

The genetic matrix of Mayan applicative acquisition*

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Abstract

This article uses data on Mayan applicative constructions to demonstrate the use of a comparative method for language acquisition research. Mayan languages express indirect objects through an applicative suffix on verbs, a prepositional phrase, or the possessor of the direct object. Mayan children must also acquire language specific lexical constraints on the applicative suffix. Learners cannot resolve the setting for these parameters through positive evidence.

Two-year old children learning the Mayan languages K'iche' and Tzeltal demonstrate language specific acquisition patterns. Children learning K'iche' omit the preposition at the head of the indirect object phrase, but retain the ergative cross-reference markers. Children learning Tzeltal sometimes omit the applicative suffix on the verb, but retain the absolutive cross-reference markers. Tzeltal children begin producing the applicative suffix a year earlier than children learning K'iche'.

The Mayan acquisition data refute Crain and Pietroski's (2002) Continuity proposal. There is no evidence that K'iche' children extend the applicative along Tzeltalan lines or that Tzeltalan children extend prepositions in the K'iche' manner. The comparative Mayan data also refute Pinker's (1989) theory of narrow semantic verb classes in that the applicative suffix is not constrained by narrow semantic classes of verbs, but rather by the patterns of usage within a given society. The comparative method offers a systematic framework for assessing claims about the nature of children's language.

1. Introduction

This article demonstrates how to apply the comparative method to the study of language acquisition, and by extension, to all synchronic

language studies. Historical linguists have employed the comparative method over the course of the past three centuries to reconstruct prehistoric changes in phonology, morphology, syntax, semantics and the lexicon. The comparative method also enables linguists to reconstruct the geographic locations and beliefs of preliterate societies (Watkins 1985). The key to the success of the comparative method is its use of genetically related languages. This restriction allows linguists to generalize effectively beyond single languages without sacrificing a high standard of precision (Port and Leary 2005). This study demonstrates the benefit of employing the comparative method in the study of language acquisition.

My study uses data from the Mayan language family. The Mayan data are the result of more than three decades of modern linguistic description by native Mayan and non-native linguists alike. As demonstrated throughout this article, this outstanding database is an integral part of the comparative method. The Mayan language family contains some 30 separate languages with over seven million living speakers. The languages fall into four main historical subdivisions (Figure 1).

Mayan languages have a largely agglutinative morphology with an ergative type of cross-referencing verb inflection (Kaufman 1990). The ergative inflections typically cross-reference the subjects of transitive verbs and nominal possessors. The absolutive inflections cross-reference subjects of intransitive verbs, direct objects of transitive verbs and subjects of nonverbal predicates. There are prevocalic and preconsonantal allomorphs of the ergative markers. Nominal arguments for subject, direct object and possessors are only used for emphasis or to disambiguate the reference of the pronominal cross-reference markers on verbs and nouns. Verbal utterances usually contain obligatory particles for aspect that

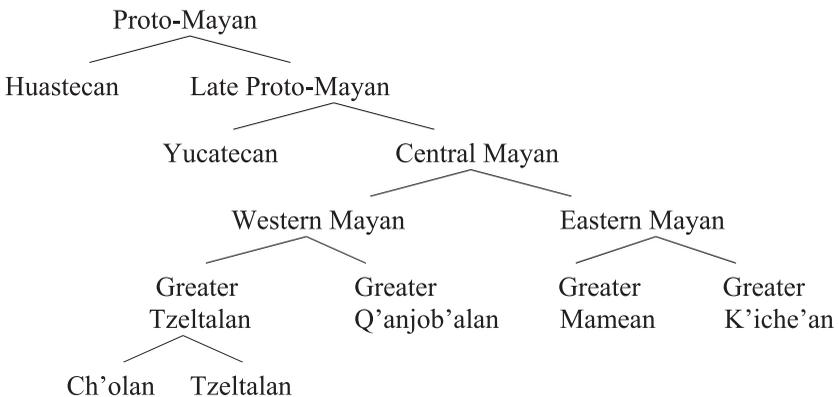


Figure 1. Genetic classification of Mayan languages (Kaufman 1976, 1990)

coordinate with verbal status suffixes. The languages generally have a verb-initial underlying word order. Some languages have a verb, subject, object word order while others have a verb, object, subject word order. The underlying order varies with changes in definiteness and animacy (England 1992).

2. Applicatives

In this article I focus on the acquisition of the Mayan applicative construction. In general, the applicative promotes indirect or secondary objects to direct or primary objects and demotes the original direct object to a secondary object or an adjunct phrase (Baker 1988; Dryer 1986). The English applicative advances dative and beneficiary adjuncts to primary objects and demotes the original direct objects to secondary object status (1).

(1) English applicative constructions

a. Dative

Susan	gave	me	a rose.
SUBJECT		RECIPIENT	THEME

b. Benefactive

Donald	baked	me	a cake.
SUBJECT		BENEFICIARY	THEME

This example illustrates several general dimensions of applicative constructions. They promote an adjunct phrase to a primary object. The former object may or may not be demoted to a secondary object or adjunct phrase. The English applicative construction applies to some functions (e.g. datives, beneficiaries, addressees) and not to others (e.g. malefactive, instruments, circumstances). There may be lexical exceptions to the construction. These exceptions may be either positive or negative in character (Bowerman 1988; Pinker 1989). The unpromoted indirect objects have a variety of specific markers (adpositions or case marking). Finally, the promoted argument may be subject to further changes through passive and antipassive constructions. I will use Dryer's (1986) terminology throughout my discussion of Mayan applicatives. The dative and beneficiary NPs in (1) have assumed primary object status while the themes have the syntactic status of secondary objects. The term 'indirect' refers to dative, beneficiary, addressee, etc. arguments as adjunct phrases. The following section presents the details of the Mayan applicative constructions.

2.1. *Mayan applicatives*

Mayan languages as a whole are not given to the use of three-place predicates. Mayan verbs usually only cross-reference a maximum of two arguments, i.e. the subject and direct object.¹ The languages typically express an indirect object as an oblique argument headed by a prepositional phrase (2). Kaufman (1990) following Dayley (1981) reconstructs the applicative suffix **-b'e* for Proto-Mayan which promotes a third person verb adjunct to a primary object, and demotes the former direct object to an oblique phrase (see also Mora-Marín 2003). A form of this suffix is found in the Eastern and Western Mayan languages although it is missing in the Yucatecan and Huastecan branches. Examples of the K'iche' applicative construction are shown in (3).²

- (2) K'iche'
 x-Ø-in-ya' jun ch'iich' chi-aw-ee
 COMP-B3-A1-give one machete PREP-A2-of
 'I gave a machete to you.'
- (3) a. ch'iich' x-Ø-in-sok-b'ee-j aw-eech
 machete COMP-B3-A1-wound-APL-VTD A2-of
 'It was a machete that I wounded you with'
 (Dayley 1981: 28)
- b. aree w-aqan k-Ø-in-b'iin-ib'ee-j
 FOC A1-foot INC-B3-A1-travel-APL-VTD
 'I use my feet to travel'
 (Mondloch 1981: 278)

In (3a), the transitive verb *sok* has the applicative suffix *-b'ee*. The former oblique argument *ch'iich'* 'machete' has been promoted to a primary object where it triggers the third person Set B (absolutive) agreement on the verb. The instrument phrase has further advanced to a cleft phrase in preverbal position for focus. The former direct object is realized in an oblique syntactic position headed by the relational noun *-e* 'of'. In (3b), the applicative suffix *-ib'ee* was added to the intransitive verb *b'iin*, which created a transitive stem with the instrument as primary object and advanced to a preverbal focus position.

