

Null Subjects

Along with missing inflections, researchers have long noted that children acquiring English often produce incomplete sentences, e.g.,

Charlie (2;6)
ah, ___ fell down.
___ need one toy now deda.
yeah, ___ need help.

Linguists began investigating the differences between languages with obligatory subjects like English, and languages with optional subjects like Italian in the 80s. Researchers then tried to account for the differences between subject use by children and adults. These approaches are divided between competence and performance accounts.

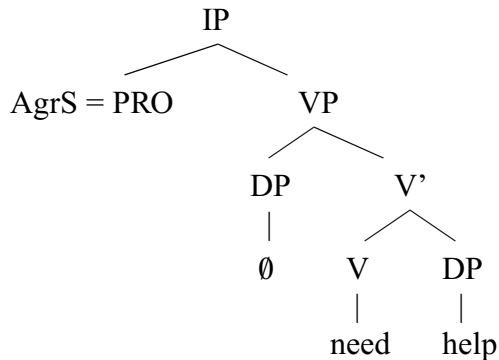
Parameter Setting (Hyams 1986)

In 1981 Chomsky proposed a model of language that distinguished between principles and parameters. Principles, such as X-bar theory, are universals that apply to all languages. The parameters specify the set of options that define the range of variation between languages. Each parameter determines language specific values for a wide range of linguistic features. Children acquire a specific language by setting the values of the parameters that govern language variation.

One example is the head position parameter. Languages are classified as head-first or head-last. By setting the head position parameter, a child can predict the relative positions of:

- i. verb + direct object (the verb's complement)
- ii. (pre)position + complement
- iii. auxiliary + complement
- iv. noun + complement
- v. determiner + complement

One example of a parameter that received early attention was the pro-drop parameter. Hyams (1986) applied the pro-drop parameter to the acquisition of English. Hyams proposed linking this parameter to the form of agreement specified for each language. Languages with 'rich' agreement systems like Italian and Spanish identify the agreement feature with the null pronominal element PRO. PRO is found in English infinitival constructions, e.g., Clyde asked Sandy PRO to paint his garage. PRO functions as a pronoun to indicate the subject of the infinitive, but it only occurs in non-finite contexts, c.f., *Clyde asked Sandy if PRO painted his garage.



By linking PRO to the agreement feature, Hyams predicts:

- i. the optional use of subject pronouns (since PRO provides the reference for null subjects)
- ii. the presence of ‘rich’ agreement (allows ‘recovery’ of the deleted subject reference)
- iii. the absence of auxiliary verbs (auxiliaries create a finite contexts incompatible with PRO)
- iv. post-verbal subjects (the agreement features may move to the verb at either the level of syntax or phonology. Syntactic movement allows the agreement features to license a post-verbal subject. Phonological movement licenses pre-verbal subjects.)
- v. no expletive subjects (e.g., ‘It’s cold’; PRO replaces expletive pronouns)

Hyams proposed that all children begin with the pro-drop setting for this parameter. Children learning English would then optionally omit subject pronouns, not use auxiliary verbs, use post-verbal subjects, and not use expletive pronouns. She predicted that once children notice the use of expletive subjects in English they would ‘reset’ the parameter to the non-pro-drop position.

Assessment

Hyams provides the first detailed parameter-setting model for language acquisition. She chose examples from different children to illustrate her theory rather than systematically analyzing data from a single child. Thus, we cannot assess the observational adequacy of her model.

Hyams’ model has several logical flaws:

- i. English-speaking children do not produce the ‘rich’ agreement inflections that license null subjects.
- ii. English-speaking children do not produce auxiliary verbs with finite verb complements, e.g., *He can goes.
- iii. She does not explain why it takes so long for children to notice expletive subjects (Davis 1989)
It’s time for bed!
Once upon a time, there were three bears

The model is not supported by empirical evidence

- i. Ingham (JCL 1992) reports that one child (Sophie) used subjects in 90% of her sentences at 2;4, but didn’t use expletive pronouns until 2;9 or auxiliaries until 2;7-2;8.
- ii. other children have some auxiliaries during the pro-drop period.
- iii. children omit verbs and objects as well as subjects.
- iv. children omit first and second persons more frequently than third person arguments (Clancy 1993).
- v. children omit subjects of transitive verbs more frequently than subjects of intransitive verbs (Allen & Schroeder 2003; Clancy 2003).
- vi. there are large differences in the rate of subject (and object) omission across languages.

