Little-v^0 Agreement and Templatic Morphology in Ch'ol

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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 v^0 and the transitive subject in its low base position and, in an analogous structural configuration in the nominal domain, between a possessive n^0 head 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 Ch'ol 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 Ch'ol in (1), mark transitive subjects as well as possessors of nominals.[1]

(1) a. Tyi **k**-mek'-e jiñi ñeñe'.
PFV A1-hug-TV DET baby
'I hugged the baby.'

b. **k**-otyoty
A1-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**.
PFV A3-see-TV-EP=B2
'She saw you.'

b. Tyi ts'äm-i-y=**ety**.
PFV bathe-ITV-EP=B2
'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: A – Set A (ergative/possessive); ABS – absolutive; ACC – accusative; APPL – applicative; B – Set B (absolutive); CAUS – causative; CL – noun class clitic; CLF – nominal classifier; DAT – dative; DET – determiner; DTV – derived/non-root transitive suffix; EP – epenthetic insertion; ERG – ergative; FEM – feminine; IMP – imperative; IPFV – imperfective; ITV – intransitive verb suffix; LOC – locative; MASC – masculine; NML – nominal; NOM – nominative; PASS – passive; PERF – perfect; PL – plural; PFV – perfective; SG – singular; TAM – tense, aspect, mood; 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 underlyingly nominative-aligned 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.

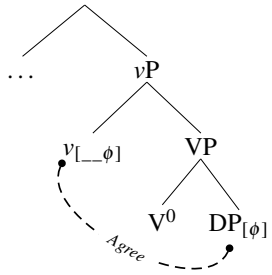
The remainder of this paper is organized as follows. In section 2 I present relevant background information, both empirical and theoretical. Section 3 turns to an overview of the two series of ϕ-indexing morphemes found in Mayan languages, with particular attention to Ch'ol, a language of Chiapas, Mexico. 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

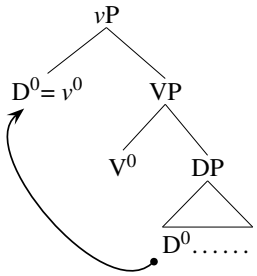
2.1 Agreement vs. clitics

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, as in (3), or (ii) pronominal clitics, as in (4).

(3) AGREEMENT



(4) PRONOMINAL CLITIC



Following Chomsky 2000, Chomsky 2001, and much subsequent work, I take agreement morphology to be the result of a feature valuation relationship relationship between a probe with unvalued ϕ-features and a goal DP. The probe searches the derivation for a ϕ-feature-bearing element (object agreement with v^0 is schematized in (3)); when an *Agree* relation is established, the probe's ϕ-features are valued, and spelled out as agreement.

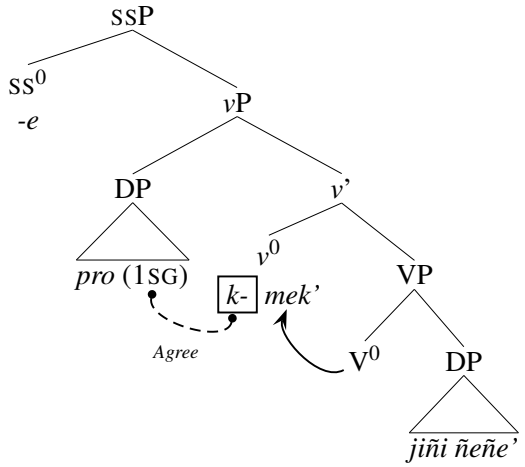
Pronominal clitics, in contrast, are essentially small, morphologically-bound pronouns. Under a movement approach to clitic-doubling, as schematized in (4), clitics are D^0 elements which move from inside a larger DP to attach to a functional head such as T^0 (Anagnostopoulou 2003) or v^0 (Nevins 2011). The generation and/or movement of pronominal clitics may be the result of an *Agree* relation, though the crucial difference between these and "true" agreement morphemes is that clitics are D^0 heads while pure agreement morphology is the morphological realization of features which have been valued by *Agree*; see discussion in Harizanov 2014, Kramer 2014, and Preminger 2014. Many languages show phonological differences between pronominal clitics and agreement morphemes—the former behaving as phonological clitics, and the latter as affixes—though this correlation is not perfect. We return to this issue in section 4.

In this paper I argue that Ch'ol utilizes both strategies: Set A morphemes are agreement, while

Set B markers are pronominal clitics. In the verbal domain, I argue that the Set A markers spell out an agreement relationship between transitive v^0 and the transitive subject in its base position, as shown in (5).

(5) a. Tyi k-mek'-e jiñi ñeñe'.
PFV A1-hug-TV DET baby
'I hugged the baby.'

b.