2.2. *Applicative parameters*

Comparing the applicative construction across the Mayan languages reveals fascinating differences in practically every characteristic of the applicative. In this section I provide a brief description for four of these

parameters.³ Interested readers should consult the descriptions provided by Dayley (1981) and Mora-Marín (2003) for further details. In the Eastern Mayan languages, including K'iche', the suffix appears with instrument or locative phrases except in some frozen forms. The Tzeltalan languages extend the applicative to dative, benefactive, malefactive and patient possessors, and maintain instruments in some frozen constructions. I use the Function Parameter to describe this dimension of variation:

The function parameter — the Mayan applicative may or may not appear with some or all of the following functions: dative, benefactive, malefactive, addressee, patient possessors, instrument, locative and circumstance phrases.

Vázquez Alvarez (2002: 313) provides the following examples for Chol:

- (4) a. Dative
 Mi k-choñ-b-eñ-ety ixim
 IMPFV A1-sell-APL-SUF-B2 corn
 'I sell you the corn'
- b. Benefactive
 mi k-mel-b-eñ-ety waj
 IMPFV A1-make-APL-SUF-B2 tortilla
 'I make you tortillas'
- c. Malefactive
 mi k-muk-b-eñ-ety waj
 IMPFV A1-hide-APL-SUF-B2 tortilla
 'I hide the tortillas from you'
- d. Addressee
 mi k-su'-b-eñ-ety ty'añ
 IMPFV A1-tell-APL-SUF-B2 word
 'I tell you the advice'
- e. Patient possessor
 tyi k-ts'äk-ä-b-ety aw-alo'bil
 PERFV A1-cure-VTT-APL-B2 A2-son
 'I cured your son (for you)'
 (Vázquez Alvarez 2002: 315)

I summarize the functional dimension of the *-b'e* applicative for selected languages in (5).

(5) Functions of the *-b'e* applicative in selected Mayan languages⁴

Chontal	Chol	Tzotzil	Tzeltal	K'iche'	Tzutujil
addressee	addressee	addressee	addressee	(addressee)	(addressee)
dative	dative	dative	dative	instrument	(dative)
benefactive	benefactive	benefactive	benefactive	locative	instrument

malefactive	malefactive	malefactive	malefactive
	possessor	possessor	possessor
	(instrument)	(instrument)	(instrument)
			locative

The observation of lexical restrictions introduces a second parameter governing the Mayan applicative. In some languages, the *-b'e* applicative only occurs with one or two specific verbs in a given function. In the Tzeltalan languages, where the applicative is widely used, some verbs do not occur with the applicative. I define this parameter as:

The Lexical Parameter — the Mayan applicative may be subject to positive and negative lexical restrictions.

Dayley (1981: 59) and Garcia Matzar (1998: 114) note that the applicative suffix serves a recipient function on one Tzutujil verb and an addressee role on one other verb:

- (6) Tz'utujil
- x-in-ru-k'ayi-b'e-ej
CMP-B1-A3-sell-APL-TV
'S/he sold it to me'
(Garcia Matzar 1998: 114)
 - x-in-ru-tzijo-b'e-ej
CMP-B1-A3-speak-APL-TV
'S/he talked to me'

The applicative suffix serves an addressee function on the K'iche' verb *-ch'aa* ('talk').⁵ Kaufman (1990: 79) provides an example of this verb in a passive context:

- (7) k-Ø-in-b'iin-ib'e-j a-ch'aa-b'e-x-iik
INC-B3-A1-travel-APL-ST A2-talk-APL-PAS-NOM
'I walk (while) talking to you'

Montgomery-Anderson (2005) notes several instances in Chontal where the addition of the applicative to the verb *-ä'* 'give' produces an unexpected meaning:

- (8) Chontal
- k-ä'-bé-n-Ø wäy-ik
A1-give-APL-INC-B3 sleep-SUBJ
'I make him sleep'.
(Montgomery-Anderson 2005: 14)
 - 'u-x-é 'uy-ä'-bé-n-Ø ja'
A3-go-INC A3-give-APL-INC-B3 water
'It's going to rain'

Martin (1994: 125) provides the example of the verb *haqbe* ‘ask’ from Mocho’ (Greater Q’anjob’alan) which is one of the few verbs in the language that preserves an applicative-like suffix.

- (9) Mocho’
 Ø-x-haq-be-qin-qe’
 ASP-A3-ask-APL-B1-PL
 ‘They asked me’
 (Martin 1994: 125)

Vázquez Alvarez (2002: 304–305) states that in Chol the verb *-äk’* (‘give’) is the only ditransitive verb that does not license the applicative suffix. The verb expresses dative participants either directly on the verb or in a prepositional phrase:

- (10) Chol
- a. tyi y-äk’-ä-Ø waj (cha’añ aläl)
 CMP A1-give-SUF-B3 tortilla (PREP boy)
 ‘I gave a tortilla (to the boy)’
 (Vázquez Alvarez 2002: 288)
- b. tyi k-äk’-ety waj
 CMP A1-give-B2 tortilla
 ‘I gave you a tortilla’

This example is particularly interesting as it creates a learnability problem exclusively for Chol. In closely related languages (Chontal, Tzeltal) the cognate verb frequently appears with the applicative. Presumably, children learning Chol could only learn this restriction through negative evidence. Children could acquire the positive exceptions in Mocho’, Tzutujil, and K’iche’ from positive evidence.

There are also significant differences between the languages in the use of prepositions to mark potential applicative arguments:

The Prepositional Parameter — Mayan languages may use prepositional or relational noun phrases to express one or more applicative functions.

K’iche’ employs a combination of the preposition *chi* ‘to, at’ and the relational noun *-e(ch)* ‘relation’ to mark indirect object phrases. The relational noun may be marked for person or surface simply as the preposition *che* (<chi-r-ee ‘to-A3-POSS’). K’iche’ uses this construction to express datives, instruments and locations, as shown in (11). The *chi* phrase provides an alternative to the applicative construction for associating dative, instrumental and locative functions in K’iche’.

