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## LINGUISTIC AND CULTURAL ASPECTS OF SIMPLICITY AND COMPLEXITY IN INUKTITUT CHILD DIRECTED SPEECH

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Speech addressed to children has been referred to as a simplified register of talk, characterized by syntactic and phonological simplicity, limited vocabulary, and reduced propositional complexity (Ferguson, 1978; Snow & Ferguson, 1977; Snow, 1995). In other words, child directed speech (CDS) is seen as presenting the child with a specially fashioned corpus that supposedly renders the learning task less complex. In this paper, we investigate the relative complexity and simplicity of a particular facet of child directed speech, a special lexicon of baby words. The lexicon of baby words (*piarajausiit*) that we report on is addressed to young Inuit children who are learning Inuktitut in Nunavik or Arctic Quebec.

Baby word lexicons have been described for a number of linguistic and cultural groups. In Charles Ferguson's (1978) early report on the features of CDS in 27 language groups, 24 of them used some form of baby word lexicon for children. Additional reports on child-caregiver discourse in other languages, including Huli (Goldman, 1987), Quiche Mayan (Pye, 1986), Nootka (Kess & Kess, 1986), Cocopa (Crawford, 1978), and Pomo (Oswalt, 1976), among others, describe in some detail special lexicons for children. Each of these lexicons has special properties including such things as onomatopoeic derivations, reduplicative (CVCV) formations, phonological simplifications of the adult vocabulary, particular circumstances for use of the lexicon, and even analogic renamings. However, it is not evident from these reports whether special lexicons of baby words render the child's learning task more simple.

The questions motivating our study of *piarajausiit* or the baby word lexicon in Inuktitut, then, focus on the ways in which a special vocabulary for early language learners provides them with relative simplicity or complexity of input and how the simplicity and complexity relate not only to the particular language the children are learning, but also to the cultural framework in which they learn it. These questions are rooted in the ongoing pursuit of understanding the universal and varied qualities of input to and acquisition of children's language.

### Structure of Inuktitut

Inuktitut is a language of the Eskimo-Aleut family spoken in arctic Quebec in Canada, and is still acquired as a first language in the home by virtually all Inuit children in this area. Inuktitut is a polysynthetic language, morphologically ergative,

with prolific nominal ellipsis and complex morphology. Words begin with root morphemes of a number of classes including nominals, verbals, locationals and particles. These root morphemes may have as many as 8 or 10 affixes attached to them, including obligatory verbal and nominal inflectional affixes<sup>1</sup>. Note that the most common nominal case inflection, absolutive singular, is phonetically null, and thus nominal roots in may appear seemingly without inflection.

One main focus of this paper is the affixation used in child directed speech. The examples below illustrate both simple (a) and complex (b) affixation on both verbal (1) and nominal (2) roots. Note that the relevant roots are underlined in these and following examples.

- (1) a. *Pisuktuq.*  
pisuk-juq  
 walk-PAR.3sS<sup>2</sup>  
 'He/she/it walks.'
- b. *Annuraarsimalukatsitipaujaalumijuq.*  
annuraaq-sima-lukat-siti-paujaaluk-u-mi-juq  
 dress-PERF-often-well-EMPH-be-also-PAR.3sS  
 'He/she/it also often dresses up very unusually.'
- (2) a. *Aluuraaluk.*  
aluu-aluk  
 white.person-mean  
 'Mean white person.'
- b. *Quttukallakutaatsiaraapimmut.*  
quttuq-kallaq-kutaaq-tsiaq-apik-mut  
 one.who.is.funny-cute-tall-handsome-nice-ALL.SG  
 'By a nice tall handsome cute funny person.'

In (1a) the verbal root *pisuk*- 'walk' has one 3rd person singular inflection, whereas the verbal root *annuraaq*- 'dress' in (1b) has a number of affixes ending with a third person singular inflection. In (2a) the nominal root *aluu* 'white person' has one affix, whereas in (2b) there are a total of five affixes on the nominal root *quttuq* 'one.who is funny'.

