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SETTING THE ERGATIVE PARAMETER

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1. The Acquisition of Grammatical Relations

Any child acquiring English is faced with the task of working out the proper expression of the grammatical relations of subject and object. Only a knowledge of grammatical relations, not thematic relations, will allow the child to:

1. use the proper word order - subject verb object, as in the sentence "Mary was noticed by John" where Mary is the subject despite the fact that she has the thematic role of stimulus.
2. mark subject-verb agreement appropriately.
3. learn the rule of subject-auxiliary inversion.
4. learn the control relations between different clauses, as in the sentence "Jennifer came to see Paul."

A number of authors (Culicover & Wilkins 1986, Lyons 1977, Macnamara 1972, O'Grady 1987, Pinker 1984) have assumed a direct correspondence between semantic and syntactic roles in order to explain the child's initial acquisition of grammatical relations. The Semantic Bootstrapping Hypothesis, as this theory has come to be known, assumes that children begin their acquisition of syntactic relations by equating the subject of a sentence with the Agent. The Semantic Bootstrapping Hypothesis differs from previous semantically based acquisition theories in assuming that children only rely on semantic relations to establish the initial syntactic structure for their language. Once this structure has been established, children can rely on distributional evidence to decide on the syntactic structure for sentences without clearcut semantic relations, e.g. 'I love you'.

Obviously, in order for Semantic Bootstrapping to succeed, the correspondence between semantic and syntactic relations must be the same in all languages. The strongest version of this hypothesis was proposed by Perlmutter & Postal (1984). Their Universal Alignment Hypothesis states that one can predict the initial grammatical relation of each nominal in a clause on the basis of the semantic representation of the clause. If the

Universal Alignment Hypothesis was correct then children would have little difficulty at all in establishing grammatical relations by semantic bootstrapping. The question I wish to address in this paper is whether Universal Alignment holds in every language. I will approach this question by examining the notion of ergativity.

2. Ergativity

Traditionally, an ergative language is defined as a language in which the subject of an intransitive verb is treated in the same way as the object of a transitive verb (see Dixon 1979). There is thus a distinction between the subject of transitive verbs and the subject of intransitive verbs. An example of this distinction is shown in (1) which contrasts the ergative person marking system of the Mayan language Quiche with the accusative system of English.

(1) Accusative		Ergative	
English	He came	Quiche	x- \emptyset -pet-ik Asp-3Abs-come-term.
	I saw him		x- \emptyset -inw-il-oh Asp-3Abs-1Erg-see-term.

The subject of both transitive and intransitive verbs in accusative languages takes a nominative marker (either a case marker on the noun or a subject marker on the verb). Only the subject of transitive verbs in ergative languages has an ergative marker. The subject of intransitive verbs and the object of transitive verbs have an absolutive marker. In accusative languages only the object of transitive verbs receives the accusative marker.

On the surface, the contrast between accusative and ergative languages presents the child with the simple problem of determining the function of the case or person markers in the language. It raises the question of whether a child acquiring an ergative language might first assume that the language is really accusative and thus overextend the ergative marker to the subject of intransitive verbs. This would seem to be especially likely given the prominence of the notion of subject in Universal Grammar. What would be more natural than learning that a particular marker refers to the subject of prototypical manipulative activities and extending that same marker to all subjects? No existing theory predicts that children would not overextend the subject marker.

The trouble with such a learning procedure is that data from children acquiring ergative languages does not contain the predicted overextensions. Quiche, for example, has three sets of subject markers shown in (2). The choice between the two ergative sets is conditioned by the initial phoneme of the verb root. A child learning Quiche would have to distinguish between both transitive and intransitive verbs and between the allomorphic variants of the ergative set in order to use the subject markers successfully. Any confusion would be quite evident - particularly if the child used a prevocalic allomorph of the ergative set with an intransitive stem. The homonymy between the first person forms increases the likelihood that children would confuse the ergative and absolutive subject markers.