(11) K'iche' *che* phrase functions

- a. Dative
 ch-Ø-a-ya' pan he le al sep.
 IMP-B3-A2-give yonder PREP the FAM Sebastiana
 'Give it to Sebastiana.'
- b. Instrument
 ma k-in-kowin ta chi-r-e le: u-q'ab'
 NEG INC-B1-can NEG PREP-A3-POSS the A3-hand
 k-at-chaa'.
 INC-B2-say
 'Say, I cannot do it with her hand.'
- c. Locative
 k'oo k'u xaqol at che le a-q'ab' al wana.
 exist then mud B2 PREP the A2-hand FAM Juana
 'There is some mud on your hand Juana.'

In many Mayan languages (e.g. Q'anjob'al, Mam), the prepositional form is the only means of expressing indirect arguments. Even Tzeltal, which has a productive applicative construction, has a relational noun construction which can be used to express a benefactive argument. Brown (in press) provides the following Tzeltal example.

- (12) Tzeltal
 la y-ak' jilel jun y-u'un te
 CMP A3-give/put remaining_behind book A3-RN PREP
 Xun-e
 Xun-CL
 'He left behind a book for Xun.'
 (Brown in press)⁶

Q'anjob'al uses the preposition *b'ay* for recipients, benefactives, addressees and locatives, and the relational noun *-etoq* for instruments. The preposition *b'ay* cannot be used with first or second person recipients, benefactives, etc. Instead, the preposition is omitted and first and second person indirect objects appear as either secondary objects (13b) or object possessors (13c). K'iche' does not have this constraint, but K'iche' has a third person pronoun which Q'anjob'al does not have.

(13) Q'anjob'al person restriction in *b'ay* phrase

- a. Aq' xim loj b'ay naq/ix.
 give CL food PREP CL/CL
 'Give him/her the food'
- b. Aq' xim loj ayin.
 give CL food me
 'Give me the food'

- c. hoq-Ø y-aq' hin-lob'ej
 POT-B3 A3-give A1-food
 'S/he will give my food.'
 (Pedro Mateo p.c.)

I list the Mayan prepositions and relational nouns associated with applicative functions in (14). This list is conservative in that it only lists the functions I have been able to verify from the literature. It is possible that these prepositions serve other functions as well.

(14) Applicative prepositions/relational nouns in Mayan languages

	Chontal	Chol	Tzeltal	Q'anjob'al	K'iche'
Preposition	<i>ta/ti</i>	<i>ti</i>	<i>-u'un</i>	<i>b'ay</i>	<i>chi</i>
Role	Benefactive Source Locative	Instrument	Benefactive	Recipient Benefactive Locative Addressee	Recipient Instrument Locative Addressee
Preposition	<i>t'ok</i>	<i>cha'añ</i>	<i>ta</i>	<i>-etoq</i>	<i>pa</i>
Role	Instrument	Recipient	Locative Instrument?	Instrument	Locative
Preposition				<i>-uj</i>	<i>-ee(ch)</i>
Role				Benefactive	Theme

The Mayan languages also have the option of expressing a variety of indirect objects as the possessor of the direct object. This construction introduces a fourth parameter:

The possessor parameter — Mayan languages may express an indirect argument as a possessor of the direct object.

The difference between the possessed object constructions and the prepositional phrase constructions is not as great in Mayan languages as it is in English since most prepositional phrases in Mayan languages are based on relational nouns inflected for possession. The Mayan prepositional phrase, or more properly, relational noun phrase (Kaufman 1990) appears to be the basis for possessor ascension in the Tzeltalan languages (cf. [12]). Examples of K'iche' possessive constructions are shown in (15).

- (15) a. Dative possessor
 k-Ø-a-ya' jun nu-komida k-at-chaa'
 INC-B3-A2-give one A1-food INC-B2-say
 'Give me food say.' (lit. 'Give my food say.')
- b. Benefactive possessor
 jachin k-Ø-a-b'an-ow lee a-wa k-at-chaa'
 who INC-B3-A2-do-ANT the A2-food INC-B2-say

chi-r-ee chaa'
 to-A3-POSS say
 'who makes your food ask him say.'

c. Malefactive possessor

we x-Ø-a-b'an-a lee nu-kem k-at-in-ch'ay-o
 if COMP-B3-A2-do-ST the A1-weaving INC-B2-A1-hit-ST
 'If you do my weaving I will hit you.'

Montgomery-Anderson (2005) notes a potential ambiguity exists in most cases where an object possessor is used in applicative constructions. The applicative verb could cross-reference an argument in its role as either possessor or the indirect argument. He suggests it is simpler to assume the applicative verb in such cases cross-references the indirect argument (which is then deleted under identity with the possessor). He provides a Chontal example of a possessed object that does not trigger the applicative.

(16) Chontal

k-utz'-ä-n-Ø n-ay-utz'-u, nich ta
 A1-smell-DRV-INC-B3 ART-A2-scent-POS flower PREP
 ja'

water

'I smell your scent, flower of the water'.

(Isidro Po: 12)

(Montgomery-Anderson 2005: 12)

Even Chontal verbs that normally take the applicative will not use the construction if the context does not identify an indirect role.

(17) Chontal

mach k-o-Ø k-äl-é'-Ø n-a-k'ába'
 NEG A1-want-B3 A1-say-INC-B3 ART-A2-name
 'I don't want to say your name'.

(Montgomery-Anderson 2005: 12)

Chol, unlike Chontal, allows the possessor to occur as the subject of a passivized verb.

(18) Chol

tyi choñ-b-eñ-tyi-y-oñ k-chityam (tyi aj-wañ)
 PERFV sell-APL-SUF-PAS-EPN-B1 A1-pig (PREP AGT-John)
 'My pig was sold (by John)'.

(Vázquez Alvarez 2002: 293)

The possessor provides another means of expressing indirect arguments in the Mayan languages, but there are significant differences in the constraints on its use. In Chol and Tzotzil the possessor appears as the

primary object, while the possessor must co-refer to the primary object in Chontal. I list the indirect arguments expressed as possessors in (19).

(19) Indirect arguments expressed as possessors in Mayan languages

	Chontal	Chol	Tzotzil	Q'anjob'al	K'iche'
Argument	Recipient	Recipient	Recipient	Recipient	Recipient
	Benefactive	Benefactive	Benefactive	Benefactive	Benefactive
	Malefactive	Malefactive	Malefactive	Malefactive	Malefactive

These examples suggest that animacy and/or person constrains indirect object marking in the Mayan languages. The Cholan languages that restrict the applicative to dative, benefactive and addressee roles have imposed an animacy restriction on the applicative. We find animacy constraints in other aspects of the Mayan applicative as well. The Chol example with the verb *-äk* 'give' (10) uses a preposition with a third person and marks the second person on the verb. If Montgomery-Anderson (2005) is correct in asserting a connection object possessors and indirect objects there would be further support for an animacy parameter.

2.3. *Mayan applicative parameters*

A comparison of the applicative construction across the Mayan languages reveals considerable variation in its form and function (Aissen 1983; Dayley 1981; Mora-Marín 2003). The construction promotes a variety of semantic roles and alternates with prepositional and object possessor constructions.⁷ For the rest of this article, I will assume that these options define the syntactic parameters available to children acquiring three-place predicates in Mayan languages. For convenience, I list these parameters in (20).