Language	Subject omission	Object omission
English (P. Bloom 1989)	55%	9%
Chinese (Wang et al. 1992)	56%	23%
Korean (Kim 2000)	77%	51%
K’iche’ (Pye 1992)	92%	67%

- vii. children do not omit subjects in questions with a fronted wh-element (Valian 1990).
- viii. children do not omit subjects in subordinate clauses (Valian 1991).

The parameter-setting procedure raises several concerns

- i. Children should apply the **Subset Principle** to avoid learnability problems (Wexler & Manzini 1987). Children begin with the most restrictive setting of a parameter and relax this setting when they find positive evidence. This principle applies to the pro-drop parameter in different ways.
 - a. focusing on expletive subjects, pro-drop languages are a subset of non-pro-drop languages
 - b. focusing on optional subjects, non-pro-drop languages are a subset of pro-drop languages
- ii. Different parameters may interact and create a learnability problem (Davis 1989), e.g.,

Parameter 1: Wh-movement. Languages like English and Hausa have overt wh-movement. Languages like Basque and Japanese do not.

Parameter 2: Bounding. Languages like English restrict the movement of wh-phrases. Languages like Italian are less restrictive.

Do children set the movement parameter before the bounding parameter or vice versa?

if Move P < Bounding P requires negative evidence for English bounding restrictions
 if Bounding P < Move P children lack evidence for bounding without movement

Other Wh-parameters also exist:

Multiple Wh-Parameter:

Bulgarian (Rudin 1988)	Russian (Nina Radkevich, pc)
Koj kakvo kupuva?	Kto kogo kogda gde i s kem videl?
who what buys	who-nom who-acc when where and with who-inst saw
‘Who buys what?’	‘Who saw whom with whom where and when?’

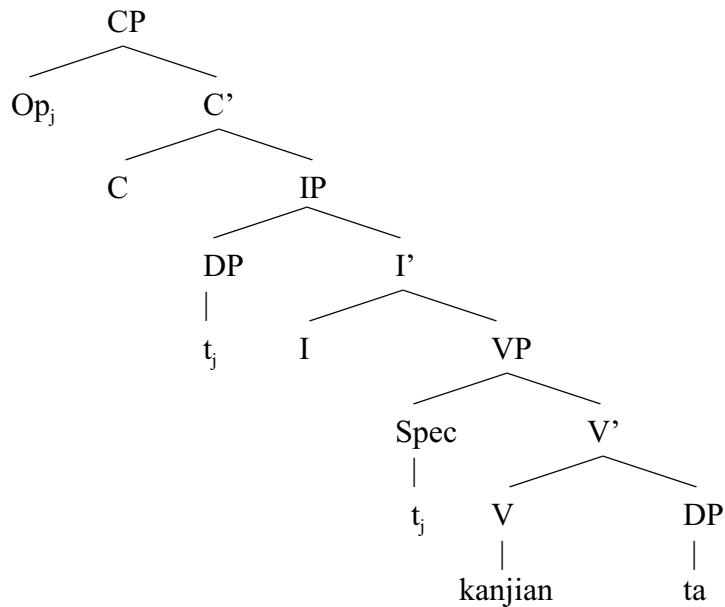
Rudin’s classification (1988: 448):

	Chinese	French	English	Bulgarian
Single wh	LF	LF/syntax	syntax	syntax
Multiple wh	LF	LF	LF/syntax	syntax

Topic-Drop (Hyams 1992)

Children may begin with a topic-drop language like Chinese rather than a pro-drop language like Italian, e.g.,

___ kanjian ta le. (Huang 1984)
 see he Perfective
 ‘He saw him.’



Problems:

1. The hypothesis is not supported by the crosslinguistic differences in the rate of subject and object omission noted earlier.
2. The hypothesis does not account for postverbal subject drop found in children acquiring German (Hamann 1992).