In (5), the verb root *mek'* 'hug' undergoes head movement to v^0 and the transitive subject (here a null pronominal) is merged in Spec,*v*P. I assume that transitive subjects are assigned inherent ergative case in their base positions (see Woolford 1997, 2006; Laka 2006; Legate 2008; Aldridge 2004). Assuming that feature sharing goes hand-in-hand with case assignment, agreement between v^0 and its specifier is unsuprising; in (5) this agreement is spelled out as 1st person Set A *k-*. The verb stem then undergoes further movement to the head which hosts the stem-final "status suffix" *-e*. The status suffix is glossed 'TV' and located in a neutrally-labelled projection, "SSP" (status suffix phrase), which demarcates the edge of the verbal projection; see e.g. Henderson 2012 on status suffixes.[2] Higher functional material is not involved in the licensing or agreement of ergative

[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 agreeing head is v^0 or Voice^0 (or the two are bundled together, as in Harley to appear), or whether the agreement takes place between a specifier and its head, or in some other local configuration (e.g. between the head hosting the status suffix and the external argument). While the picture sketched is consistent with an inherent approach to ergative case assignment, alternatives are possible and the main claim is simply that the agreement relationship takes place low, internal to the extended verbal projection, and does not involve Infl^0 or T^0.

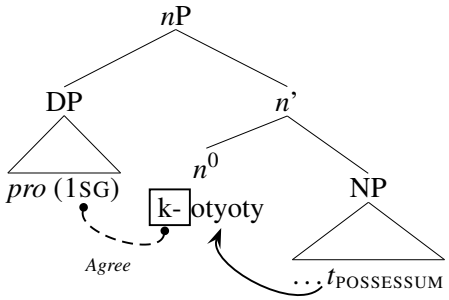
subjects, making (transitive) subject agreement in Ch'ol very different from subject agreement in English. Stem derivation is discussed further in section 3 below.

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). In parallel with (5) above, the possessor is located in the specifier of a nominal functional projection, *n*P, where I assume it receives inherent genitive case. 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. 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.

(6) a. k-otyoty.
A1-house

'my house'

b.



Turning now to Set B morphology, I follow Coon et al. 2014 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. Ch'ol falls into the latter category (Coon 2013; Coon et al. 2014). In Ch'ol, transitive objects are licensed by v^0 (i.e. receive structural accusative case), while intransitive subjects are licensed by finite Infl^0 (i.e. receive structural nominative case); absolutive clitics are a morphological default used to spell out both nominative and accusative. The proposal is summarized in (7).

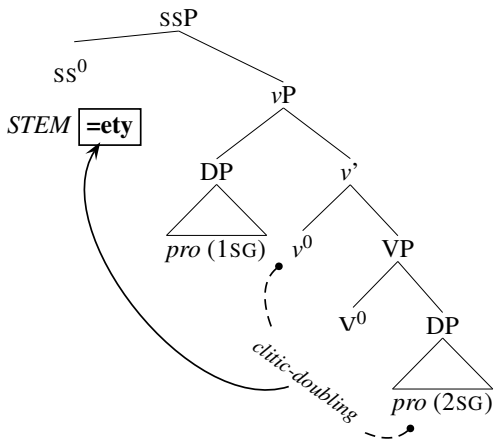
(7) PROPOSAL FOR CH'OL

	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 the appearance of the Set B clitic *=ety*, which attaches to the verb stem (I set aside the exact mechanism of cliticization here as the primary focus is on Set A agreement; see works cited above for discussion).

(8) a. Tyi k-mek'-e-y=**ety**.
PFV A1-hug-TV-EP=B2
'I hugged you.'

b.



Note that under this account, transitive v^0 is responsible both for the absolutive clitic and the ergative agreement, though nothing crucial hinges on this being a single head, two separate low heads, or a fused v^0/Voice^0 head (see footnote 2). Phonological differences in level of attachment, discussed in section 4 below, support the proposal here that Set A and Set B morphemes are the result of different morhphosyntactic processes.

Evidence that Set B morphemes cliticize to the edge of the raised verb stem (rather than, for example, simply being located in its base, postverbal 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**.
PFV A2-make-APPL tortilla DET boy
'You made the boy tortillas.'

b. Tyi a-mel-be-y=**oñ** waj.
PFV A2-make-APPL-EP=B1 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. This section examines these relationships and their typological implications in more detail.

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.[3]

(10)

AGREEMENT / CASE	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 *-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

[3]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.

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, Bhatt 2005).