- (20) Mayan applicative parameters
- i. The function parameter — the Mayan applicative may or may not appear with some or all of the following functions: recipient, benefactive, malefactive, addressee, patient possessors, instrument, locative and circumstance phrases.
 - ii. The lexical parameter — the Mayan applicative may be subject to positive and negative lexical restrictions.
 - iii. The prepositional parameter — Mayan languages may use a prepositional phrase to express one or more applicative functions.
 - iv. The possessor parameter — Mayan languages may express an indirect argument as a possessor of the direct object.

The comparison of applicative constructions across the Mayan languages highlights the components with which children must contend.

The cross-referencing system on Mayan verbs sets the stage for the acquisition problem in that Set B (absolute) affixes can cross-reference either the direct or the indirect object, but not both. The applicative allows indirect cross-referencing to take place, but does not decide the syntactic fate of the former direct object. Mayan languages that lack an applicative (Q'anjob'al and Mam) use a prepositional phrase or possessor to express indirect objects, creating the problem of which preposition or relational noun to use and when to use a possessive construction instead. The Mayan languages that have an applicative place functional and lexical constraints on its use. The applicative appears to be a vital communicative function in Mayan languages despite these complications. Huastec and Yucatec are two Mayan languages that lost the original applicative suffix and independently innovated a replacement.

The list of applicative parameters introduces the full scope of the acquisition problem. In the absence of a comparative perspective it would be easy to focus on the applicative from the perspective of a single language. Mayan children must determine when to extend Set B cross-referencing to indirect objects as well as the preposition or possessive constructions that express indirect objects in the absence of Set B cross-referencing. Without an understanding of the cross-referencing system or prepositions Mayan children might produce something like the Chol construction with indirect object cross-referencing on the verb (10b). Each of the Mayan applicative parameters I described provides the basis for a potential over- or underextension. In the remainder of my article I will examine how children learning K'iche' and Tzeltal acquire each of these components and the degree to which they succeed in restricting the parameters governing the applicative in their language.

3. Applicative constructions in the speech of Mayan children

I have had the privilege of collaborating over the past four years with three fellow Mayanists interested in documenting the acquisition of Mayan languages. We are comparing the longitudinal acquisition data I collected for K'iche' with data that Dr. Penelope Brown (Max Planck Institute) collected for Tzeltal, data that Dr. Lourdes de León (CIESAS-Sureste) collected for Tzotzil and data that Dr. Barbara Pfeiler (U. Autónoma de Yucatán) collected for Yucatec. This collaboration led to the development of a comparative method for language acquisition research. Obviously, the classical form of the comparative method cannot be applied to acquisition data to reconstruct a historical ancestor. However, we are discovering that the comparison of acquisition data across

genetically related languages yields insights into the acquisition process that cannot be achieved with current crosslinguistic methods. We are developing an extension of the comparative method directed specifically to the analysis of acquisition data.

The comparison of applicative constructions across the Mayan languages enriches our understanding of the factors that constrain the expression of indirect objects. At the same time the comparison sets the conditions for a satisfactory investigation of how Mayan children acquire these constructions. The investigation of applicative acquisition within a single Mayan language would inevitably neglect many factors that constrain the construction in other languages. The use of the applicative suffix on the verb *-ak'* in Tzeltal and the prohibition on its use with the cognate verb in Chol is a striking example of such differences. One methodological advantage of the comparative method is that it brings such differences to light, and thereby sets the goals for documenting their acquisition. Ideally, we would have acquisition data on all of the parameters that govern Mayan applicatives. Regretfully, we lack acquisition data from most Mayan languages, and what little data we have do not address all of the parameters I described above. Penelope Brown has graciously shared her data on the acquisition of Tzeltal with me which I will compare with my own data on the acquisition of K'iche'.

Between 1978 and 1980 I recorded longitudinal samples of three children learning K'iche' (Pye 1991). I recorded one hour of conversation with each of the children approximately every two weeks. For the purposes of this study I grouped the samples into four sets on the basis of the children's chronological age and MLU.⁷ I provide an overview of these samples in (21).

- (21) Ages, MLUs and number of utterances for the four K'iche' language samples.

		Age Groups			
Child	Measure	2;0	2;6	3;0	3;6
Al Tiyaan	Age	2;1	2;7	2;10	
	MLU	1.3	2.1	2.8	
	No. of Utts.	1811	844	1026	
Al Chaay	Age		2;9	3;0	3;6
	MLU		1.6	2.7	3.5
	No. of Utts.		945	2356	1770
A Carlos	Age		3;1	3;4	3;8
	MLU		1.8	2.8	3.3
	No. of Utts.		735	3032	1508

3.1. *The acquisition of applicative constructions*

The Mayan languages provide three distinct options for the expression of indirect objects. They can appear as pronominal verb affixes with the addition of the applicative suffix, they can appear in prepositional phrases, and they can take the form of direct object possessors. Within any specific language, Mayan children must learn which options are available for any given semantic function. Crain and Pietroski (2002) conjecture that children may choose an option available in other languages for any given construction. If they are correct, we should find Mayan children exercising all three options in their applicative production. I provide examples of applicative constructions for K'iche' children in (22) and for Tzeltal children in (23).⁸

(22) K'iche' children's applicative

- a. Al Chaay (2;9)
 pej.
 = *k-Ø-*inw-*etz'a-b'e-j.
 INC-B3-A1-play-APL-VTD
 'I'm going to play it.'
- b. Al Tiyaan (3;0)
 in chi k'ut nch'ab'ej cha.
 = in chi k'ut *k-0-in-ch'aw-b'e-j cha'.
 A1 too EMP INC-B3-A1-talk-APL-VTD say
 'Me too, I will talk, they say.'
- c. Carlos (3;4)
 ut 'eb'ej te'l.
 = k'ut *k-Ø-*aw-etz'a-b'e-j *altel.
 EMP INC-B3-A2-play-APL-VTD FAM Tel
 'Play it Tel!'

(23) Tzeltal children's applicative

- a. Lus (2;0)
 pojben alus
 = *ya *s-poj-be-n alus
 INC A3-steal-APL-B1 alus
 'Alux steals it from me.'
- b. Xan (2;2)
 kak'be
 = *ya k-ak'-be-Ø
 INC A1-give-APL-B3
 'I'll give it to him.'
- c. Mik (2;3)
 k'ejbe Pontz

= *ya *j-k'ej-be-Ø Pontz
 INC A1-put_away-APL-B3 Pontz
 'I'll put it away for Pontz.'