Christoph (3;4.5)

Das muß ___ zusammenbauen
 that must/I ___ put_together
 'I must put that together.'

Elisa (3;1.12)

Ganz viele hab ___ hier
 very many have/I ___ here
 'I have quite a lot here.'

Percentages of different types of null subjects for children acquiring German (Hamann 2002)

Child	preverbal	postverbal	yes-no question	subordinate clause	Wh question
Elisa	58%	17%	17.5%	5.3%	1.4%
Christoph	82.9%	11.4%	5.7%	0	0

Root Infinitives

Wexler (1994, 1996, 1998) connected the absence of subjects to children's use of root infinitives. Wexler's Agreement Tense Omission Model (ATOM) predicts that children would produce null subjects with infinitive verbs since they license PRO subjects, e.g.,

I had **PRO** to see you.

Recall that Wexler (1998) assumes that initially children can only check the subject's D-feature once. Since the D-feature must be checked twice in English, this limitation prevents children from producing a finite form of the verb. Schütze and Wexler (1996) split English inflection into two features—tense and agreement, which can surface independently:

Features	Example	Prediction
[+ tense] [+ agreement]	she goes	Nom subject; null subject prohibited
[+ tense]	her go, her goed	Acc subject, null subject prohibited
[+ agreement]	she go, go	Nom subject, null subject possible
[]	her go, go	Acc subject, null subject possible

Wexler (1998) augments this framework with the stipulation that the use of null subjects with finite verbs is a result of topic drop, e.g.,

Adam (3;6) Tickles me.

Advantages:

ATOM ties subject use to an overt tense feature. The theory assumes that children's null subjects can take several forms—PRO and null topics in English, and pro and null topics in Italian. It predicts children's surface forms can be quite varied. It also accounts for the asymmetry in the use of null subjects and objects.

Problems:

1. The theory does not define 'infinitive'

Many languages lack an 'infinitive' and use deverbal nouns:

K'iche' x-θ-u-chap (u)-b'iin-eem
 compl-3Abs-3Erg-begin (3Erg)-travel-nominal
 'He/she began (his/her)-traveling.'

2. ATOM predicts the infinitive is an unmarked verb form. This is fine for English, but not Danish (Hamann 2002.204)

Danish has distinct present tense, past tense and infinitive verb forms:

infinitive	køb-e 'to buy'
imperative	køb
present tense	køb-er
past tense	køb-de

Danish also does not permit subject drop:

??? har ikke købt bogen
 has not bought the book

Despite these features, children acquiring Danish only begin using infinitives AFTER their finite verb morphology becomes productive (Plunkett & Strömquist 1990).

3. Adult PRO is **licensed** by the absence of tense, but **identified** through control:

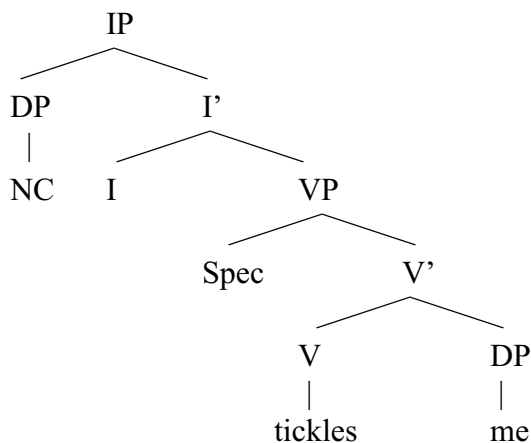
I promised Mary **PRO** to see you.
 I persuaded Mary **PRO** to see you.

ATOM does not account for the differences between child and adult identification (Hamann 2002.198).

4. The theory does not account for morpheme acquisition orders
5. The theory does not account for the other missing elements in children's sentences, e.g., verbs
6. The theory does not account for the gradual increase in morpheme use (Brown 1973).
7. The theory categorizes languages as either null subject or non-null subject languages and does not account for cross-linguistic differences in null subjects and objects.
8. 'the generally low frequency of non-nominative subjects with agreeing verbs has to be seen in the context of the frequency with which children produce non-nominative subjects and the frequency with which they produce agreeing as opposed to non-agreeing verbs...' 'the frequency with which non-nominative subjects with agreeing verbs would be expected to occur ... can be estimated very easily by multiplying the number of non-nominative subjects produced by the child by the proportion of nominative subjects that occur with unambiguously agreeing verb forms' (Pine et al.)