### Inuktitut baby lexicon

As noted above, Inuktitut has a special lexicon of baby words comprised almost only of verbal and nominal roots. These baby roots are used in language to and by children under the age of 3;0, and are replaced by the appropriate adult roots sometime around the child's third birthday. The lexicon is quite standard across the families and communities of Ungava Bay.

Inuktitut baby roots often use simpler, earlier learned phonemes than the

equivalent adult roots (3a,b). In some cases they derive from the adult root (3c,e), in others they do not (3a,b,d). They can be reduplicative (3c), onomatopoeic (3d), and are used more freely than adult words in different word class functions (3b,e).

(3)	Baby root	Adult root	English translation
a.	<i>maa-</i>	<i>kuni-</i>	'kiss'
b.	<i>apaapa-</i>	<i>niri-, niqi-</i>	'eat, food'
c.	<i>uuhuu-</i>	<i>unaq-</i>	'be hot'
d.	<i>vuvu-</i>	<i>nunakkuujuuq</i>	'vehicle'
e.	<i>aahaaq-</i>	<i>aanniq-</i>	'to hurt, thing that causes hurt, thing that hurts, ouch'

They include semantic areas related to body parts and function, food, people, and animals, among others.

The following examples show that this supposedly simple vocabulary of baby noun (4) and verb (5) roots can have affixation that is either simple (a) or complex (b).

- (4) a. *Qingaaluit aaqqaaraaluk.*  
 qingaaq-aluk-it aaqqaq-aluk  
 nose-EMPH-your dirt-EMPH  
 'Your nose is dirty.'
- b. *Ihiiruluk aaqqaaraaluturumasuuraalummat.*  
 ihiiq-guluk aaqqaq-aluk-tuq-guma-suuq-aluk-u-mmat  
 yucky-bad.little dirt-EMPH-consume-want-HABIT-EMPH-be-CSV.3sS  
 'Because the little bugs bite the dirty ones.'
- (5) a. *Aataarqut.*  
aataaq-vuq  
 hurt-IND.3sS  
 'It's broken.'
- b. *Aataartaulangasijualuguna!*  
aataaq-jau-langa-si-juq-aluk-una  
 hurt-PASS-FUT-PRES-PAR.3sS-EMPH-this.one  
 'That guy is going to get hurt!'

The two longer noun and verb forms (4b, 5b) taken from our corpus of child directed speech have six and seven affixes respectively whereas the two shorter forms (4a, 5a) have one affix each. Indeed it was our first observations of the relatively high degree of affixation on baby roots that led us to query just how simple this baby word vocabulary in Inuktitut made the learning task.

### Methodology

This study investigates the relative simplicity afforded by use of a baby word lexicon in Inuktitut. Both ethnographic and linguistic methodologies were used to approach this question.

Data for the ethnographic aspect of the study are taken from interviews of Inuit women. Twenty women in two small remote communities in arctic Quebec were interviewed about child rearing, language acquisition, and language use with children. These women covered a range of ages from 18 to over 45 years and were considered by our Inuk research advisor to be in various stages of motherhood. Comments relevant to use of the baby word lexicon and child-directed speech were abstracted from the interviews.

Data for the linguistic portion of the study are taken from caregiver speech collected as part of longitudinal studies of preschool children in the same two small remote communities of arctic Quebec. Children were videotaped in their homes in naturalistic spontaneous interactions; we have reported elsewhere various aspects of the language acquisition and socialization of these children (e.g. Crago, 1988; Allen, 1996). For this study, we focused on the speech of the caregivers of three children aged 1;8 through 2;1: three mothers and one grandmother (referred to as mother 2 below). The study analysed almost 1000 utterances of directed by these caregivers to the children, as well as 100 some utterances directed by the same caregivers to adults (people of at least 13 years of age). Details are given in Table 1.