(12) Raam roTii khaataa
agree
Raam(MASC) bread(FEM) eat.IPFV.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

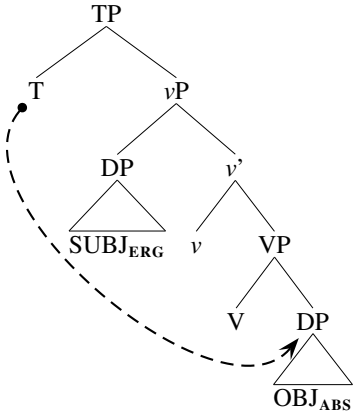
a. Við lásum bókina
agree
we.NOM read.1PL the.book.ACC
'We read the book.' (Sigurðsson 1996)

b. Morgum studentum liki verkið.
agree
many student.PL.DAT like.3SG the.job.NOM
'Many students like the job.' (Harley 1995a)

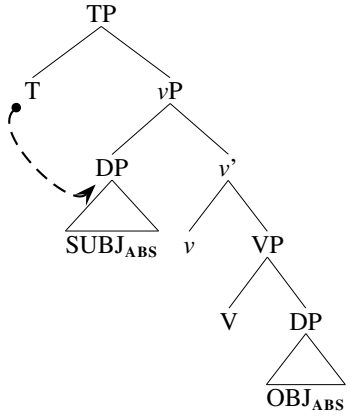
The apparent "ergative" agreement pattern of Hindi-Urdu, then, can be reduced to regular nominative agreement originating in T^0, plus the restriction that morphologically marked (i.e. ergative, dative) subjects are unable to trigger agreement, just as morphologically marked dative subjects are unable to trigger agreement in Icelandic. The marked-subject ("ergative") construction is schema-

tized 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 agreement (i.e. agreement from T^0) 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 subject. This raises the question of what happens in those language with ergative agreement systems but *no* morphological case marking on nominals, to which we turn 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 in Mayan, 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/Set A) is marked by agreement, while object agreement (absolutive/Set B) 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'.
IPFV=B2 A1-see-TV
'I see you.'

b. Ch=**ach** toy-i.
IPFV=B2 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 ergative case marking. This ergative case blocks agreement from T^0, resulting in nominative (= absolutive) agreement on the unmarked object. While the agreement is simply nominative agreement, case assignment still follows an ergative pattern. In Woolford's account of Popti', however, there is no system of (abstract) ergative case assignment. 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.

I claim that not only is a nominative analysis of Set A agreement incompatible with the Mayan 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). I return to this issue in section 6.

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 sub-

ject. 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 Ch'ol nominal licensing *is* underlyingly ergative insofar as transitive subjects receive special licensing internal to *v*P.[4] 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 and Coon (to appear) for overviews; Mateo-Toledo 2008 and Coon et al. 2014 on Q'anjob'al; Woolford 2000 on Popti'; Coon 2013 on Ch'ol; and Preminger 2014 on Kaqchikel (cf. Shklovsky 2012 for more nuanced discussion of Tseltal). See also Kaufman 1990 and Robertson 1992 for further historical evidence.

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 Ch'ol (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.

[4] 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.

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. Most verbal predicates are preceded by a tense–aspect–mood marker (TAM) and there is variation as to whether this forms a single word with the verb stem. See Grinevald and Peake (2012), Bennett et al. (to appear), and Coon (to appear) for overviews of the Mayan family and Mayan morphosyntax.

(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 Ch'ol (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 Ch'ol the Set A markers indicate only person features. To indicate plurality, "omnivorous" plural morphemes (see Nevins 2011)—which may pluralize either ergative or absolutive arguments—appear in addition to the prefix.

(22) CH'OL

	__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. 2014 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 Ch'ol, 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.
PFV-B1-A3-see CLF.MASC man
'The man saw me.'

b. Winak-**in**.
man-B1
'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) CH'OL

	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 Ch'ol 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 Ch'ol. 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 Ch'ol). Examples of Ch'ol CVC and VC roots from different categories are given in (28).

(28)

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

In word-initial position, the roots in the right column are pronounced with an initial glottal stop, [ʔVC], illustrated by the imperative in (29a).[5] 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), or the masculine equivalent *aj*= [ah=] in (29c).

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

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

c. [**ah=ʔil**-k'iŋ] (*aj=il-k'iñ*)
CL=see-party
'pilgrim'

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

The clitics *x*= and *aj*= are historically related to feminine and masculine gender markers, respectively, and are still found on many nouns denoting humans, animals, and plants (Vázquez Álvarez 2011). In present-day Ch'ol, these clitics have been bleached of their gender information. For example, the referents of (29b–c) could be male or female and in the Tila dialect proper names typically occur preceded by *aj*= regardless of gender. These clitics are also frequently found on agentive nominals, though they do not appear to be nominalizers (i.e. n^0), per se, as forms like (29b) are also fine without *x*=. See Arcos López 2009 for details.

The same pattern is seen in vowel-initial noun roots like *ixik* 'woman' and *ich* 'pepper', which are pronounced with a glottal stop (i) word-initially and (ii) when preceded by the clitics, as shown in (30).

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

b. [ʔitʃ], *[ah-itʃ], [**ah=ʔ**itʃ]
pepper, CL=pepper, CL=pepper
'pepper'

Note that this is not a phonotactic constraint: the sequences [ʃ-V] and [h-V] are licit elsewhere in the language, as in *xux* [ʃuʃ] 'wasp' or *ja'* [haʔ] 'water'.