The applicative verbs in K'iche' and Tzeltal have similar structures, and yet there are obvious differences in the K'iche' and Tzeltal children's use of applicatives. The most obvious difference is in the ages of the children; the Tzeltal children begin using verbs with applicative suffixes almost a full year before the K'iche' children. A second difference occurs in the verbs the children used with the applicative. The K'iche' children confined their use of the applicative suffix to the verbs *-etz'a* 'play' and *-ch'aw* 'talk'. The Tzeltal children use the applicative with a wider array of verbs. Verbs with meanings like the Tzeltal verbs *-ak'* 'give/put' and *-poj* 'steal' also occur much more frequently in K'iche' and Tzeltal conversations than the K'iche' verbs *-etz'a* and *-ch'aw* so Tzeltal children have many more occasions in which they can use applicatives than K'iche' children. The tables in (24) and (25) list the number of verb types/tokens the children produced with the applicative suffix as well as the semantic roles they expressed.

(24) K'iche' children's use of the applicative suffix *-b'e* (types/tokens)

Al Tiyaan			3;0		
			instrument	1	
			addressee	1	
Al Chaay	2;6		3;0		
	Instrument	1	addressee	1	
			locative	2/3	
A Carlos			3;0		
			instrument	1	
			addressee	1	

(25) Tzeltal children's use of the applicative suffix *-b'e* (derived from Brown, in press)

Lus 2;0		2;6		3;0		3;6	
dative	1/3	dative	1/6	dative	1/13	dative	1/13
benefactive	4	benefactive	4	benefactive	4	benefactive	4
malefactive	1	malefactive	1	malefactive	4	malefactive	6
addressee	1	addressee	1				
Xan 2;2		2;6		3;0		3;6	
dative	2/2	dative	1/9	dative	1/9	dative	1/8
benefactive	8	benefactive	6	benefactive	5	benefactive	7
malefactive	8	malefactive	1	malefactive	9	malefactive	4
locative	1	addressee	1				

Mik 2;3		2;6		3;0		3;6	
dative	1/2			dative	1/28	dative	1/4
benefactive	2	benefactive	4	benefactive	9	benefactive	1
		malefactive	4	malefactive	4	malefactive	1
		addressee	1				

These tables underline the difference in the use of the applicative suffix between children learning K'iche' and Tzeltal. Although there is some overlap in the semantic functions expressed by the applicative suffix in these languages the difference in productivity reflects the difference in semantic roles expressed by the applicative. The addressee role, for example, is marked with the applicative in both languages, but is expressed infrequently in both languages. The Tzeltal children make heavy use of the applicative to express dative and benefactive semantic roles like their parents. Brown (in press) says that the Tzeltal children occasionally omit the applicative suffix in obligatory contexts, but she does not record how frequently such omissions occur. Data in Brown (1997) suggest Xan only used the applicative suffix in 25% (1/4) of its obligatory contexts at 2;2. The limited use of the suffix at two years of age suggests that it is not fully productive until the children are at least two and a half years old. The K'iche' children have evidently learned that the applicative suffix does not extend to these semantic roles in their language. The K'iche' children cannot acquire this constraint on the basis of positive evidence since it appears as a systematic gap in their input. Furthermore, we have the Tzeltal data to show that the applicative's use with dative and benefactive arguments is perfectly acceptable. No abstract grammatical principle restricts the use of the applicative suffix in K'iche'; the restriction is solely a matter of usage.

K'iche' also possesses the nominalizing suffix *-b'al*. The K'iche' affix derives a noun that refers to the instrument or location typically associated with an action. Common examples would be *mes-b'al* (sweep-INSTR) 'broom' and *k'ayi-b'al* (buy-INSTR) 'market'. These meanings are directly related to the uses of the suffix *-b'e* shown above in (24). Other Mayan languages which lack the applicative suffix such as Mam and Q'anjob'al have a nominalizing suffix cognate with *-b'al*. The *-b'al* suffix provides another source of evidence for possible instrument advancement via the *-b'e* suffix. The children frequently produced examples of instrument nouns from the first period as shown in (26). Thus, they are familiar with the concept of adding an instrumental suffix to verbs. Interestingly, the children display an expansion of verb types appearing with the instrumental suffix at 3;0, the same period in which they begin using the suffix *-b'e*.

Their use of the *-b'al* suffix to derive locative nouns appears to follow their use of the same suffix to derive instrumental nouns. I was surprised by this result since I was under the impression that locative nouns were frequent occurrences in the input, e.g., *k'oolib'al* 'place', *k'ayib'al* 'market', *warab'al* 'bedroom', and *k'isb'al* 'last'. To some extent my division of the children's recordings exaggerates the time between use of instrumental and locative nouns for Al Chaay. Al Chaay used three locative nouns in the samples between 2;6 and 3;0 when she was two years, ten months old and had an MLU of 2.1. Nevertheless, the data suggest that K'iche' children begin producing locative nouns some time after their first productions of instrumental nouns even though both derivations attach the same form to the verb.

(26) K'iche' children's use of the instrumental suffix *-b'al* (types/
tokens).

Al Tiyaan	2;0	2;6	3;0	
	instrument 2/8	instrument 2/2	instrument 2/3	
Al Chaay		2;6	3;0	3;6
		instrument 2/8	instrument 3/9	instrument 2/3
			locative 3/6	locative 1
Carlos		2;6	3;0	3;6
		instrument 1/2	instrument 4/17	instrument 1/4
				locative 2/2

We have seen that Mayan languages provide their speakers with other means of encoding indirect objects. The examples in (27) illustrate K'iche' children's use of the preposition *chi* to express dative arguments.

(27) K'iche' children's oblique phrase

- a. Al Tiyaan (2;2)

m ya qeh.
= m *ch-Ø-*a-ya' *chi-q-ee.
m IMP-B3-A2-give to-A4-POSS
'Give it to us.'
- b. Al Chaay (2;9)

we chij.
= *a *k-Ø-*a-*ya' *chi-w-e *le *jun chij.
Qy/n INC-B3-A2-give to-A1-POSS the a sheep
'Are you going to give me this sheep?'
- c. Carlos (3;4)

aya chuwe le jun wuj chaa'.
= *k-Ø-a-ya' chi-w-e le jun wuj cha'.
INCOMP-B3-A2 to-A1-POSS the one book say
'Give the book to me they say.'

These examples present a uniquely “K’iche’” pattern of indirect object expression that contrasts with the applicative construction in Tzeltal. At first K’iche’ children omit the preposition in their productions illustrated by the utterances of Al Tiyaan and Al Chaay. Nevertheless, the indirect object appears after the verb. Al Chaay’s and Carlos’ utterances are noteworthy in that the indirect object precedes the direct object. These examples include the verb *-ya’* ‘give/put’. This verb occurs much more frequently than any of the verbs in (22) and provides K’iche’ children more frequent opportunities to use the prepositional construction to express indirect objects. The table in (28) provides a complete account of preposition production for K’iche’. This is the only data I have on the development of prepositional phrases in Mayan languages. It shows that K’iche’ children do not completely avoid expressing dative and benefactive arguments, but that they make use of the proper K’iche’ constructions to do so. K’iche’ children evidently have some reason for expressing dative and benefactive arguments from an early age. They do so by means of a phrase headed by the preposition *chi* rather than by means of the applicative suffix.

