The Acquisition of Syntax in Quiche Mayan

Most proponents of the parameter-setting explanation of
syntactic acquisition would maintain that their approach is
diametrically opposed to cognitive/semantic approaches. The
former begins with syntactic theory and deduces plausible
learning schemes, while the later starts with some general theory
of cognition and suggests how such strategies could be applied to
language. However, both assume that children begin with the some
sort of universal grammar which they gradually adjust to suit the
language of their community. In this paper I will present some
data from Quiche which challenges the assumption that all
children begin at the same initial starting point.

Quiche is a Mayan language spoken in western Guatemala by
approximately a half million people. The language has a VOS
canonical word order and ergative morphology. Agreement markers
on the verb indicate the grammatical role of nouns. Thus, Quiche
is a language with pro-drop, but with the added possibility of
dropping object NPs as well as subject NPs. Despite the lack of
case marking on the NPs, word order is very flexible. The
changes in word order sometimes trigger morphological changes in
the verb phrase. Passive and antipassive verb morphology serve
as additional clues to noncanonical grammatical role marking in
adult and child language alike.

I collected samples of spontaneous speech from three Quiche
children over a nine-month period. I visited the children in

their homes approximately every two weeks, for a one-hour play

session. The children were initially aged 2;0 to 3;0 when I

first visited them. I transcribed and translated the tapes with

the help of two native Quiche speakers: Augustin Huix Huix and

Pedro Quixtan Poz. Several measures of the children's language

ability across the samples are shown in Table 1.

§Quiche and parameter-setting predictions§

Hyams (1986) used Chomsky's (1981) pro-drop parameter to

explain several aspects of the acquisition of syntax in English

and Italian. Hyams predicts that children begin with the pro-

drop parameter fixed as it is in adult Italian. A child learning

English then encounters positive evidence in the form of overt

expletive elements and/or auxiliary verbs that enables the child

to reset the parameter for a non-pro-drop language. Hyams

observes that the initial pro-drop setting accounts for a

constellation of facts about early syntactic development in both

English and Italian. These include the possibility of null

subjects, the absence of auxiliary verbs, and the absence of

lexical expletives.

Admittedly, Hyams' model doesn't adequately account for the

child language data in English. Her argument that children

acquiring English use null subjects rather than null verbs or

null objects boils down to the greater frequency of subject

omission in data from Brown (1973), Bloom (1970) and Braine

(1973). No where does she count the number of times these

children omit NPs in subject position, although she does state that Bloom's subject Kathryn omitted objects in 4 out of 55 utterances (p. 68, fn 8). By her own frequency criteria, Hyams' theory is falsified by Bowerman's (1973) data for Kendall.

Quiche provides a more interesting test. In the first place Quiche permits pro-drop in the object position as well as subject position. The sentence shown in (1) is perfectly grammatical in Quiche without independent pronouns for either subject or object. The conditions for dropping the object pronoun in Quiche are identical to those for dropping the subject pronoun. An overt pronoun only occurs in either position if it is necessary to disambiguate the referent or to emphasize the referent.

Assuming that pro-drop in both subject and object positions is parametrically governed, the frequency of null object NPs should equal the frequency of null subject NPs at the earliest stage of acquisition. This is because parametric theories as they presently exist only specify when an option is available, not how often it is exercised. There is no syntactic reason to assume that pro-drop would occur more frequently in one position than another. The Quiche data on the presence of subjects and objects is shown in Table 2. Table 2 shows that Quiche children omit subjects two to six times more frequently than they omit objects. Averaged across all 15 sessions Al Tiya:n omitted subjects in 92% of her utterances while she only omitted objects in 67% of her utterances.

Table 2 might still support Hyams' position, if pragmatic effects are taken into consideration. Hyams could argue that the subject and object positions differ with respect to the frequency with which a nonemphatic pronoun would occur in either position. For this argument to go through, however, the differential presence of subjects and objects should be approximately the same in Quiche and English at an initial stage. If they are different, it is evidence that children are sensitive to the particular pragmatic rules of their language and not starting with any universal set of pragmatic principles. There is little reason to think that pragmatic principles are any easier to acquire than syntactic ones although no one has yet proposed how children accomplish such a task.

Unfortunately, the necessary data are not generally available for English. Pinker (1984:130) cites unpublished analyses of Brown which show that "there is a .30 probability of a noun's appearing in subject position in sentences containing a verb and a .80 probability of its appearing in object position". This is not quite what I need, but it should serve as an estimate. It would appear that the Quiche children use object NPs significantly less often than children learning English (44% vs. 80%). This is also true for the subject position, where Quiche children used lexical NPs in 14% of their utterances while children learning English use NPs in 30% of their utterances.