In contrast, when a Set A marker precedes a vowel-initial root, the glottal stop does not appear. Recall that Set A prefixes have pre-consonantal and pre-vocalic allomorphs. Compare the Ch'ol 2nd person possessive forms in (31).[6]

(31) a. [**aw**-uskuɲ] (*aw-uskuñ*)
A2-older.brother
'your older brother'

b. [**a**-ʧitʃ] (*a-chich*)
A2-older.sister
'your older sister'

[6]There is an all-purpose epenthetic glide in Ch'ol, 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.

Rather than inserting a glottal stop, the pre-vocalic allomorph of the Set A morpheme is used with vowel-initial roots, as shown by the forms in (32). A glottal stop here with the pre-consonantal Set A allomorph is ungrammatical, even though these forms would satisfy Ch'ol's phonotactic restriction against vowel hiatus.

(32) a. Tyi [**aw-ɨk'**]-e-y=oñ. *[**a-ʔɨk'**]-e-y-oñ
PFV 2ERG-give-TV-EP=1ABS
'You gave it to me.'

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

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 (to appear)). 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 to appear, 11).

Below I formalize this proposed principle 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 Set A marker blocks insertion of the glottal stop. Furthermore, the choice of the Set A marker (pre-vocalic or pre-consonantal) is sensitive to the shape of the root (VC or CVC). 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, Ch'ol 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 .
PFV A1-give-APPL-EP=B2
'I gave it to you.'

b. Tyi **[ʔak']**-eñ-ty-i-y=oñ k-chityam.
PFV give-APPL-PASS-ITV-EP=B1 A1-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 [-ɨŋ] when preceding inflectional morphology, like the passive in (34a), but as [-aŋ] word-finally (34b), and when followed by an enclitic, like the second position clitic *=ix* [=iʃ] in (34c).

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

b. Mi [k-wɨj-is**-aŋ**] ñeñe'. (*wäy-is-añ*)
IPFV A1-sleep-CAUS-SUF baby
'I made the baby sleep.'

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

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

(35) a. Mi [k-wɨj-is-**aŋ=etʲ**]. (*k-wäy-is-añ=ety*)
IPFV A1-sleep-CAUS-SUF=B2
'I made you sleep.'

b. * Mi [k-wɨj-is-**ɨŋ=etʲ**]. (**k-wäy-is-äñ=ety*)
IPFV A1-sleep-CAUS-SUF=B2

The table in (36) summarizes the facts presented so far in this section. Set B markers pattern with clitics and word edges in conditioning the vowel [a]; since Set B morphemes never precede the root, the appearance of a glottal stop cannot be tested. Set A morphemes, in contrast, pattern with word-internal inflectional morphology. Notably, the Set A 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).[7] Though further work is needed on Set B morphemes, the focus in this paper is the status of Set A. I show in the following section that in order to capture

[7] See also Bennett and Henderson 2014 and Bennett, Harizanov, and Henderson 2015 on Kaqchikel Set B markers, which behave alternately as phonological clitics or affixes, depending on the prosodic environment in which they occur.

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) above, that vowel-initial roots appear with an initial glottal stop word-initially and when preceded by the clitics [ʃ=] or [ah=], but this glottal stop is not present when the root is preceded by a Set A ergative morpheme. Furthermore, the Set A morphemes have special allomorph forms for use with vowel-initial roots. The very existence of this type of allomorphy suggests an underlying difference between vowel-initial [VC] and other [CVC] roots (as opposed to an analysis in which the initial glottal stop is underlying present in the vowel-initial forms). That 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 (to appear) for citations and discussion.

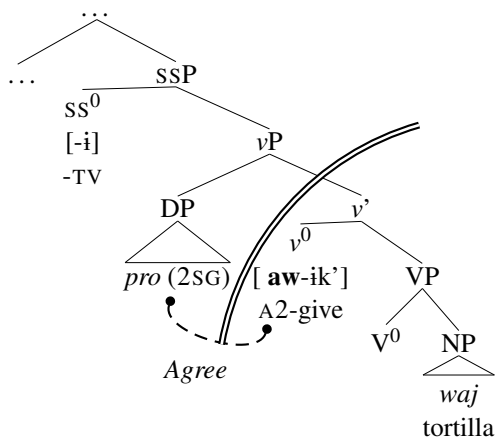
I propose that roots in Ch'ol must be associated with a CVC melodic template (McCarthy 1979, 1981, discussed below), and that this association takes place at the *v*P/*n*P phase.[8] Crucially, Set A agreement takes place before the phase is spelled out. A verbal derivation is shown in (37).[9]

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

[9]Note that it is crucial that this constraint make direct reference to the root, since the ergative prefixes do not themselves appear with onsets (*[ʔaw-ik'-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 Ch'ol's *x*= [ʃ=] or *aj*= [ah=] which, for her, should attach outside the PWd but nonetheless bleed glottal insertion.