(28) K’iche’ indirect object utterances (types/tokens).

Al Tiyaan	2;0		2;6		3;0		3;6	
	dative	1/1	dative	1/1	dative	1/1		
			benefactive	1/1	benefactive	1/1		
			instrument	1/1	instrument	1/1		
			locative	1/1	locative	3/3		
					comitative	1/1		
Al Chaay			2;6		3;0		3;6	
			dative	2/13	dative	1/2	dative	1/5
			locative	1/2	locative	2/3	locative	2/2
					benefactive	1/2	benefactive	1/14
							possessor	1/2
							addressee	1/1
							source	1/1
Carlos					3;0		3;6	
					dative	1/1	dative	1/1
					instrument	1/1	instrument	1/3
							malefactive	3/5
							locative	2/6

K’iche’ children have one other means of expressing indirect objects — the possessed object construction. I provide examples of the children’s possessed object utterances in (29).

- (29) K'iche' children's possessed object
- a. Al Tiyaan (2;7)
 qana jun qe: he:?
 = *k-Ø-qa-b'an-a jun q-e he:?
 INC-B3-A4-make-VR one A4-POSS EXC
 'Should we make one for ourselves?'
- b. Al Chaay (2;6)
 nan, loq' ech wa?
 = na:n *k-Ø-*qa-loq' *q-e:-ch wa.
 mother INC-B3-A4-buy A4-POSS-TERM EXC.
 'Mother, can we buy one of our own?'
- c. Carlos (3;0)
 cha jun nolen.
 = ch-Ø-a-*ya' jun nu-len.
 IMP-B3-A2-give one A1-penny.
 'Give me a penny.'

These examples show that K'iche' children also make use of possessed object constructions to express indirect objects. They occur with verbs that are frequent in daily conversation. The table in (30) presents the only Mayan data I have on the development of possessed objects. The data are inclusive in the sense that (30) includes cases where the children omitted the possessive affix in an obligatory context. It provides an outside estimate of the contexts for indirect object expression in K'iche' children's speech. If we add these results to those in (28), we find that K'iche' children express dative and benefactive roles at least as frequently as the Tzeltal children (allowing for differences in the number of hours each child was recorded). The K'iche' children are simply distributing their expression of indirect objects across a different set of morphosyntactic constructions.

(30) K'iche' possessed object utterances (types/tokens)

Al Tiyaan	2;0	2;6	3;0	3;6
	addressee	1/1		
	dative	1/2	dative	1/1
	benefactive	4/4	benefactive	5/9
	malefactive	1/1	malefactive	2/2
Al Chaay	2;6	3;0	3;6	
	benefactive	2/6	benefactive	5/11
	malefactive	1/1	malefactive	1/1
			dative	1/5
			comitative	1/2
			addressee	2/2

Carlos	3;0	3;6
	dative 1/2	dative 1/9
	malefactive 2/2	malefactive 3/19
		benefactive 11/19
		addressee 1/1

3.2. Errors

The three types of Mayan applicative constructions provide the basis for different types of errors. Consider errors of omission. Children acquiring languages with the applicative suffix might at first omit the suffix in its obligatory contexts. Brown (In press) mentions that the children learning Tzeltal occasionally omit the applicative suffix. Brown (1997) provides the following example (31).

- (31) Tzeltal applicative omission
 Xan (2;2)
 ti'at w-akan
 = *la *s-ti'-*be-at a'w-akan
 COMP A3-bite-APL-B2 A2-foot
 'It bit your foot.'

This example is particularly interesting since Xan managed to produce the second person absolutive pronominal suffix with the verb while omitting the intervening applicative suffix. The omission of the applicative suffix changes the grammatical status of the person suffix from indirect object (a possessor in this example) to direct object (i.e. "bit you" instead of "bit your"). The context and other data on the development of object cross-referencing on verbs (Pye 1990) suggest Xan's error is one of omission rather than systematic confusion.

Interestingly, children's omission of prepositions in K'iche' produces a result that is similar to the previous Tzeltal example. In the following example, Al Chaay omits the preposition *chi*. This omission has the surface effect of advancing the indirect object to direct object status, but once again other evidence suggests this is a case of omission rather than confusion. The children omit the preposition over a long period. They only produced the preposition *chi* in a third to a half of its obligatory contexts at three years of age.

- (32) K'iche' preposition omission
 Al Chaay (2;6)
 paj we?

= *a *k-Ø-*a-sipa-j *chi-w-e:
 Q^{y/n} INC-B3-A2-gift-DTV PREP-A1-RN
 ‘Will you give it to me?’

Omission errors also occur with possessor marking. I provide an example of object possessor omission in (33). The omissions in this context do not change the syntactic role of the indirect object. The K’iche’ children do slightly better at producing possessor marking than prepositions, but they only produce the object possessors between seventy and ninety percent of the time at three years of age.

- (33) K’iche’ possessor omission
 Al Tiyaan (2;8)
 no *chaya’ len.*
 (= no *ch-Ø-a-ya’ *nu-len.*)
 no IMP-B3-A2-give A1-penny
 ‘no, give *my penny’

Errors of omission are by far the most frequent type of error that Mayan children commit with the applicative construction. The data for Xan (Brown 1997) suggest that Tzeltal children might have an early tendency to omit the applicative suffix in benefactive contexts, but this observation awaits further analysis. Brown (in press) states that she has not found any inappropriate uses of the applicative suffix in the Tzeltal children’s productions. The K’iche’ data presents more opportunities for the children to extend the applicative suffix to inappropriate contexts, but I have not found any examples that I could be certain were errors. The example in (34) appears strange to me, but it is not one that I can categorically rule out in K’iche’. The K’iche’ verb *ya’* has both “give” and “put” meanings as does the Tzeltal verb *ak’*. This verb provides a prime context for confusion between dative and locative uses of the applicative suffix, but I have no data that suggest K’iche’ children extend the applicative to dative arguments for this verb or any other.

- (34) Possible applicative overextension in K’iche’
 Al Chaay (3;3.14)
b’ej ub’i le kach’yaaq.
 = *k-Ø-*ki-ya’-b’e-j *wi le k-atzyaaq.
 INC-B3-A6-give/put-APL-DTV PLOC the A6-clothes
 ‘They put their clothes there.’

I found one example in which A Carlos introduced an extraneous relational noun (35). The verb *-tzukuuuj* ‘look for’ is a regular dyadic verb. I would expect this verb to appear with a direct object, whereas A Carlos produced it with an oblique argument phrase headed by the relational

noun *che*. Although my gloss for this sentence also contains the relational noun, my sense of the language, and the example sentences in Ajpacaja Tum et al. (1996) suggest that the verb should appear without the relational noun. One of my students, Ivonne Heinze, has collected similar sentences from children learning Kaqchikel (Heinze 2004). Once again, the verb's morphology suggests that Carlos was well aware of the transitive nature of the verb. He produced an ergative cross-reference prefix to mark the subject, and a suffix which only appears on derived transitive verbs. Cases of relational noun omission far outnumbered the cases of extraneous relational noun production.