It is this type of discrepancy that leads me to conclude that children at even the earliest stages of language acquisition

are affected by the adult grammar. Even though children learning
English and Quiche omit subjects more frequently than objects,
Quiche children do this significantly more frequently than
children learning English. Thus, the conditions governing
subject omission are not the same for children acquiring English
and Quiche. Even at the earliest stages, children learning
English show an awareness of the obligatory subject. They don't
always produce subjects because of production constraints.
Production constraints also account for the gradual increase in
the frequency of lexical subjects in the children's speech.

The Quiche children used both pronouns and agreement markers
on the verb to mark subjects (see Table 3). Comparing Table 2
and 3 shows that almost all the lexical subjects in the Quiche
children's speech were pronouns. This appears to be slightly
higher than it is for children learning English, who use
pronominal subjects in approximately 80% of their utterances
(Bloom, Lightbown & Hood 1975). Pronouns and agreement markers
for the subject emerge at about the same time in the Quiche
children's speech. From the beginning, the children seem to use
the pronouns to emphasize the subject rather than as a
replacement for the agreement markers--a further indication that
they are aware of the pragmatic constraints on the pro-drop rule.

§Cognitive models

I will turn now to several predictions based on cognitive
explanations of language development. Despite their inability to

account for the acquisition of even elementary syntactic
structures such models still maintain the allegiance of most
psychologists. One old bone is the belief that the word order
subject-verb-object corresponds to a natural order of perception
or cognition. Slobin (1982) cites three independent arguments by
Bruner (1975), McNeill (1975) and Osgood (Osgood & Tanz 1977)
that predict the early use of SVO and SOV word orders, but not
others. Slobin presents evidence from the acquisition of
Turkish, Finnish and Russian to show that children have no
trouble using non-English word orders from the beginning. Quiche
provides further evidence that young children do not experience
any difficulty grasping the function of non-English word orders.

The pro-drop rule in Quiche makes it difficult to find
direct evidence for the early use of the VOS word order. As
shown in Table 2, a lexical subject only occurs in 8 to 14
percent of the children's utterances. However, the children
produced two-term utterances (containing a verb and a subject or
object) fairly frequently. I report these results for the
individual children in Table 4.

The data from the children's two-term expressions shows an
unequivocal tendency to use a verb-initial word order. The few
cases where the Quiche children produced the subject in preverbal
position are not evidence that a natural tendency survived
despite overwhelming evidence in the surface structure of Quiche.
Note that the children produced even more instances of object
verb utterances, something that cognitive/perceptual accounts

would not predict. Instead, they are further instances of the children's awareness of pragmatic constraints--in this case on the order of words in the sentence. Some examples of the children's three-term utterances are shown in (2).

More recently, Slobin (1985) has hypothesized a universal Language-Making Capacity which constructs a Basic Child Grammar in the initial stage of language acquisition. Slobin claims that all children first express the same basic notions leading, in many cases, to utterances which do not follow the rules of adult grammar. For example, Slobin claims that children first use markers for linguistic transitivity when talking about prototypical Manipulative Activity Scenes which refer to objects the child wants to have or act upon. He defines the Manipulative Activity Scene as "a basic causal event in which an agent carries out a physical and perceptible change of state in a patient by means of direct body contact or with an instrument under the agent's control" (1175). He further states that, "Basic Child Grammar, however, tends to grammaticize whole Scenes and their most salient components; and since Scenes represent prototypical activity types and conceptions, rather than language-specific categories, the first functors to appear in child speech, universally, should relate to the same complexes of Notions, regardless of the particular surface forms extracted from the input language." (1176).

As support for his hypothesis Slobin cites Gvozdev's (1949) data on the acquisition of Russian where the accusative

inflection was first limited to the direct objects of such verbs as 'give', 'carry', 'put', and 'throw'. Schieffelin's (1985) data on Kaluli also shows that the ergative inflection first appears only on the subjects of verbs such as 'give', 'grab', 'take', and 'hit', and it tends to be omitted in sentences with verbs such as 'say', 'call-out', 'see' and 'do'. Schieffelin also found that her subjects first used the ergative marker when the verb was in the past tense.

To test Slobin's hypothesis I first sorted the Quiche children's verbs into two groups: highly transitive and others. These are shown in Table 5. I based my classification on Tsunoda's (1985) chart of degrees of transitivity. According to Slobin's hypothesis, the Quiche children should first use the ergative markers with the highly transitive verbs. This prediction is complicated by the fact that the children continued to use new verbs in each session. For the sake of completeness, I have included all the sessions and simply averaged the session numbers in order to derive the average session in which the Quiche subjects began using the ergative person marker with the two groups of verbs. Another problem is when the children should be counted as using the person markers. Due to the way some person markers are divided by a syllable boundary, the children sometimes only used part of the person marker. I only counted the cases in which the children used the complete person marker. The results are shown in Table 6. A visual inspection of these tables shows that the Quiche children did not use ergative

markers on highly transitive verbs before the others, in fact, the opposite appears to be more accurate.