(2)	Ergative		Absolutive
	Prevocalic	Preconsonantal	
1	inw-	in-	in-
2	aw-	a-	at-
3	r-	u-	0-
4	q-	qa-	uj-
5	iw-	i-	ix-
6	k	ki-	e-

Tables 1 and 2 provide Quiche data on the acquisition of subject markers (see also Schiefflin 1985). In Table 1, an overextension of an ergative marker to an intransitive verb was considered an error in the use of the ergative marker. The overextension of an absolutive marker to a transitive verb was counted as an absolutive error. I counted any appearance of a pronoun before the verb as a person marker. In particular, I did not try to distinguish between cases in which the child used a pronoun in preverbal position to emphasize the referent. Since the pronouns are identical in form to the absolutive set of person markers, the result appears as an error in the use of the intransitive person markers. I am fairly confident that the children did not intend to use these forms as person markers since there is often a pause between them and the verb, something that never occurs with person markers on the verb. Al Cha:y, in fact, prefaced some of these pronouns with the word *kol* 'as for,' which frequently accompanies the emphatic pronouns in adult Quiche. Emphatic pronouns account for 6 of the 7 errors for Al Tiya:n and Al Cha:y.

Table 1. Overextensions of subject markers

Session	Al Tiya:n		Al Cha:y		A Carlos	
	Abs	Erg	Abs	Erg	Abs	Erg
1-3	-	-	-	-	-	-
4-6	-	-	2	1	-	-
7-9	-	-	1	-	-	5
10-12	-	-	2	-	-	1
13-15	1	-	-	-	-	1

As Table 1 shows, the children only made a small number of errors. There are two possible explanations for this pattern of overgeneralizations. The first is that the children did not, in fact, overgeneralize the person markers. If this were the case, I would need some explanation for the errors in Table 1. One explanation is the confusion of emphatic pronouns with the person markers. Another explanation would be an improper interpretation of the children's segmentation errors. A Carlos' production in C18, a *xa toq'ik*, could be interpreted as an overgeneralization of the person marker or a simple missegmentation. This would still leave a few cases that appear to be genuine overextensions. Two occurred in Al Cha:y's sessions 19 and 23. In session 23 she wanted me to spin her around, but used the transitive first person plural subject marker *qa-* with an intransitive verb form - *sutinik* 'spin'. She might of meant to use the transitive form - *suti:j* or the causative - *sutinisa:j* which she had used just before. Appendix A presents all of the overgeneralizations I was able to find in the Quiche data.

A second interpretation of these results would be that the children had not reached a stage where frequent overgeneralizations would be expected. Ingram (in press) reviewed the data on overgeneralization in Cazden (1968) and found that Adam, Eve and Sarah did not really begin to overgeneralize the plural to irregular nouns until they had begun using it in over 90% of its obligatory contexts. As Table 2 shows Al Tiya:n and Al Cha:y had not begun to use the person markers in even a quarter of their obligatory contexts while A Carlos only supplied the person markers in half of their obligatory contexts. Table 1 further suggests (if the emphatic pronoun interpretation is correct) that Quiche children start extending the ergative person markers to intransitive verbs when they are using the person markers in half of their obligatory contexts.

Table 2. Percentage presence of subject markers on Quiche verbs

Session	Al Tiya:n				Al Cha:y				A Carlos			
	Ivs		Tvs		Ivs		Tvs		Ivs		Tvs	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1-3	6	86	9	39	-	-	3	2	19	50	17	71
4-6	3	50	5	11	9	39	10	4	20	67	63	50
7-9	4	31	6	10	5	22	12	6	32	58	128	46
10-12	6	38	19	17	3	7	48	16	17	65	152	54
13-15	4	10	25	19	2	9	51	18	31	70	130	51

There are two problems that I see with the second interpretation. I have listed all of the children's overgeneralizations in Appendix A, including those from Al Cha:y's and A Carlos' later transcripts. These do not show any marked increases in the number of overgeneralizations that the second interpretation would predict. This is despite that fact that Al Cha:y's and A Carlos' use of several of the person markers has reached 90% presence. The second problem is that A Carlos' overgeneralizations in his eighth transcript occur with an antipassive form of a verb that is usually transitive. This error could be interpreted as either an overgeneralization of the ergative person marker or a failure to distinguish between the active and antipassive forms of the verb.

Considering these problems in data interpretation, I tentatively conclude that the children did not produce a significant number of overgeneralizations. It therefore seems advisable to alter the simple learning procedure I described above to consider both subject marking and transitivity simultaneously. Procedures described in Bowerman (1985) and Pinker (1984) do just this. Children could start by learning the markers for the subject and object of transitive verbs and look for evidence from the input in order to determine the correct marking for intransitive subjects. On the other hand they could begin by learning how their language marks the subjects of intransitive verbs and check the input to see whether this marker is similar to that of the subject or object of transitive verbs.