Truncation (Rizzi 1993/4)

Rizzi accounts for the missing elements in children's sentences by assuming that they do not produce complete tree structures. In particular, root infinitives lack the Complementizer projection. This enables children to produce finite sentences with null subjects:



Rizzi added a new type of empty category, the **null constant** (NC), to account for children's null subjects. Null constants are acceptable as long as they are not c-commanded by a potential antecedent.

Predictions:

1. Children's sentences may have null subjects, but not null objects.
2. Null subjects occur in root infinitives when the structure is truncated at VP.
3. Null subjects cannot occur in questions with a fronted wh phrase or auxiliary.
4. Null subjects cannot occur in embedded clauses.

Problems:

1. The theory assumes a discontinuity between child and adult grammars for the licensing of null constants.
2. The theory cannot account for the difference in null subject use with modal (5%) and main verbs (11%; Valian 1991).
3. The theory does not account for crosslinguistic differences in the use of null subjects in questions.

Use of null subjects and root infinitives in wh questions (Hamann 2002)

	Root Infinitives	Null Subjects
Adam	62.4%	35%
German	1%	4%
Danish	4.6%	7.3%
French	–	1%

4. The theory does not account for the gradual increase in subject use.

5. The theory does not account for the other missing elements in children's sentences.

Constructionist Approaches

Ambridge and Lieven present a constructionist account for the absence of subjects and tense inflection in children's language. They begin by assuming that children rote-learn a number of whole utterances as frozen phrases (p. 134), e.g. 'I'm eating it.'

The constructionist assumption does not predict that children will omit parts of adult utterances, it does not predict which parts children will omit, and it does not predict that children will systematically omit specific parts of adult utterances. Obviously, the basic assumption of the constructionist approach has to be modified (complicated!).

This is why Ambridge and Lieven present the MOSAIC model of omission (p. 152). The MOSAIC model does not assume that children learn whole utterances. Instead it assumes that children start with the ends of utterances and gradually add more words as they get better at processing utterances. This hypothesis is based on the **recency effect** that people are better at repeating what they hear last.

Take the example sentence *Can he play?* MOSAIC assumes that children will produce the sentence as:

1. play?
2. he play?
3. Can he play?

Ambridge and Lieven suggest that many child utterances in English derive from compound finites:

Compound finite utterance	Child utterance
(What) can/will/does he play?	He play
I saw him playing	Him playing
Peut-il jouer? (Can he play?)	Il jouer [French]
Wil hij spelen? (Can he play?)	Hij spelen [Dutch]

Advantages

1. Constructionist approaches highlight the connections between the language that children hear

and the utterances children produce. Generativists do not analyze the structure of the input language, and therefore underestimate what children are learning from the input.

Ambridge and Lieven present several studies that investigate the frequency of tense marking in the input and its correlation with children's use of tense marking.

Freudenthal et al. (2007) report a correlation between the proportion of utterance-final non-finite verbs in the input language and the frequency of non-finite verbs in the children's language.

Language	Adult speech	Children's speech
Dutch	87%	74%
German	66%	61%
Spanish	26%	22%
English	76%	50%

Freudenthal et al. (2010) found a lexical effect in that individual verbs differ in their frequency of use in compound finite constructions. The children's inflection of individual verbs correlates with the frequency that the verbs are inflected in the adult language. The lexical effect accounts for the different rates of inflection found on **event** verbs (e.g. play, climb, make and tell) and **state** verbs (e.g. want, need, like, be and have).

Wilson (2003) found that children begin with constructions based on particular lexical items (c.f. Maratsos & Chalkley). They then extract more general units by generalizing across lexically specific constructions.

Wilson tracked the use of copula *be*, auxiliary *be* and third person present tense *-s* in five children between the ages of 1;6 and 3;5.

He claims that the constructions children create with noun phrase subjects will be different from the constructions they create with pronominal subjects.

[Fig 2](#). Copula marking with third person closed-class and lexical NP subjects by time.