A further possibility is that the completion or modality of the action might have influenced the children's use of the ergative markers. To test this possibility I separated the children's use of the ergative markers into four groups depending on the aspect or modality of their utterance. These groups were: incompletive and completive aspect, imperative, and negative. The averaged results for the children are shown in Table 7.

According to Schiefflin's and Slobin's hypotheses the Quiche children should have first used the ergative markers with the verbs in the completive aspect since this represents the case in which the action is fully realized. Table 7 demonstrates that this was not the case. If anything, the Quiche children tended to use the ergative marker slightly later in the completive aspect. Table 8 provides a comparison between the just the completive and incompletive contexts. For each child I counted the number of verbs in which the ergative marker appeared earlier with the completive form or with the incompletive form. The results for Al Tiya:n and Al Cha:y are significant by the Sign Test (<.01, two-tailed).

One possibility that is frequently overlooked in the rush to find cognitive determinants of language acquisition is the effect of the verb's phonological form on the children's use of the person markers. In this case there is the possibility that the Quiche children would first use the ergative markers with

monosyllabic verbs. The results of this test are shown in
Table 9. The results in this case are much sharper than in the
previous tests and demonstrate a clear trend toward first using
the ergative markers with monosyllabic verbs. This trend appears
to be more exaggerated for Al Tiya:n, possibly because she is
just beginning to use the ergative markers.

§Conclusion

In this paper I have tested the predictions of two radically
different accounts of syntactic acquisition and found both to be
wanting. In both cases, the source of the problem is the
insistance of both models on some universal starting point for
the acquisition of syntax. Children, however, demonstrate a
remarkable sensitivity to the unique properties of the language
they are attempting to learn. An account which assumes that
children begin with the adult grammar of the particular language
with the addition of freer elision rules would be closer to the
developmental facts than either of the models I discussed. But,
of course, such an account would not explain how the children had
acquired their particular grammar. The facts indicat that
children are sensitive to the superficial properties of the
language they are immersed in. They are not so attached to any
particular grammatical theory that they will discount what they
hear all around them. We must determine the extent of children's
sensitivity to surface structures in order to model the
acquisition process successfully.

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Table 1. Ages and MLUs across the language samples.
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	Al Tiya:n		Al Cha:y		A Carlos	
Sample	age	MLU	age	MLU	age	MLU
1-3	2;1.17	1.2	2;9.8	1.6	3;1.5	1.8
4-6	2;2.6	1.4	2;10.6	2.1	3;1.25	2.4
7-9	2;3.19	1.8	2;10.27	2.2	3;4.2	2.8
10-12	2;7.21	2.1	3;0.16	2.7	3;4.23	2.8
13-15	2;10.5	2.8	3;1.5	2.7	3;6.26	3.1
16-18			3;2.28	3.0	3;8.5	3.3
19-21			3;4.10	3.2		

(1) k-at-in-q'alu:j   k-in-a-q'alu:j
    asp-2A-1E-hug   asp-1A-2E-hug

    I will hug you.   Hug me!

Table 2. Frequency of lexical subject and object NP tokens in
          Quiche children's utterances with transitive verbs.
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	Al Tiya:n			Al Cha:y			A Carlos		
Sample	verbs	subj.	obj.	verbs	subj.	obj.	verbs	subj.	obj.
1-3	23	–	4	164	13	71	24	3	18
4-6	45	5	14	235	36	107	63	8	33
7-9	61	4	23	215	42	100	279	44	121
10-12	113	8	31	292	32	133	283	8	111
13-15	131	15	51	275	38	105	254	20	117
Total	373	32	123	1181	161	516	905	83	400
Mean percent	8%	33%		14%	44%		9%	44%	

Table 3. The use of pronouns and agreement markers in Quiche
         children's speech (subject position of transitive verbs
         only).
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	Al Tiya:n		Al Cha:y		A Carlos	
Session	pronouns	agreement markers	pronouns	agreement markers	pronouns	agreement markers
1-3	–	9	20	3	2	17
4-6	3	5	29	10	3	63
7-9	3	6	28	12	25	128
10-12	5	19	30	48	6	152
13-15	12	25	32	51	23	130
13-15 as % of tvs	9%	19%	12%	18%	9%	51%

Table 4. Word orders in Quiche children's speech
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	Al Tiya:n				Al Cha:y				A Carlos			
	SV	VS	OV	VO	SV	VS	OV	VO	SV	VS	OV	VO
1-3	–	–	1	3	2	11	4	67	–	3	2	16
4-6	–	1	1	4	4	32	4	103	–	6	–	33
7-9	1	3	2	20	5	32	5	95	6	37	8	106
10-12	–	8	3	28	5	27	8	125	–	7	4	102
13-15	1	12	2	48	6	32	10	95	–	19	7	94
Total	2	24	9	103	22	134	31	485	6	72	21	351
Percent	1%	17%	6%	75%	3%	20%	5%	72%	1%	16%	5%	78%

	Al Tiya:n	Al Cha:y	A Carlos
VOS	1	52	5
VSO	5	36	10
SVO	2	20	3
SOV			
OVS	1	6	3
OSV		1	1

(2)

Al Tiya:n

   VOS axej wi:b' at (= x-0-a#xe7j aw-i:b' at) (S15-4)
     scared yourself you
     You scared yourself.