- (35) Inappropriate indirect object phrase
 A Carlos (3;8)
 kintzukuj che juntij.
 (= k-Ø-in-tzuku-j !che juntij.)
 INC-B3-A1-look_for-DTV piece
 'I will look for a piece.'

The comparative approach suggests one other potential constraint on applicative constructions in K'iche'. Recall that Q'anjob'al limits the preposition *b'ay* to third person indirect objects. The Q'anjob'alan constraint suggests that children learning K'iche' might also limit their use of the *chi* construction to third person indirect objects. To test this potential restriction I examined the K'iche' children's *chi* constructions including those where the children had omitted the preposition (36).⁹ The data suggest the K'iche' children become more proficient over time at supplying the preposition rather than constraining preposition use by person.

- (36) K'iche' preposition use by person (with/without *chi*)
- | | | | |
|-----------|------|-----|------|
| Al Tiyaan | 2;0 | 2;6 | 3;0 |
| Person | | | |
| first | 0/1 | 3/0 | 1/0 |
| third | 0/1 | 1/0 | 0/2 |
| Al Chaay | 2;6 | 3;0 | 3;6 |
| Person | | | |
| first | 2/11 | 0/1 | 17/0 |
| second | | 0/1 | |
| third | | 1/2 | 3/0 |
| Carlos | | 3;0 | 3;6 |
| Person | | | |
| first | | 1/0 | |
| second | | | 1/0 |
| third | | 0/1 | 14/0 |

4. Summary and conclusions

A survey of three-place predicate constructions in the Mayan languages reveals a history of tremendous change in syntactic constraints and semantic functions. Proto-Mayan once contained the applicative suffix **-b'e* that promoted datives, benefactives, possessors, instruments, locatives and other oblique arguments to primary objects. The former direct object was probably demoted to an oblique argument. The use of the **-b'e* suffix was optional; indirect arguments could also surface as relational noun phrases headed by the preposition **chi*, or as possessors of the direct object. The critical elements in the Proto-Mayan construction were:

1. A unified expression of dative, benefactive, possessor, instrumental and locative functions.
2. An oblique phrase that requires possession of a relational noun.
3. An applicative verb suffix that promoted indirect objects to primary objects.
4. The use of object possessors as an alternative means of expressing indirect arguments.

The current Mayan languages show that each piece of the Proto-Mayan applicative complex is susceptible to change. The Yucatecan languages and Huastec have lost the original applicative suffix, but innovated a replacement. Q'anjob'al and Popti' have lost the applicative suffix, but Popti' pressed one of its many antipassive affixes into service as a replacement. Chontal lost the Proto-Mayan relational noun construction for expressing indirect objects making the applicative obligatory (Bradley Anderson, p.c.). Such cycles of loss and replacement suggest that the applicative construction is a central feature of Mayan language structure — one that cannot be done away with for long.

At first, K'iche' and Tzeltal children can only produce one or two parts of three-place predicate constructions. The children only begin producing the verb, direct and indirect objects in the same sentence around three years of age. K'iche' children require some time before they can reliably produce the prepositions that head oblique phrases. Tzeltal children require some time before they reliably produce the applicative suffix on the verb. The dative, benefactive, and malefactive functions are the most frequent uses of these oblique phrases during the earliest periods of language development. Thus, children's productions provide a source for constructions that advance dative and benefactive functions to direct arguments on a superficial level.

The applicative suffix is a relatively late acquisition in K'iche', but produced earlier in Tzeltal. K'iche' children first used the applicative

productively around three years of age even though they heard many other speakers using the suffix in earlier sessions. The children began using the nominalizing suffix *-b'al* on verbs slightly earlier which suggests that K'iche' children have the ability to use derivational suffixes on verbs before they began using the applicative. The applicative appears later than passive and antipassive suffixes in K'iche' (Pye and Quixtan Poz 1988). Thanks to the comparative method we see that its acquisition is relatively late in another sense. Children acquiring Tzeltal begin using the applicative suffix at an earlier age than K'iche' children to express a wider array of semantic roles. This difference is clearly due to the difference in input for K'iche' and Tzeltal. Whether this difference can be attributed to simple frequency differences or to the semantic roles expressed by the applicative in the two languages must await further analysis.

K'iche' speakers have the option of using relational noun phrases instead of the applicative suffix. In this respect, the applicative construction appears to be vulnerable to loss. The applicative takes a dramatically different developmental course in Tzeltal as Penelope Brown shows (in press). This difference underscores the difficult learnability problem that children learning the applicative in all Mayan languages must address. There is no reason why K'iche' children could not use the applicative in the Tzeltal fashion, while Tzeltal children could just as easily adopt the K'iche' usage.

We have two opposing tendencies working on applicative phrases in the Mayan languages. On one hand, there is the promotion of oblique arguments to direct argument status through omission of the preposition that heads the oblique phrase. Opposing this advancement is the structural requirement that Mayan verbs register all changes in argument status through the addition of an appropriate derivational suffix on the verb. We find evidence of these forces in the comparative structures of the adult Mayan languages as well as in children's attempts to put all the pieces of the applicative puzzle together.

The comparative method reveals precise points of potential change that current acquisition theories cannot equal. A narrow focus on the acquisition of the applicative construction in K'iche' produces the mistaken impression that perfect acquisition of the adult form is inevitable. From the K'iche' perspective, extension of the applicative construction to dative arguments is inconceivable. The restriction to instrumental, addressee and locative arguments in K'iche' is simply the way the language works. The comparative method provides new insights into the nature of the learnability problems children face in acquiring language. In the Mayan context, the real learnability issues K'iche' children face is whether the applicative applies to datives and benefactives as well as to instruments and

locatives. With this new perspective, the mystery of acquisition is not how children acquire the K'iche' applicative, but how K'iche' children avoid switching to the Kaqchikel, Q'anjob'alan, or Tzeltalan alternatives. Mayan linguistic history suggests that such an analysis is still a potential option for K'iche' children.

An additional benefit of the comparative method is that it controls in-appropriate crosslinguistic comparison. All too frequently, linguists compare superficial features in different languages to support some theory of the moment. Consider a comparison of applicative constructions in English and K'iche'. English lacks an overt applicative suffix on verbs, but nevertheless promotes indirect objects to primary object status for dative, benefactive and addressee semantic roles. The K'iche' applicative is reserved for instrument, addressee and locative semantic roles rather than datives and benefactives. Since the semantic roles determine which verbs take the applicative, the lexical base for the construction is dramatically different in the two languages. The former direct object is demoted to an oblique phrase in K'iche' and to a secondary object in English. Furthermore, English marks dative arguments with the preposition *to* and benefactive arguments with the preposition *for*. K'iche' uses the preposition *chi* with dative, benefactive, instrument and locative arguments. Children learning English make a distinction between the dative and benefactive constructions very early (Billington 2002) while children learning K'iche' and Tzeltal treat these arguments alike. The crosslinguistic comparison of applicatives in English and K'iche' is at best uninformative in stark contrast to what can be learned from comparisons between Mayan languages. The comparative method guards against superficial comparison providing a scientific basis for linguistic research.