Table 1: *Details of data used*

	Age of mother	Age of child	Number of utterances	
			To child	To adult
Mother 1	57	1;8, 2;0	311	48
Mother 2	42	1;9, 2;1	150	53
Mother 3	20	1;9, 2;1	165	12
Mother 4	21	1;8	285	0

Linguistically, the question of simplicity related to a baby word lexicon was approached in two ways. First, we looked at the phonology of the baby roots used in order to determine whether the baby roots were phonologically simpler than their adult counterparts and thus easier for the child to perceive or produce. Each baby root in the caregiver data was independently rated by a speech scientist and a researcher in phonological development on grounds of phonological simplicity, length, reduplication, and relative learning time of relevant phonemes.

Second, we looked at the amount of affixation on baby roots vs. adult roots, on the hypothesis that baby roots may somehow signal a relaxation of use of affixation and

thus provide less morphologically complex input to the child. We counted the number of affixes on each verb and noun root, comparing results across baby vs. adult roots, verb vs. noun roots, adult- vs. child-directed speech, and individual differences across mothers.

### Results

Inuit mothers' descriptions of the use and utility of this lexicon, as well as the nature of child-directed speech, are quite revealing. Older women that we interviewed made comments like these:

"I use this way of talking that is more suitable for a child his age (2 years). I talk in a way not meant for an adult. The language would be too heavy if I talked to him as I would to an adult. When they are first learning to understand we should not talk in such a way to them."

"I don't talk real talk to my babies"

"When they are small, I use a special way of talking and follow his ability to recognize that special way of talking that is different from an adult."

Younger mothers, on the other hand, said quite different things when they expressed their beliefs about talking to their babies. These included the following:

"By talking to them well, not acting like a child to them."

"Just like that, using the same words. I talk to her in the same way I usually talk."

"I think that if children would be talked to plainly, as they are growing up, that they are learning to talk well by not talking baby talk to them."

Finally, a middle-aged mother's pointed comments reflect the impact of intercultural contact and cultural dominance, and may help to explain the differences in the older and younger women's expressed beliefs and why these beliefs appear to have changed over time.

"I just make my words easy, but not baby talk, using real words when I talk to my children. I used to talk the way Inuit do. Now I talk just like to an adult. I learned it from *Qallunaat* (non-Inuit). Their ways are different and they have learned and they are more educated about the child having to be talked to in real words."

These quotes indicate that Inuit mothers are aware of some level of simplification in their speech to young children. While older mothers believe this appropriate and

necessary for young children to learn language, younger mothers do not and state that they do not simplify their language. The linguistic and quantitative results below illuminate actual patterns of language use in talking to young children.

Results of our study indicate that both younger and older mothers use baby roots consistently in talking to their young children. In fact, about 30% of the total noun and verb roots used in child-directed speech are baby roots, compared with about 0% baby roots in adult-directed speech, as shown in Table 2. The few baby roots occurring in adult-directed (AA) speech were used to convey something about the child (for instance, concerning his bottle) to another adult.

Table 2: *Baby roots as a percentage of total roots*

	Mother	To child		To adult	
		Verb root	Noun root	Verb root	Noun root
Older	1	31%	40%	0%	0%
	2	16%	14%	0%	2%
	Mean	23%	27%	0%	1%
Younger	3	38%	30%	0%	0%
	4	36%	29%	--	--
	Mean	37%	29%	0%	0%
Total		30%	28%	0%	1%

Baby roots, therefore, do not comprise the only roots used with children but they are, nevertheless, a substantial portion of roots used in speech addressed to children. Note that the younger mothers actually used approximately the same percentage of baby words as one of the older mothers. In fact, the smallest percentage of use of baby words was for one of the older mothers. This finding points out the importance of both behavioural and conceptual data in the understanding of caregiver-child interactions.

Our first test of simplification involved assessing the baby roots used to determine if they constitute phonologically or otherwise simpler forms than their adult equivalents. A full list of the 12 baby noun roots and 23 baby verb roots that were used by the four caregivers are given in (6) and (7) respectively, with their adult equivalents and English translations.