   VSO yakom ate le: q'ab'e (= 0-a#ya-om at le: q'ab'-e) (S14-6)
     have got you that hand there
     You have got that hand there.

   SVO lah ti tu wakax (= alah k-0-u#tij ta u-wakax) (S7-58)
     boy eats not his cow
     The boy is not eating his cow.

 A Carlos

  VOS utij jun umux le: le: le: Ci:j
    (= k-0-u#tij jun u-mux le: le: Ci:j) (C6-40)
    eats one his swim that there sheep
    That there sheep is swimming.

  VSO inqupij in e nayl (= k-0-in#qupij in e: nayl) (C8-31)
    I tear I the nylon
    I'm tearing the nylon.

  SVO le: jun tij Cikopi7 (= le: jun k-0-u#tij Cikopi7) (C7-38)
    that one eats animals
    That one eats animals.

  OVS li koj in (= ri k-0-in#koj in) (C9-38)
    this use I
    I'll use this.

  OSV we jun at e ayojij (= we jun at k-0-a#yojij) (C8-60)
    if one you scold
    if you scold one.

Table 5.   The Quiche verb types
===
         Highly Transitive   Others

ch'aj   'wash'   ku   'hide'   ch'ob'   'know'
ch'ay   'hit'   mulij   'gather'   ch'ab'ej   'speak'
ch'up   'pick'   okisaj   'put into'   tzaq   'lose'
chap   'grab'   pach'   'stomp'   tze7ej   'laugh'
chararej   'move along'   paxij   'break'   tzukuj   'look for'
chup   'put out'   pis   'wrap'   aj   'want'
tz'ib'aj   'write'   puyij   'push'   b'an   'make, do'
tzir   'heal'   q'aluj   'hug'   b'ij   'say'
tzoqopij   'untie'   q'o   'paint'   etamaj   'learn'
tzuq   'feed'   q'upij   'break'   il   'see'
b'inisaj   'move along'   qapij   'cut'   iyej   'wait for'
b'iq   'swallow'   setatej   'round'   jach -ib' 'separate'
b'oq   'root out'   sipaj   'gift'   k'ayij   'sell'
etzab'ej   'play'   su7   'wipe'   k'ol   'guard'
elaq'aj   'steal'   sutij   'spin'   k'ut   'show'
eqaj   'carry'   t'is   'sew'   koj   'use'
esaj   'take out'   t'op   'peck'   loq'   'buy'
jat'ij   'tie'   ti7   'bite'   q'i   'withstand'
jik'   'pull'   tij   'eat'   riq   'find'
k'am   'bring'   toqij   'snatch'   sik'ij   'call'
k'aq   'throw'   turij   'loosen'   siq   'smell'
k'atisaj   'light'   wok   'make a fire' ta   'hear, ask'
k'ex   'change'   xut'uj   'blow'   xe7j -ib' 'scared'
kir   'untie'   ya   'give'   yojij   'scold'

Table 6.   Use of the ergative marker with highly transitive verbs.
===
                   Highly Transitive   Others
Subject   n   x   n   x
Al Tiya:n   12   12.2   6   11.3
Al Cha:y   29   16.9   22   13.5
A Carlos   37   9.4   18   7.6

Table 7.   Children's use of the ergative in four verbal contexts.
===
                Incompletive Completive Imperative Negative
                 n   x   n   x   n   x   n   x
Subject
Al Tiya:n   14 11.1   5 14.6   5 11.2   4 11.2
Al Cha:y   43 16.0   15 16.2   10 13.8   13 16.6
A Carlos   39   8.7   16   9.6   29   9.3   12   9.4

Table 8.   First use of ergative in completive and incompletive.
===
                Completive < Incompletive   Incompletive < Completive
Subject
Al Tiya:n   2   13
Al Cha:y   10   39
A Carlos   19   33

Table 9. Children's use of ergative markers with monosyllabic
          and polysyllabic verbs.
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	Monosyllabic Verbs		Polysyllabic Verbs	
Subject	n	x	n	x
Al Tiya:n	11	10	7	13.4
Al Cha:y	28	13.2	24	18.1
A Carlos	36	8	21	9.9

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