Either procedure predicts an initial asymmetry in children's use of subject markers. In the first version, they should first use the markers with the subjects of transitive verbs, whereas in the second version, they should first use the markers with the subjects of intransitive verbs. Rather than overextending the subject marker as the first procedure predicts, they should underextend the subject marker in the second procedure. Unfortunately, there is no sign of such an asymmetry in the

acquisition data. As Table 2 shows, Quiche children produce the subject markers of transitive and intransitive verbs at about the same rate. Bowerman (1985) discusses other evidence which suggests that children do not underextend subject markers in the way the second procedure would predict. Thus, the first two learning procedures both seem to be at odds with the acquisition data.

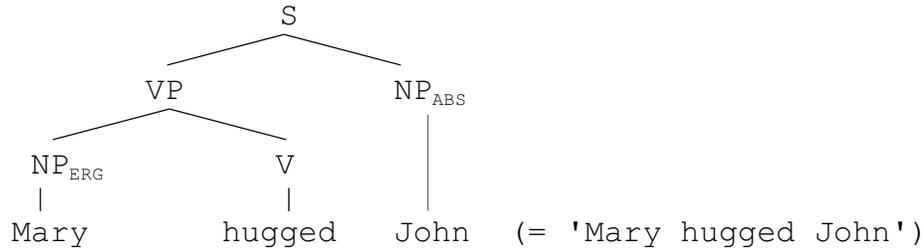
Of course, it is easy to fix the procedure so that it accords with the acquisition data. It only requires that children distinguish between the subjects of transitive and intransitive verbs from the beginning and then check the input to see which marker each of these subjects requires. Once a child distinguishes a marker for the subject of a transitive verb s/he will use it exclusively for the subjects of transitive verbs. Once the child distinguishes a subject marker for intransitive verbs, s/he will use it exclusively to mark the subjects of intransitive verbs. As soon as the child notices the similarity between the subject markers (if the language is accusative) the child can merge the two categories into one - the subject marker of the verb.

While this procedure is not contradicted by the acquisition data I do not believe it "explains" the data either. For example, this procedure predicts that children acquiring accusative languages would initially distinguish between the nominative NPs of transitive and intransitive verbs. I do not know of any evidence that children make such a distinction, and yet such evidence is needed to confirm this procedure. The lack of evidence can be explained away by assuming that the period during which children make the distinction would not last more than a few days, but this weakens the theory by undermining the only way of testing it.

3. Syntactic Ergativity

Another potential prediction of this procedure is that children learning ergative languages would merge the subject of intransitive verbs with the object of transitive verbs to create a new category - the subject of the verb. In this case the ergatively marked noun phrase would be the object (as in (3)). There is nothing in the procedure *per se* that would rule out category merger for ergative languages.

(3) Ergative NP as object



In fact, the structure in (3) has been proposed as the underlying structure in syntactically ergative languages. The structure in (3) conforms to the traditional "passive" interpretation of ergative constructions since the mapping between semantic and syntactic roles is similar to that of the passive in accusative languages (cf. Gabelentz 1860, Hale 1970). Marantz (1984) adopted this structure as the basis for his Ergativity Hypothesis (Woodbury 1977 proposes the same correspondence). Marantz sets up an ergative parameter which distinguishes between the semantic - syntactic correspondences of ergative and accusative languages, as in (4).

(4) Marantz's ergative parameter

Accusative	Ergative
subject - agent	subject - patient
object - patient	object - agent

As Plank (1979) points out in his insightful discussion, any exploration of the nature of ergativity presupposes an independent framework of semantic and syntactic roles. Since none is presently available, I shall simply assume a basic set of semantic roles and limit my discussion to the identification of the syntactic subject. Keenan (1976) provides a useful list of subject properties from which it is possible to predict how the subject of a syntactically ergative language will behave.

Three of Keenan's tests are not applicable in many languages. Passivization is not a diagnostic of subjecthood because ergative languages have an antipassive rule which changes the ergative NP to an absolutive. This means it is impossible to tell whether ergative languages have a "passive" rule which is a mirror image of the passive in accusative languages, or whether ergative languages just have another type of advancement rule that is distinct from the usual passive. The linear order test is defeated by languages such as Quiche which have VOS word orders (cf. Pullum 1977). Finally, many languages do not have verbal equivalents of such verbs as *seem* or *appear*. Instead, these concepts may be translated as verb particles.