(37) a. Tyi [aw-ik'-i] waj. (*aw-äk'-ä*)
PFV A2-give-TV tortilla
'You gave tortillas.'

b.

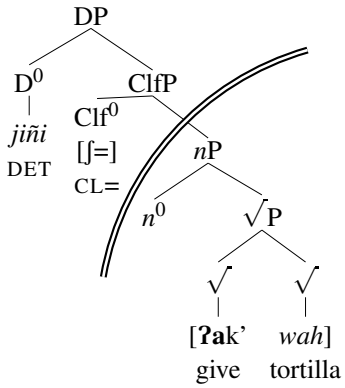


The derivation in (37b) works as follows. The vowel-initial root *Ak'* 'give' raises to v^0 and the 2nd person subject is merged in Spec,*v*P. The complex v^0 head enters into an *Agree* relationship with the subject (during which inherent ergative case assignment also takes place), triggering the appearance of the prevocalic allomorph of the ergative prefix on the stem. I assume that *v*P phase includes the v^0 head and its complement, and that this material is spelled out *after* Set A agreement occurs, upon merge of the next highest phase head (Chomsky 2001 and subsequent work). The stem then undergoes head movement to the head hosting the status suffix, SS^0. Though other representations and labels are possible, the important point is that agreement with the transitive subject takes place internal to the phase, which excludes T^0/Infl^0.

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 /VC/ 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. Similar facts hold for the clitic *aj*= [ah=].

(38)



The proposal that Ch'ol 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 Set A agreement were actually nominative agreement (i.e. the result of a relationship between T^0 and the external argument), we would lose the ability to capture the different behavior of the Set A 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=] and *aj*= [ah=] clitics attach 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 Roots and templates

In this section I spell out the requirement that roots in Ch'ol 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). Arabic verbal roots typically consist of three consonants, which appear in different patterns, sometimes called *binyanim*, as shown for the root *ktb* 'write' in (39).

(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 Mayan languages by Lois (2011). In Mayan, 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:

> 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).

Ch'ol's possibilities are even less robust, but one vowel alternation in transitive roots is completely productive. Active CVC transitive roots form unaccusative (passive) stems with a change in vowel quality represented as CVC→CVjC (recall that orthographic *j* is IPA [h]), as shown by the forms in (42). These *Vj* vowels begin as modal (voiced) vowels and become breathy (voiceless) during their second half.[10,11] These *Vj* vowels also cause root-final consonants to devoice.

[10]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 a consonantal segment, [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.

[11]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 Ch'ol's unaccusative roots are CVjC in shape, though they contain no CVC transitive counterpart, e.g. *majl* [ma$^{\text{h}}$l̥] 'go', and *yajl* [ja$^{\text{h}}$l̥] 'fall'. I suggest this lends further support to the analysis of CVC→CVjC as involving a vowel quality alternation, rather than an infix (see footnote 10).

(42) CH'OL 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}n̥]	'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'

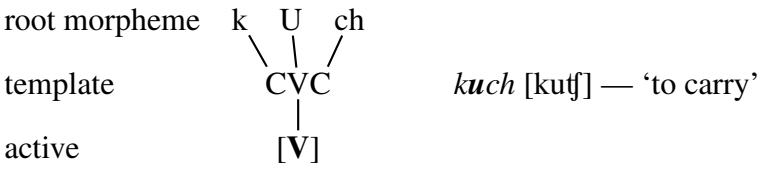
An example of an active–passive pair is shown in (43).

(43) a. Tyi i-**kuch**-u-y=oñ.
PFV A3-carry-TV-EP=B1
'She carried me.'

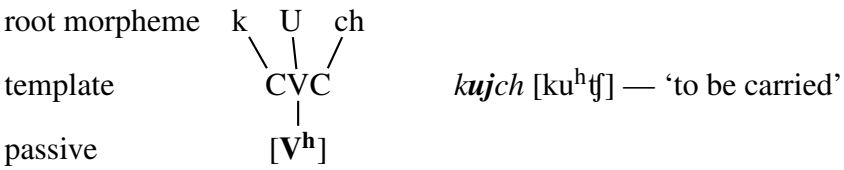
b. Tyi **kujch**-i-y=oñ.
PFV carry.PASS-ITV-EP=B1
'I was carried.'

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: plain in the active/transitive, and long and breathy in the passive/unaccusative.

(44) ACTIVE

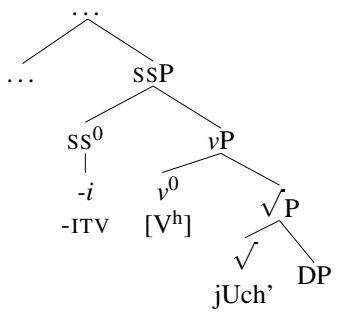


(45) PASSIVE



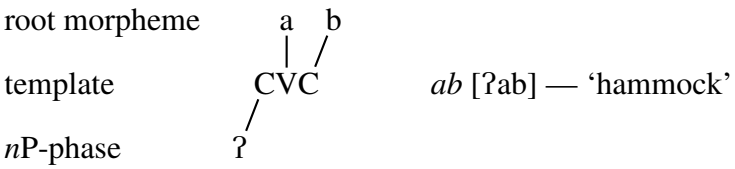
Following Arad (2003) on Hebrew and Lois (2011) on Yucatecan, I assume that the inflectional tier corresponds to *v*P/VoiceP, as shown in (46) for the passive form in (43b)/(45).