(6)	<u>Baby root</u>	<u>Adult root</u>	<u>English translation</u>
a.	<i>aahaag</i>	<i>aanniq-naq-tuq</i>	'dangerous thing'
b.	<i>aaqqaag</i>	<i>ipiq</i>	'dirt'
c.	<i>aluu</i>	<i>qallunaaq</i>	'white person'

d.	<i>ammu</i>	<i>illi</i>	'bed'
e.	<i>apaa</i>	<i>annuraaq</i>	'clothes'
f.	<i>apaapa</i>	<i>niqu</i>	'food'
g.	<i>ihiiq</i>	<i>irsi-naq-tuq</i>	'scary thing'
h.	<i>lulu</i>	<i>qimmiq</i>	'dog'
i.	<i>piipi</i>	<i>piaraq</i>	'baby'
j.	<i>piupuu</i>	<i>piu-juq</i>	'nice thing'
k.	<i>uquuqu</i>	<i>umajuq</i>	'animal'
l.	<i>vuvu</i>	<i>nunakkuujuuq</i>	'vehicle'

(7)	<u>Baby root</u>	<u>Adult root</u>	<u>English translation</u>
a.	<i>aahaag-</i>	<i>aanniq-</i>	'hurt'
b.	<i>aaqqaag-</i>	<i>ipiq-</i>	'be dirty'
c.	<i>aataag-</i>	<i>aanniq-</i>	'hurt'
d.	<i>aimi-</i>	<i>tutsiaq-</i>	'pray'
e.	<i>ammu-</i>	<i>sinik-</i>	'sleep'
f.	<i>anga-</i>	<i>piu-</i>	'be nice'
g.	<i>apaa-</i>	<i>annuraaq-</i>	'dress'
h.	<i>apaapa-</i>	<i>niri-</i>	'eat'
i.	<i>apuuq-</i>	<i>pitaiq-</i>	'be gone'
j.	<i>atai-</i>	<i>ani-</i>	'go out'
k.	<i>auvaaq-</i>	<i>aunaaq-</i>	'bleed'
l.	<i>ihiiq-</i>	<i>irsi-naq-</i>	'be scary'
m.	<i>maa-</i>	<i>kuni-</i>	'kiss'
n.	<i>miiq-</i>	<i>patitta-</i>	'hit'
o.	<i>nangiiq-</i>	<i>ijukkaq-</i>	'fall'
p.	<i>paapai-</i>	<i>ani-</i>	'go out'
q.	<i>paapuu-</i>	<i>anaq-</i>	'defecate'
r.	<i>pipiq-</i>	<i>aanniq-</i>	'hurt'
s.	<i>piupuu</i>	<i>piu-</i>	'be nice'
t.	<i>puu-</i>	<i>aqi-/aargik-</i>	'soothe'
u.	<i>uppaq</i>	<i>atsuruq-</i>	'pull hard'
v.	<i>uuhuuq-</i>	<i>unaq-</i>	'be hot'
w.	<i>vuvu-</i>	<i>nunakkuujuuq-</i>	'drive vehicle'

These lists were rated independently by a speech scientist and a researcher in phonological development as to phonological simplicity of the baby roots relative to the equivalent adult roots. Well over half the roots, but by no means all of them, were considered to be either simpler (phonologically, in length, or by reduplication) or to contain phonemes that were learned earlier by children. Thus, the forms of the baby roots themselves play some part in simplification, but this does not seem to be their sole purpose.

Our second test of simplification involved assessing the amount of affixation on

baby roots relative to adult roots. As noted above, baby roots in Inuktitut may be affixed with all the same affixes as adult roots. However, it is possible that the presence of a baby root lexicon offers to the adult a set of roots which do not need to be affixed in the same way as adult roots. To address this question, we contrast the affixation on baby roots directed to children (BC), adult roots directed to children (AC), and adult roots directed to adults (AA). In addition we contrast the younger mothers to the older mothers to see if their speaking behaviours bear out the expressed beliefs of their age group.