Problems

1. Constructionist approaches, like generativist approaches, ignore the contexts of use for each construction. One example is the expression of 'present' tense in English. More specifically, 'present' tense forms do not express actions that occur at the time of speech. Compare the use of event and state verbs in 'present' tense constructions.

Context	Event verbs	State verbs
Generic	A cow eats grass.	Grass needs water.
Habitual	Walter always walks to school.	Mary always has a sandwich.
Present	The dog is barking.	George wants an apple.

2. Constructionist approaches, like generativist approaches, do not predict children's verb forms in polysynthetic languages. English, Dutch and German are Germanic languages in which verbs

have a single suffix. French, Spanish and Italian are Romance languages in which verbs have a single suffix. Constructionist approaches do not predict which part of a verb complex children will produce.

Mam (Mayan)

ma Ø-kub' n-xeyb'a-'n-a
 recent abs3-down erg1-comb-dependent-enclitic
 'I combed it.'

Mohawk (Iroquoian) [Mithun 1989: 304]

wa'-hi-ken-'
 past-1.singular.agent/masculine.singular.patient-see-punctual
 'I saw him.'

Navajo (Athabaskan) [Courtney and Saville-Troike 2002: 624]

shí - áʔdo' - shá - da - 'í - Ø - † - tsóód
 obj1-also-for-pl-obj3-subj3-cl-impf.stem:feed
 'They were feeding it to me, too.'

Quechua [Courtney and Saville-Troike 2002: 624]

mikhu - chi - sha - wa - rqa - n - ku - pis
 eat-caus-prog-1obj-past-3subj-pl-add
 'They were feeding it to me, too.'

3. Constructionist approaches do not explain how children transition from a collection of constructions to the adult grammar. Constructionists do not explain the creation of grammatical categories such as 'verb', 'subject' and 'third person'.

Mayan Morphosyntax

Mayan languages use **ergative** markers for the subjects of transitive verbs and **absolutive** markers for the subjects of intransitive verbs and the objects of transitive verbs.

Intransitive verb with **absolutive** subject markers in Mam, Q'anjob'al and Yucatec

Mam (England 1983:166)	Q'anjob'al	Yucatec (Bricker et al.1998: 330)
ma chin b'eet-a	max- in b'ey-i	h b'in-ih- 0
REC abs1 walk-ENC	COM- abs1 walk-IV	COM go-IV- abs3
'I walked.'	'I walked.'	'S/he went.'

Mam, Q'anjob'al and Yucatec **extend** ergative marking to the subjects of intransitive verbs in special contexts.

Intransitive verb with **ergative** subject markers in Mam, Q'anjob'al and Yucatec

Mam (England 1983: 259)	Q'anjob'al	Yucatec
n-chi ooq' t-poon ky-txuu'	lanan ha-way-i.	táan a wen-el.
prog-abs ₆ cry erg3 -arrive erg ₆ -mother	prog erg2 -sleep-IV	prog erg2 sleep-nom _{IV}
'They were crying when their mother arrived.' 'You are sleeping.' 'S/he went.'		

Larsen and Norman (1979) observed that Mayan languages typically extend ergative markers to intransitive verbs in subordinate (non-finite) clauses. The extended ergative contexts in Q'anjob'al lack overt aspect marking and occur as complements to many verbs including -ab'ej 'hear', -al 'say', -nahaj 'decide suddenly', -nachaj 'know how', -kuyu' 'learn how', -il 'see', -ab'lej 'try', -na' think to', -ochej 'desiderative' (want), -xiw 'fear', -uj 'can', -lanan 'progressive' and -k'ol 'begin' (Pascual 2007).

The Yucatec aspect-mood markers include táan 'progressive' (ongoing, be...ing), ts'o'ok 'terminative' (conclude, result), táant ...-e' 'immediate past', ho'op' 'inceptive' (begin), k'áah 'inceptive' (begin), yan 'obligative' (must, have to), táak 'desiderative' (want), k'ab'éet 'necessitive' (need, have to), he' ...-e' 'assurative (future)' (surely, indeed), and biin 'predictive, indefinite future'. Yucatec verbs with the incomplete aspectual prefix k- also have extended ergativity.