(46)



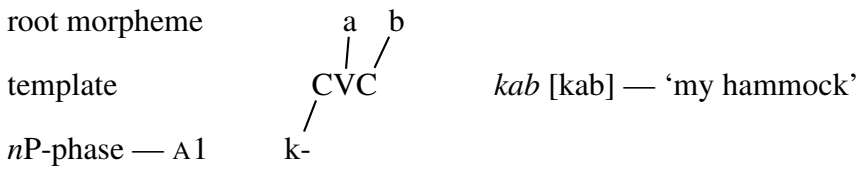
With this background in place, we now return to the connection to vowel-initial roots, the CVC requirement, and the location of the ergative morpheme. In particular I argue, following work cited above and discussed in detail in Bennett (to appear), that these roots are underlyingly vowel initial—/VC/—and 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 the presence of a Set A morpheme—this material fills the C slot of the template and no glottal insertion occurs, as shown in (48).

(48) POSSESSED VOWEL-INITIAL ROOT



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.[12] 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 Ch'ol must associate with a CVC template (**ii**) this association takes place internal to 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 both with work on Semitic and Yucatecan languages, which suggests that the inflectional melody is inserted at the phase (Arad 2003; Lois 2011), as well as with Mayan-internal work proposing that the glottal stop which appears in vowel-initial roots is not underlying (Bennett to appear).[13] That is, Ch'ol roots may be either /CVC/ or /VC/.

[12]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 Ch'ol, while 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, in principle nothing rules out this possibility and the main claim of this paper—that higher functional heads are not involved in the realization of Set A morphemes—would still be maintained.

[13]Judith Aissen (p.c.) raises the question of how reduplicated vowel-initial roots can be captured under this approach. For example, the vowel-initial root *ik'* [ʔik'] 'air, wind' reduplicates to form *i'ik'* [ʔiʔik'] 'black'. Marantz (1982) proposes that in reduplication, what is reduplicated is McCarthy's CV skeletal tier. In a reduplicated form like *säsäk* [sisɨk] 'white' (from the CVC root *säk* [sɨk] 'clean'), consonants and vowels from the root are copied to fill the C and V slots of the reduplicant. For a vowel initial root like [ik'] I propose that the epenthetic glottal stop is inserted to fill *both* the C slot of both the root and reduplicant.

Notably, when a vowel-initial reduplicated form is preceded by a Set A marker, possible only in a very limited number of examples such as those in (i), the glides from the 2nd and 3rd person possessive morphemes fill the C slot of the roots.

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 Ch'ol, summarized in (49). 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.

(49)

	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 Ch'ol 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

(i) a. Baki añ [**aw**-i**w**ik'-mut^{j}]? *(awiwik'-muty)*
where LOC A2-black-chicken
'Where is your black chicken?'

b. Baki añ [**j**-i**j**ik'-mut^{j}]? *(yiyik'-muty)*
where LOC A3-black-chicken
'Where's his black chicken?

These forms would be difficult to account for if the glottal stop were underlyingly part of the root. Note further that this is not an instance of spreading, as word-internal glottal stops in analogous but non-reduplicated environments are not replaced by glides. Compare *e'tyel* [ʔeʔtʲel] 'work' and *aw-eʔtyel* [aw-eʔtʲel] 'your work'.

The 1st person prefix, *k-*, does not show the same pattern that we saw in (i) above. Instead, the glottal stop appears in the stem form: [**k**-i**ʔ**ik'-mut^{j}]. This is also the only form of the three Set A markers 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 understand these forms.

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 (50). 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 Ch'ol and thus does not appear with TAM marking (see Vázquez Álvarez 2011, Coon 2013).

(50) a. K-om [$_{CP}$ che' **mi** **a**-wuts' jiñi pisil].
A1-want that IPFV A2-wash the clothes
'I want that you wash the clothes.'

b. Tyi y-äl-ä [$_{CP}$ che' **tyi** yajl-i-y=**ety**.].
PFV A3-say-TV that PFV fall-ITV-EP=B2
'She said that you fell.'

Examples of clearly non-finite embedded clauses are shown in (51). Both TAM and ϕ-marking are impossible here, and there is an obligatory control relation between the matrix and embedded subjects. The intransitive in (51a) appears with a nominalizing suffix *-el*. I follow previous work which takes all non-finite embedded clauses in Ch'ol to be nominal(ized) complements to the matrix verb (Coon 2010a, Coon 2013).