In this article I have focused on applying the comparative method to acquisition data on Mayan applicatives. The Mayan data have obvious implications for acquisition theory. Contra Crain and Pietroski (2002) there is no evidence that Mayan children apply other parametric choices to their acquisition of K'iche' and Tzeltal. We have no evidence that K'iche' children extend the applicative along Tzeltalan lines or that Tzeltalan children extend prepositions in the K'iche' manner. Their errors fall fully within the architecture of the language the children are acquiring and do not support the Continuity hypothesis. We will not be in a position to interpret children's productions properly until more researchers apply the comparative method to acquisition data.

Pinker (1989) hypothesized that children rely upon narrow semantic classes of verbs to acquire constraints on English applicatives¹⁰ and speculated that these semantic classes are similar across languages (Pinker 1989: 96–97). The comparative Mayan data refute Pinker's hypothesis

by showing that closely related languages vary considerably in their application of a particular derivational process. The use of the applicative suffix is not constrained by the narrow semantics of individual verbs, but rather the patterns of usage within a given society. K'iche' speakers could decide at any time to extend the applicative to dative and/or benefactive arguments while Tzeltal speakers could restrict their use of the applicative to instruments and addressees. Dowty (1979) rejected an earlier proposal by Green (1974) that attempted to account for constraints on English applicatives by means of semantic verb classes. Dowty noted that derivational processes often introduce idiosyncratic semantic changes to verbs, which we have observed for Mayan applicatives. Dowty explains the acquisition of applicatives as a lexical process which permits occasional extensions of the construction. The comparative method provides an incomparable tool for assessing the role of narrow semantic verb classes in constraining grammar.

Finally, the Root Infinitive hypothesis (Wexler 1998) cannot explain the omission of applicative verb suffixes that occurs in the case of Tzeltal. The Root Infinitive hypothesis focuses on the omission of tense inflection and predicts that children will sometimes use nonfinite verb forms in place of fully inflected verbs. The Root Infinitive hypothesis does not encompass the omission of applicative suffixes since such omissions result in a verb form that is neither infinitival nor properly inflected. It seems that children acquiring some languages lack very early knowledge of verb inflection. I suggest that the comparative method provides the proper method to assess hypotheses like Wexler's. Rather than evaluating children's use of verb inflection in a piecemeal fashion across languages, the comparative method provides a systematic means of assessing children's morphology.

This article is only a first step to a new method of language acquisition research. At this point the results are mixed due to the lack of acquisition data required to fully implement the method. Nevertheless, I find the results encouraging on two counts. First, the comparative method produces a clear map of the linguistic structures needed for comparison. We at least know what data is required to implement a comparative method for language acquisition research. Second, even these limited results point to a stark contrast between the approaches K'iche' and Tzeltal children take to producing three-place predicates. They exhibit language-specific applicative constructions from the earliest point of data collection.

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Notes

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- Throughout this article, I use the terms *subject*, *direct object*, and *indirect object* to refer to arguments with distinct syntactic realizations in K'iche'. Transitive verbs cross-reference subjects with Set A inflections (ergative) and cross-reference direct objects with Set B inflections (absolutive). I use the terms *dative*, *benefactive*, *instrument*, and *locative* to refer to the semantic functions of indirect objects.
 - K'iche' is the official spelling adopted in Guatemala during the 1980s. The language name was generally spelled Quiché before this change. All K'iche' words are shown in the practical orthography developed by the Proyecto Lingüístico Francisco Marroquín (Kaufman 1976) with a single exception: I use ⟨'⟩ rather than ⟨7⟩ for the glottal stop. The other orthographic symbols have their standard IPA values except: ⟨tz⟩ = /ts/, ⟨ch⟩ = /tʃ/, ⟨b'⟩ = /b/, ⟨tz'⟩ = /ts'/, ⟨ch'⟩ = /tʃ'/, ⟨x⟩ = /ʃ/, ⟨j⟩ = /x/, ⟨ä⟩ = /i/. I use the following abbreviations throughout the article:
- | | | | |
|------|----------------------------|-------|---------------------------------------|
| 1 | first person singular | IMP | imperative |
| 2 | second person singular | INC | incompletive aspect |
| 3 | third person singular | INSTR | instrumental suffix |
| 4 | first person plural | NEG | negation particle |
| A | ergative cross-reference | NOM | nominalization suffix |
| ANT | antipassive suffix | PASS | passive suffix |
| APL | applicative suffix | PLOC | locative focus particle |
| ASP | aspect prefix | POSS | possessive relational noun |
| B | absolutive cross-reference | POT | potential particle |
| CL | classifier | Qy/n | yes/no question particle |
| COMP | completive aspect | ST | status suffix |
| EMP | emphatic particle | T | tense |
| EXC | exclamation particle | V | vowel |
| FAM | familiar particle | VTD | derived transitive verb status suffix |
- I have not presented other parametric differences in Mayan applicatives to save space. Other parameters include whether the indirect object is promoted to a primary object, whether the former direct object is demoted to a secondary or oblique object, and whether the indirect object is further advanced to focus position.
 - Parentheses indicate the function only occurs in highly restricted forms.
 - Mondloch (1981: 292–293) describes several derived transitive verbs that he claims end in /b'e/ but do not have an applicative interpretation. He includes the verbs *ch'aab'e* 'talk to' and *etz'ab'e* 'play something'. As evidence Mondloch provides examples of nominalized forms for both verbs: *ch'aab'e-b'al* 'instrument for talking to' and *etz'ab'e-b'al* 'instrument for playing something'. The nominalized forms for these verbs

in Zunil, where I worked, were *ch'aa-b'al* 'language' and *etz'a-b'al* 'toy', respectively. Thus, I analyze both verbs as applicative stems.

6. Brown (p.c.) found that some Tzeltal speakers now reject this example while others find it acceptable.
7. I determined the children's MLU by counting all overt morphemes the children produced in a given session and dividing the result by the total number of utterances. Acquisition data suggest that K'iche' children have a productive knowledge of the language's agglutinative morphology even when they do not consistently produce the inflections in obligatory contexts (Pye 1983, 1991, 2001).
8. Each of the children's examples contains a line beginning with an equal sign ('=') to indicate the adult equivalent. The asterisks in the adult equivalent lines indicate morphemes that the children omitted in their productions.
9. The number to the left of the slash shows the number of times the children produced the preposition while the number to the right of the slash shows the number of times the children omitted the preposition.
10. Pinker (1989) uses the terms *to-dative* and *for-dative* to refer to English applicatives.

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