The extended ergative contexts in Mam are defined by the absence of overt aspect marking commonly found in adverbial clauses and the complements to some verbs. England (1983: 264) states that 'These contexts include one type of embedded clause, purpose or result clauses, clauses which follow focused adverbials, and clauses which follow a few other specific adverbials. In addition, certain verbs in relative clauses require dependent person marking [=extended ergativity CP et al.], but only in a rather restricted semantic context.

Contexts of extended ergativity in Mam, Q'anjob'al and Yucatec

Context	Mam	Q'anjob'al	Yucatec
Temporal Adverb	extended		
Manner Adverb	extended	extended	extended
Desiderative	extended	extended	extended
Progressive		extended	extended
Incomplete			extended

The root infinitive hypothesis predicts that Mayan children who produce root infinitives would extend ergative markers to the subjects of intransitive verbs.

Adult speech

The frequency of ergative marker use in the adults' speech shows that children acquiring Yucatec hear ergative markers on intransitive 4 to 10 times more frequently than the children acquiring Mam and Q'anjob'al. The frequency analysis predicts that children acquiring Yucatec will acquire ergative marking on intransitive verbs earlier and more accurately than children acquiring Mam and Q'anjob'al.

Table 7. Number (percentage) of intransitive contexts in Mam, Q'anjob'al and Yucatec

Language	Speaker	Imperative	Absolutive	Ergative
Mam	mother	168 (66%)	64 (25%)	21 (8%)
Q'anjob'al	father	27 (16%)	140 (81%)	6 (3%)
Yucatec	mother	5 (13%)	14 (37%)	14 (37%)

The Children's Intransitive Utterances

The children produced utterances in contexts that closely followed the adult production. The Yucatec children produced 3-10 times as many utterances in contexts of extended ergativity as the Mam and Q'anjob'al children. The Yucatec children were more practiced at producing intransitive verbs in extended ergative contexts than the Mam and Q'anjob'al children.

Number (percent) of verb tokens produced in intransitive contexts in Mam

Children	Age	Imperative	Absolutive	Ergative
WEN	2;0-2;1	91 (38%)	132 (56%)	14 (6%)
CRU	2;5.2	2 (3%)	67 (93%)	3 (4%)
JOS	2;6.14	5 (6%)	73 (84%)	9 (10%)
Mother (WEN)		168 (66%)	64 (25%)	21 (8%)

Number (percent) of verb tokens produced in intransitive contexts in Q'anjob'al

Children	Age	Imperative	Absolutive	Ergative
Xhuw	2;0-2;1	211 (32%)	416 (64%)	23 (4%)
Xhim	2;5.2	93 (16%)	492 (83%)	7 (1%)
Tum	2;6.14	65 (11%)	498 (85%)	21 (4%)
Father (Xhuw)		27 (16%)	140 (81%)	6 (3%)

Number (percent) of verb tokens produced in intransitive contexts in Yucatec

Children	Age	Imperative	Completive	Incompletive	Subjunctive
SAN	2;0	4 (10%)	8 (20%)		4 (10%)
ARM	2;0	26 (42%)	12 (19%)	19 (31%)	5 (8%)
DAV	2;0	12 (27%)	14 (31%)	14 (31%)	5 (11%)
Mother (SAN)		5 (13%)	14 (37%)	14 (37%)	5 (13%)

The Children's Production of Ergative Markers on Intransitive Verbs

Mam

a. WEN (2;0.2)

wiin.
= i t-xi' w-ii-n-a
so ERG3-go ERG1-carry-DEP-ENC
'So that I go carry it.'

b. WEN (2;0.25)

taaxh jHunt kuun.
= *i t-ajs junt q-u'n.
so ERG3-return one ERG4-by
'So that another returns by us.'

Q'anjob'al

a. XHUW (2;4)

la low hin.
= lan *hin-lo-w-*i
PROG ERG1-eat-AP-IV
'I am eating.'

b. XHIM (2;9)

lan hamulnajil tom.
= lan ha-mulnaj-!il dom
PROG ERG2-work-ABST Dominga
'Dominga you are working.'

