers are impossible on the transitive in (67b), which we might rule out on morphophonological grounds.

To summarize, while there is no way to conclusively rule out the possibility that the embedded transitives above are possessed forms (i.e. agreement is from n^0), this approach leaves us with no explanation for why the same marking is impossible on embedded *intransitives*, which are also nominalizations. The progressive forms serve to illustrate that Set A marking *is* possible on embedded intransitives in environments where there is no thematic matrix subject.[23]

5.4 Unaccusatives vs. unergatives

Finally, note that the intransitives above are all *unaccusatives*. An immediate question arises about the behavior of *unergative* subjects, which under this analysis might be predicted to trigger ergative agreement. Chol is not revealing in this respect, as unergative stems are all formally nominal; in order to predicate they must appear together with a light verb, such as the transitive *cha'l* 'do' in (69a). Coon (2013) argues that unergative nouns like *soñ* do not directly project any theta-roles. That is, these are not nominalizations, but simply event-denoting nouns. As such, the absence of person morphology on forms like (69b) is unsurprising, as there is no controlled PRO.[24]

(69) a. Tyi k-cha'l-e soñ.
PRFV 1ERG-do-DTV dance
'I danced.'

b. K-om soñ.
1ERG-want dance
'I want to dance.'

Differences in behavior of intransitives in other Mayan languages remain to be tested. For some languages, such as Kaqchikel, no evidence for a distinction between unaccusative and unergative verbs has been found (Robert Henderson, p.c.). However, note that unergatives which do not trigger ergative agreement could be proposed to sit *lower* than transitive subjects, and thus would not be expected to appear with ergative marking (Massam 2006, 2009; Wiltschko 2006).

[23] I am grateful to two anonymous reviewers for comments on this point.

[24] While the control reading is most natural, some speakers report that, in the right context, it can be interpreted as the speaker wanting dancing in general. This is thus not a relation of syntactic control, but may instead be reduced to pragmatic factors.

6. Summary and implications

In this paper, I argued that (transitive) subject agreement need not involve a higher functional head, Infl^0 or T^0, but may instead be the spell-out of a relationship between a low functional head, transitive v^0/n^0, and the NP in its specifier (transitive subject or possessor). As discussed in section 2 above, this finding has important typological and theoretical implications. In some ergative languages, such as Hindi, an ergative agreement pattern appears to be the result of regular nominative agreement from T^0 which is "interrupted" by morphological case marking on transitive subjects (see 11 and 12 above). Woolford (2000) argues that ergative-absolutive patterns of agreement *only* arise when dependent in this way on morphological ergative case marking; according to Woolford, *agreement* is always nominative (i.e. involves T^0); thus the appearance of an ergative agreement system is epiphenomenal. This paper presents evidence that at least *some* truly ergative agreement systems arise in the absence of any morphological marking on nominals.

The idea that ergative agreement can originate low and independently of morphological ergative case is not new, but has been assumed in passing in previous syntactic work on Mayan (e.g. Aissen 2010 for Tsotsil), and has also been proposed for another agreement-only ergative language, Halkomelem Salish (Wiltschko 2006). In Halkomelem, all *third person* transitive subjects trigger a special agreement suffix *-es*, as in (70). Wiltschko derives the person-split in Halkomelem by locating 1st and 2nd person clitics in a higher projection, C^0, and third person agreement low in the v^0 domain. In this paper, I hope to have added empirical evidence—both phonological and syntactic—to the existence of this type of true ergative agreement.

(70) q'ó:y-t-**es** tl' Strang te sqelá:w
kill-TV-3ERG DET Strang DET beaver
'Strang killed the beaver.' (Wiltschko 2006)

In addition to providing evidence for the existence of this possibility more generally, this proposal is consistent with recent work on "syntactic ergativity", especially A-bar extraction asymmetries in Mayan (see Coon et al. to appear). If, as Woolford proposes, transitive clauses in Mayan follow a nominative-accusative pattern of licensing and agreement, the inability to extract erga-

tive subjects in certain Mayan languages—a property found only in morphologically ergative languages—becomes mysterious. In a similar vein, this proposal is also at odds with that of Erlewine (to appear), whose account of A-bar extraction restrictions in Kaqchikel relies on ergative agreement originating from T^0. Under the proposal here, Mayan languages are truly ergative insofar as transitive subjects enter into a special agreement and licensing relationship not shared by transitive objects and intransitive subjects.

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