(51) a. **K**-om [$_{NP}$ wäy-el].
A1-want sleep-NML
'I want to sleep.'

b. **K**-om [$_{NP}$ jap kajpe'].
A1-want drink coffee
'I want to drink coffee.'

Though the embedded form in (51b) appears to be transitive, this is misleading. In forms like (51b), known as "incorporation antipassives" (see e.g. Dayley 1981), the internal argument must be bare and non-referential. As with the intransitive stem in (51a), 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 (52a), 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 Ch'ol receive structural accusative case from transitive v^0 (cf. Legate's ABS=DEF discussed in section 2.1 above and Coon et al. 2014); 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 (52b).

(52) a. * K-om [jap **jiñi** kajpe'].
A1-want drink DET coffee
intended: 'I want to drink the coffee.'

b. ✔ K-om [$_{NP}$ **k**-jap **jiñi** kajpe'].
A1-want A1-drink DET coffee
'I want to drink the coffee.'

Unlike the finite clauses in (50) above, the "less-finite" embedded transitive in (52b) may not appear with a complementizer, shown by the form in (53a). While person marking appears on both matrix and embedded verb stems, these markers *must* be co-referential, as shown by the ungrammaticality of (53b). For disjoint reference of matrix and embedded subjects, a fully finite form—with a complementizer and aspect—must be used, as in (53c).[14]

(53) a. **K**-om [$_{NP}$ (*che') **k**-mek'=ety].
A1-want that A1-hug=B2
'I want to hug you.'

[14]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. * **K**-om [**i**-mek'=ety].
A1-want A3-hug=B2

intended: 'I want her to hug you.'

c. **K**-om [$_{CP}$ **che' mi** **i**-mek'=ety].
A1-want that IPFV A3-hug=B2

'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 (54). Intransitives may not appear with ergative subject marking, while transitives must.

(54) a. **Aw**-om [$_{NP}$ (*a-)ts'äm-el].
A2-want A2-bathe-NML

'You want to bathe.'

b. **Aw**-om [$_{NP}$ *(**a**-)juch' jiñi ixim].
A2-want A2-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 Ch'ol 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 Set A 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

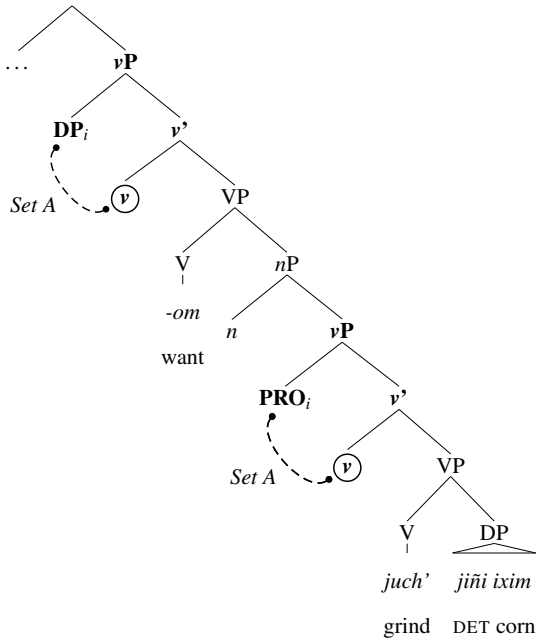
Nominal licensing and ϕ-agreement are only expected to correlate with finiteness when Infl^0 is the functional head responsible for licensing a particular nominal. Nominative case on subjects—assigned by T^0/Infl^0—is lost in non-finite environments in nominative-accusative languages like

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. 2014 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.

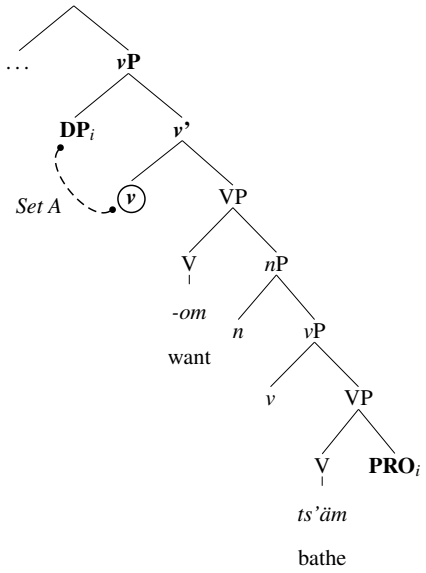
I argue that the TAMless embedded transitives are nominalized above transitive *v*P, and that this nominalized stem serves as the complement of the transitive matrix verb *-om* 'want'. The structure of the transitive (54b) above is shown in (55). The embedded subject is controlled PRO, explaining the 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 (54a) is illustrated in (56). 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 Set A agreement—associated only with arguments in the specifier of *v*P—is correctly predicted to be absent form the embedded stem.[15]

(55) TRANSITIVE



(56) INTRANSITIVE



[15] An anonymous reviewer asks what governs the position of PRO. I propose that PRO in non-finite embedded clauses in Ch'ol 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.