Figure 1 indicates that while virtually all verb and noun roots are affixed in adult-directed speech (AA), only 90% of verb roots (both adult (AC) baby (BC)) and 70% of noun roots are affixed in child-directed speech. This means that relatively few bare roots are used with children and, in turn, we find that Inuktitut-speaking children use fewer bare roots and inflect their language much earlier than has been reported for children speaking other languages (Crago, Allen, Hough-Eyamie, in press; Crago, Allen & Genesee, 1996). Slightly fewer baby roots than adult roots directed to children are affixed in our sample of child-directed speech. In this sense, child-directed utterances containing baby roots could be considered slightly less complicated than those containing adult roots. Overall, a smaller percentage of the roots are affixed in child-directed speech than in adult-directed speech.

Figures 2 and 3 show individual variation in both the young and old mothers. Figure 2 indicates patterns for verb roots in child-directed speech. Mothers 2 and 3 use almost no bare verb roots of either the baby (BC) or adult (AC) varieties. Mothers 1 and 4 inflect baby (BC) verb roots less than they inflect adult (AC) verb roots. Figure 3 illustrates a somewhat different pattern for noun roots. In the case of mothers 2 and 4, there is little or no difference between the affixation of baby (BC) noun roots and adult (AC) noun roots directed. Mother 1 inflected more baby (BC) noun roots than adult (AC) noun roots, while mother 3 showed the opposite pattern.

A further comparison helps to clarify the extent of affixation in child- and adult-directed speech. Figure 4 contrasts child-directed and adult-directed speech with regard to the mean number of affixes per baby and adult roots. Not surprisingly, adult-directed adult (AA) verb and noun roots are more highly affixed than child-directed adult (AC) roots which are in turn more highly affixed than baby (BC) roots.

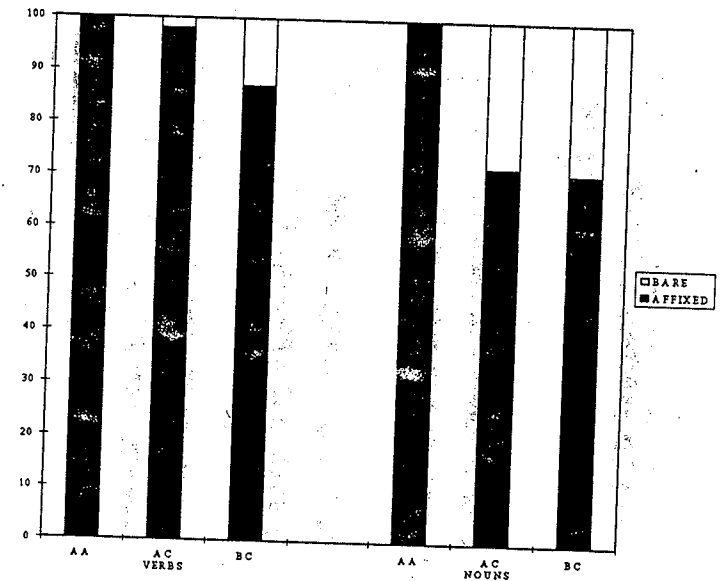


Figure 1: Total percentage of verb and noun roots with and without affixes or inflections