4. The Acquisition of Ergative Languages

The existence of languages with syntactic ergativity raises a difficult problem for present accounts of the acquisition of verb argument structure. Remember, such theories assume a simple correspondence between thematic and syntactic roles for at least a set of prototypical verbs. Semantic bootstrapping would lead children to exactly the wrong conclusion for languages such as Yup'ik and Dyirbal where the correspondence is the reverse of accusative languages. When exposed to simple sentences such as "Henry-erg hugged Jennifer-abs" the child would simply assume that *Henry* was the subject. This assumption would receive massive confirmation from the other simple, active sentences in the child's input so that the "subject = ergative" rule would become well entrenched in the child's grammar.

This, in turn, would lead to a number of errors in the child's later grammatical development. Dyirbal children would be unable to interpret such sentences as "Woman-abs laughed man-erg see-Purposive" (Dixon 1980:458). The children would produce ungrammatical sentences with conjoined clauses, such as "The man-abs went downhill and saw the dog-abs" (Dixon 462). They would form passive sentences such as "Jennifer-erg was hugged." They would be more likely to form questions such as "Who is calling?" rather than "Who is being called?" Finally, the children would interpret reflexive sentences as passive rather than active. In short, there should be an enormous amount of evidence that children acquiring ergative languages had picked the wrong noun phrase as subject.

The Semantic Bootstrapping Hypothesis could be saved if children had some way to set the ergative parameter. Interestingly, children can not rely upon the language's morphology to determine whether or not the language was syntactically ergative. Quiche, with its perfectly ergative morphology is syntactically accusative whereas Dyirbal has accusative morphology for the first and second persons and yet is syntactically ergative.

This means that children acquiring a syntactically ergative language would have to start by assuming the language was accusative and then find some way of correcting their mistake. However, it is difficult to see how a child would be able to identify the nature of the error, let alone correct it. When a Dyirbal child understood a sentence with a purposive clause (e.g. "Woman-abs laughed man-erg see-Purposive"), s/he might interpret the purposive inflection as a type of passivizing morpheme. This would actually allow two possible interpretations, e.g. "The woman laughed and was seen by the man" or "The woman laughed to see the man." The children could reject the latter

interpretation on the basis of the nonlinguistic context which would presumably show that the man saw the woman and not the other way around. The former interpretation would save the rule that subjects of embedded clauses are controlled, but miss the fact that the absolutive NP is the subject of an active clause, not a passive one.

If the child realized that the embedded sentence was active rather than passive, he might succeed in interpreting the sentence as "The woman's laughing caused the man to see PRO." Since PRO cannot have a governing category, and since the last interpretation implies that the embedded verb governs PRO the child would have strong evidence that his grammatical structure was fundamentally flawed. However, the correction would require a wholesale restructuring of the child's phrase structure rules. Since the old rules would be strengthened each time the child correctly interpreted a simple sentence, they would be extremely resistant to change on the basis of a few complex sentences.

It is hard to escape the conclusion that children do not have any reliable evidence for setting the ergative parameter. This has the unfortunate implication that children do not really acquire a syntactic relation like subject in an all or none fashion assumed in much of the acquisition literature. There may, in fact, be no alternative to discovering which nps function together syntactically across a number of different structures in any particular language. Children may have to work out for themselves what the actual features of subjects in their language are.

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APPENDIX A

Person Marker Overgeneralizations

Al Tiya:n

S14-3 at-pisoj (at a-piso:m) "You have wrapped it."

Al Cha:y

R6-2 x-i-7ek (x-in-7ek) "I went."
-53 no uj tij b'ik (ka-qa-tij) "We eat it!"
-59 at, tij e b'inka (k-a-tij) "You eat it."
R8-57 at tej (ch-a-gatej)
R11-34 kol at chap taj (k-a-chap) "You're grabbing it."
R12-1 kal at koj (k-a-kojoh) "You're using it."
R16-14 j-a chupa:m (j-at) "Go inside!"
R18-23 puta parex k-0-anoh (k-u-7anoh) "He's doing it."
R23-20 no7 qa-xutanik (k-uj-sutinik) "Let's spin."
-21 qu-xutanik " "

A Carlos

C7-13 (twice) a-kula (ch-at-kula) "Come!"
C8-13 (twice) at a7a-yowik (x-at-yowik) "You gave s.t."
-20 at e-yowik " "
C12-40 u-stinik (ka-0-sutinik) "It's spinning."
C15-43 a-koti7ik (k-at-kote7ik)
C17-24 x-0-iloh (x-r-iloh) "He saw it."
-43 x-ix-loq' wih (x-i-loq') "You all bought it."
C18-29 a xa toq'ik (a x-at-oq'ik) "Did you cry?"