Yucatec

a. ARM (2;0.15)

ok peek'.
= *taan *uy-ok-*ol peek'
PROG ERG3-enter-NOM dog
'The dog is coming in.'

b. ARM (2;0.12)

k'éek'en hanah.
= k'éek'en *taan *u han-al(h)
pig PROG ERG3 eat-NOM
'This is the pig which is eating.'

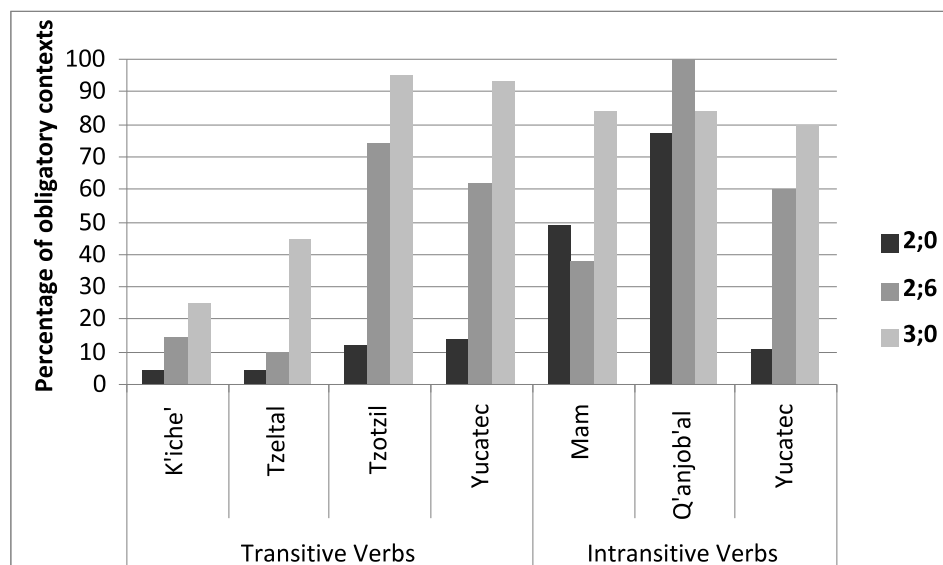
Number of tokens (percent of obligatory contexts) of extended ergative marking in Mam, Q'anjob'al and Yucatec

Age	Language	Speaker	tokens	percent
2;0	Mam	WEN	19	49%
	Q'anjob'al	XHUW	24	89%
	Yucatec	ARM	1	8%
2;6	Mam	JOS	24	38%
	Q'anjob'al	XHIM	2	100%
	Yucatec	ARM	4	80%
3;0	Mam	CRU	16	84%
	Q'anjob'al	TUM	16	84%
	Yucatec	ARM	4	80%
Adult	Mam	mother WEN	21	100%
	Q'anjob'al	father XHUW	3	100%
	Yucatec	mother SAN	160	96%

The comparative data indicate that the contexts rather than the frequency of ergative extension influence the children's production of extended ergative marking in each language. If the adult frequency of extended ergative marking influenced the children's use of extended ergativity we would expect lower rates of extended ergative marking by children acquiring Mam and Q'anjob'al. The children acquiring Q'anjob'al use extended ergative marking as frequently as the children acquiring Yucatec.

Finally, we can compare the Mam, Q'anjob'al and Yucatec children's production of ergative markers on intransitive verbs in contexts of extended ergativity with K'iche', Tzeltal and Tzotzil children's production of ergative markers in languages without extended ergativity. There is no indication that children acquiring languages with extended ergativity are disadvantaged by the marked nature of this ergative system. In fact, the differences between the individual languages are more marked than the difference based on whether or not the language has extended ergativity.

These data are best characterized by the different language profiles. Although K'iche', Tzeltal and Tzotzil lack extended ergativity, there are noticeable differences between the Tzotzil children and the K'iche' and Tzeltal children in their frequency of ergative production on transitive verbs. Although Mam, Q'anjob'al and Yucatec have an extended ergative system in common, there are noticeable differences between the languages in the children's use of ergative markers in extended ergative contexts. We conclude that abstract linguistic features such as ergative and absolutive are less important to children than their language-specific realization.



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