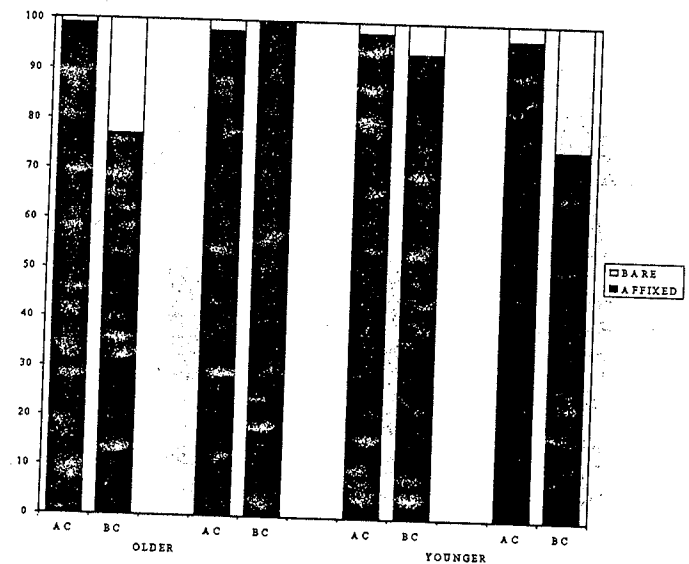


Figure 2: Percentage of baby and adult verb roots with affixes, by mother

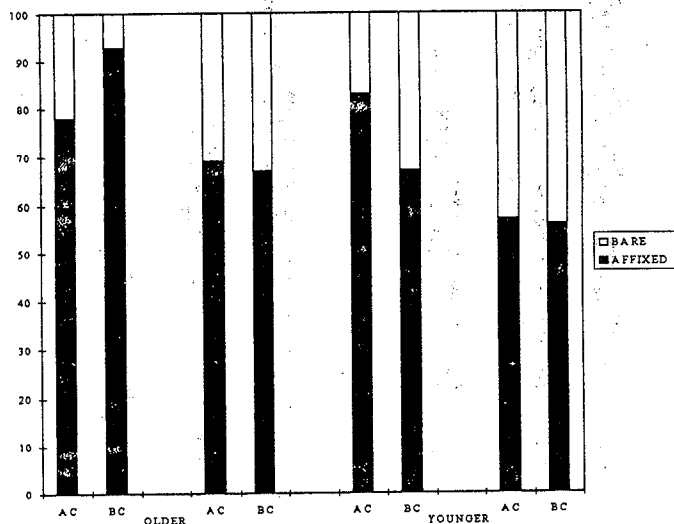


Figure 3: Percentage of baby and adult noun roots with affixes, by mother

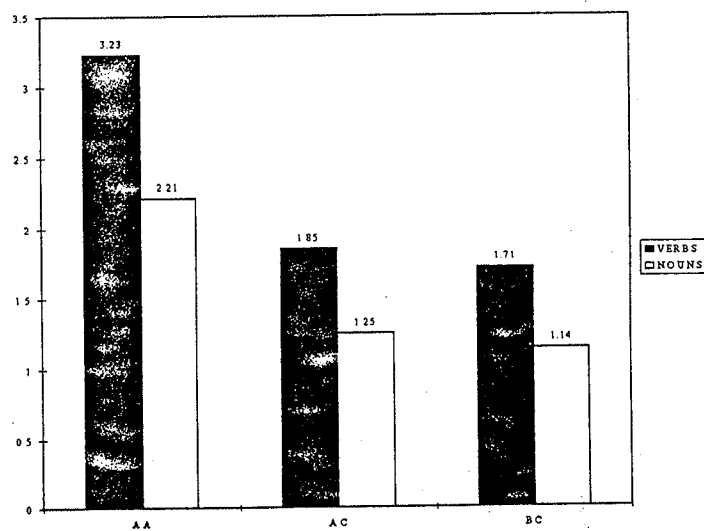


Figure 4: Mean number of affixes per root

### Discussion and conclusion

In conclusion, the relative simplicity and complexity of these *piarajausiit* or Inuktitut baby words is not entirely straightforward. Indeed, many baby words involve phonological simplification but not all of them. Both baby roots and adult roots are simpler in terms of affixing morphology in child-directed speech than in adult-directed speech. On the other hand, baby words can and frequently do have quite complex morphology affixed to them. In that sense, they mirror the morphological complexity of the adult target language. Unfortunately, at present, there is not any equivalent affixational data concerning baby word lexicons in other languages with which to compare our findings. However, it appears more than likely to us that not all baby word lexicons nor indeed all adult input would be as highly affixed as this Inuktitut baby word lexicon is. Its potential complexity relative to other languages is undoubtedly linked to the typology of the language of which it is a part. This morphologically complex form of child-directed speech could well be considered an appropriate learning corpus for a child acquiring Inuktitut. Curiously, however, the morphology on baby words themselves is only slightly less complex than on the adult forms that make up two thirds of child-directed speech. Moreover, this baby word lexicon requires children to double their lexical learning load. Baby words must be learned and then discarded in favour of a supplementary adult lexicon, and all within the first three years of a child's life. Thus, it is clear that simplification is not the only factor relevant in use of the baby word lexicon in Inuktitut.

Why else, then, might caregivers use such a lexicon? We would like to posit that in addition to their somewhat simplified phonology and morphology, baby words taken together with a number of other features of communication directed to Inuit children, too lengthy to describe in this paper, are a part of the language socialization practices that index the social status of the child relative to the adult. Studies of baby word lexicons in other languages have stressed their importance for expressing affection (as in Nootka speakers) and learning culturally patterned ways of thinking (as in analogous renamings of Huli speakers) rather than for necessarily simplifying the language learning task.

It appears to us from this preliminary analysis, that the whole story of a baby word lexicon does not lie in its complete simplicity. In fact, this lexicon is reasonably complex from the point of view of language learning, making it similar to the kinds of complexities that Catherine Snow (1995) has recently pointed out about certain other features of child-directed speech. We believe, then, that ongoing cross linguistic work on input to children (e.g. Lieven, 1994) will be enriched by considering not only issues of simplicity but also those of complexity.