Note that it is crucial for this proposal that controlled PRO triggers ϕ-agreement. Controlled PRO has been argued to bear case features in languages like Icelandic (Harley 1995b, Sigurðsson 1991). Assuming that ϕ-feature sharing is 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 morphology is identical (Set A), 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 (54b) above is not possessive marking? The short answer is that we cannot. However, even if the Set A marking on (54b) 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 (54a). Compare the forms in (54) above with the progressives in (57). 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 (57a) thus show that there is no general ban on Set A marking with an intransitive form (cf. (54a) above).

(57) a. Choñkol [a-ts'äm-el].
PROG A2-bathe-NML
'You're bathing.'

b. Choñkol [a-juch' jiñi ixim].
PROG A2-grind DET corn
'You're grinding the corn.'

Following Coon (2010b, 2013), I assume that in (57) nominalization proceeds as in (55–56) 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 (55–56). 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 (54) above, accounting for the impossibility of Set A marking in forms like (54a).

Intransitive forms like those in (54a) and (57a) are repeated for comparison in (58), this time with overt 3rd person arguments. In both, *ts'ämel* 'bathe' is nominalized above *v*P and selects for a PRO subject. In (58a) the embedded PRO is controlled by the matrix subject and no possessor is introduced (and, for reasons of economy, no possessor is possible). In (58b) there is no matrix subject and a possessor controls PRO.

(58) a. Y-om [$_{NP}$ ts'äm-el PRO$_i$] jiñi wiñik$_i$.
A3-want bathe-NML DET man
'The man wants to bathe.'

b. Choñkol [$_{PossP}$ i- [$_{NP}$ ts'äm-el PRO$_i$] jiñi wiñik$_i$].
PROG A3- bathe-NML DET man
'The man is bathing.'

Transitives are provided in (59). While both carry a Set A marker, only the form embedded under the progressive in (59) is proposed to contain a possessive layer; the Set A marker in (59) is proposed to be agreement between transitive *v*^{0} and the PRO subject.[16]

(59) a. Y-om [$_{NP}$ i-mek'=ety PRO$_i$] jiñi xk'aläl$_i$.
A3-want A3-hug=B2 DET girl
'The girl wants to hug you.'

b. Choñkol [$_{PossP}$ i- [$_{NP}$ mek'=ety PRO$_i$] jiñi xk'aläl$_i$].
PROG A3- hug=B2 DET girl
'The girl is hugging you.'

Further support for this analysis comes from impersonal constructions, like those in (60). In

[16]Two Set A markers are impossible on the transitive in (59b), which we might rule out on morphophonological grounds.

a progressive intransitive, like (60a), 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 (60b). Because this structure contains a transitive *v*P, Set A marking is required.

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

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

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.[17]

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. Ch'ol 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 (61a); see Gutiérrez Sánchez 2004. 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 (61b) is unsurprising, as there is no controlled PRO.[18]

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

[18] While the control reading is most natural, some speakers report that, in the right context, the sentence in (61b) could 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.

(61) a. Tyi k-cha'l-e soñ.
PFV A1-do-DTV dance
'I danced.'

b. K-om soñ.
A1-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).

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 (62). 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.

(62) 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. 2014). If, as Woolford proposes, transitive clauses in Mayan follow a nominative-accusative pattern of licensing and agreement, the inability to extract ergative 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 (2016), whose account of A-bar extraction restrictions in Kaqchikel relies on ergative agreement originating from T^0 (see Henderson and Coon 2016 for discussion). 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.

Finally, note that the existence of true ergative agreement systems—ergative agreement that arises low, in connection with transitive v^0 or some other low functional head—raises questions for the typological gap in (10) discussed in section 2.2 above. Specifically, recall that there are no clear attested examples of languages with both nominative–accusative morphological case and ergative–absolutive agreement (though the reverse situation is possible). Woolford (2000) and Bobaljik (2008) suggest that this gap may be explained if "ergative" agreement is *always* agreement from T^0 (nominative) interrupted by morphological ergative on the subject, as in Hindi-Urdu above. However, under the proposal argued for here that ergative agreement may arise directly from v^0, something else must rule out languages in the upper–right cell in (10)—namely, a Ch'ol-*prime* with both ergative agreement and morphological accusative case on transitive objects.

I suggest that while ergative agreement need not be dependent on morphological ergative case, it is dependent on *abstract* ergative case or licensing. Specifically, under an inherent approach to ergative case (see Woolford 1997, 2006; Laka 2006; Legate 2008; Aldridge 2004, and others), transitive subjects are licensed by a low functional head. If this licensing relationship is a prerequisite for ergative agreement, we may still have an explanation for the gap. I suggest this provides support in favor of the existence of inherent ergative case assignment as at least one option made available by Universal Grammar (cf. Baker and Bobaljik to appear).

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