### Endnotes

1. We leave aside the question of whether words are actually formed in Inuktitut by affixation, incorporation, or some other mechanism.

2. The following abbreviations are used in glosses: ALL - allative case; CSV - causative modality; EMPH - emphatic; FUT - future; HABIT - habitual; IND - indicative modality; PAR - participative modality; PASS - passive; PERF - perfective; PRES - present; SG - singular; 3sS - third person singular subject.

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## Syntactic development in children with hemispherectomy: The Infl-System

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### 1. Introduction

Linguistic theory, acquisition theory, and neurolinguistic theory are concerned with determining the characteristics and properties of the human biological endowment for grammar and grammar acquisition. In this paper we will examine one aspect of grammatical development in children who have undergone hemispherectomy to control intractable epilepsy. Our objective is to investigate language development in children who have undergone hemispherectomy, the removal of one hemisphere of the brain, as a way to gain insight into the potential of each cortical hemisphere to subserve grammatical development. A second objective is to provide evidence regarding whether and/or when their grammars include functional categories.

The focus of this paper is the functional category INFL, which stands for 'inflection', and subcategories of INFL, or I, for short. We will examine whether and how the grammars of children who have undergone right or left hemispherectomy embody the I-system. Note that after a left hemispherectomy a person has only a right hemisphere, and after a right hemispherectomy a person has only a left hemisphere.

There are thus two main objectives, and two related sets of issues involved in this work: the neurolinguistic questions regarding the capacity of each hemisphere to subserve grammatical development and the theoretical acquisition issues regarding the principles operative in grammatical development. Specifically, we refer to whether the functional category systems are part of Universal Grammar and therefore are part of every natural grammar, child or adult. Let us first turn to the neurolinguistic questions and issues.

### 2. Neurolinguistic questions and issues

There is an enormous literature pertinent to the linguistic and neurolinguistic issues at play which for the sake of time we summarize here in only the broadest strokes. The literature on the representation and processing of grammar in the adult brain paints a rather consistent picture. Whether considering clinical or experimental, including imaging studies of spoken or signed language, it is the left cerebral hemisphere that is specialized for the representation and processing of grammar in the adult. Indeed, neurobiological and neuroanatomical evidence, even during gestation, support the position that the left hemisphere is "prepotent", preprogrammed, as it were, to mediate grammar and its development.