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The acquisition of polysynthesis*

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ABSTRACT

Polysynthetic languages can present special extraction puzzles to children, due to the length of their words. A number of hypotheses concerning children's strategies for acquiring morphology, originally proposed on the basis of their approaches to somewhat simpler systems, are confirmed by observations of five children acquiring Mohawk. Among the Mohawk children, the earliest segmentation of words was phonological rather than morphological: stressed syllables, usually penultimate or antepenultimate, were extracted first. Ultimate syllables were then added, confirming the salience of the ends of words. During this time, distinctions expressed by adults in affixes were either omitted or expressed analytically. Acquisition then moved leftward by syllables. When most utterances were long enough to include pronominal prefixes as well as roots, morphological structure was apparently discovered. It is not surprising that the pronouns should trigger this awareness, since they are frequent, appearing with every verb and most nouns, they are functional, and they are semantically transparent. From this point on, the children acquired affixes primarily according to their utility and semantic transparency rather than their phonological shape or position.

INTRODUCTION

A major variable in language acquisition is the structure of the language being acquired. Peters (1981, 1983, 1985) has pointed out the special importance of certain structural features in children's earliest analyses of

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language. Faced with a continuous stream of speech, the child must first solve the 'initial extraction problem', learning to recognize and remember recurring chunks of speech. Polysynthetic languages, those with many morphemes per word, present special extraction puzzles due to the length of their words. Once chunks have been extracted, the child must begin to segment them into smaller meaningful units. The complex morphological structures of polysynthetic languages present a special challenge here as well.

Opportunities for observing the acquisition of polysynthetic languages are diminishing rapidly. A century ago, hundreds of polysynthetic languages were being acquired by children in North America alone. Today, less than a dozen of these are still being learned as first languages. Similar situations exist in many other parts of the world. There is much to discover and little time.

A language that should present particular challenges to early learners is Mohawk, an Iroquoian language spoken primarily in Quebec, Ontario and New York State. It is highly polysynthetic, with extensive prefixation, suffixation and noun incorporation. Noun and verb roots are bound: they never occur without prefixes and suffixes. Speakers cannot produce most morphemes in isolation even if they try, so children never hear bare roots. Adults cannot normally recognize isolated morphemes, so if young children were to produce them, they would not usually be understood. The language is also relatively fusional. Adjacent morphemes often coalesce, and individual morphemes can exhibit up to four or five different shapes depending on context.

Mohawk is still spoken magnificently by adults of grandparent age, but few children are currently acquiring it as a first language. The rare ones who have begun to learn it recently have generally stopped using it as soon as they encountered English-speaking peers. Beyond a study of one child by Feuer (1980), there has been little opportunity to discover how children initially break into a system with this degree of morphological complexity, and how they first go about discovering its structure. The fortuitous observation of several children at various stages in their acquisition of Mohawk morphology, however, has permitted some additional evidence of principles underlying their approaches to polysynthesis.

Overview of Mohawk morphological structure

There are three morphological types of words in Mohawk: particles, nouns and verbs. Particles are by definition morphologically unanalysable, although they are sometimes compounded. They function as numbers (*áhsen* 'three'), demonstratives (*kí:ken* 'this'), certain kinds of adverbials (*sótsi* 'too'), emphatic/contrastive pronouns (*i : i* 'I, myself'), interrogative and relative pronouns (*oniha* 'who ?'), conjunctions (*tánon* 'and'), evidentials (*ia : ken* 'it

is said'), etc. (The transcription used here is that in use in the Mohawk community at Caughnawaga, Quebec. Before consonants, the orthographic sequence *en* represents the vowel *ʌ*, and *on* represents the vowel *ʊ*. Before vowels, *i* represents the glide *y*. Apostrophe (') represents glottal stop, acute accent (') stress with high or rising tone, grave accent (") stress with falling tone, and colon (:) vowel length. Obstruents are automatically voiced before sonorants.)

Nouns. Regular morphological nouns consist minimally of a pronominal prefix indicating the number and gender of the referent (or its possessor), a noun root, and a nominal suffix. (Hyphens indicate morpheme boundaries.)

- (1) *ka-hná :w-a'*

NEUTER.SINGULAR. PATIENT-rapids-NOMINAL.SUFFIX
'current, rapids'

- (2) *ak-hná :t-a'*

I.SINGULAR.PATIENT-bag-NOMINAL.SUFFIX
'my purse'

A number of derivational suffixes may be added to nominals. A pervasive one is the locative *-ke/-ne* 'at/to/in(to)/on(to)'.

- (3) *ka-hnaw-à :-ke*

NEUTER.SINGULAR.AGENT-rapids-NOMINAL.SUFFIX-LOCATIVE
'at the rapids' = 'Caughnawaga' (a place name)

- (4) *ra-'nionhs-à :-ke*

MASCULINE.SINGULAR.AGENT-nose-NOMINAL.SUFFIX-LOCATIVE
'on his nose'

(Glottal stops closing stressed syllables are automatically replaced by vowel length and falling tone.)

Other derivational suffixes can also be added to nominals, including a typicalizer ('genuine, original, real'), a customary ('in the style or language of N'), a populative ('the people of N'), an augmentative, a distributive pluralizer, and a decessive ('the late or former N'): *ka-hnaw-a'-ke-hronon'-kenha* 'the late Caughnawan'.

Nouns referring to human beings can be marked for number by the pronominal prefixes, but number is usually unmarked otherwise. Nouns are not inflected for case. (Pronominal prefixes on nouns appear in agent and patient forms, but these do not reflect their syntactic roles within the clause.)

Verbs. The morphological structure of verbs can be considerably more complex than that of nouns. All Mohawk verbs contain at least a pronominal prefix, a verb root and an aspect suffix.

(5) *ro-tà : -on*MASCULINE.SINGULAR.PATIENT-sleep-STATIVE.ASPECT
'he is sleeping'

The pronominal prefixes are not agreement markers: they are referential pronouns in their own right. A verb like that in (5) thus constitutes a full grammatical clause. There are approximately 60 different pronominal prefixes in Mohawk, each varying in shape according to context. There is a set of prefixes used for agents ('he left'), a set for patients ('he was sleeping'), and a transitive set for combinations of agents and patients ('I kicked him'). Singular, dual and plural numbers are distinguished, inclusive ('you and I') versus exclusive ('he/she/they and I') first persons, and masculine, feminine-indefinite and neuter-zoic third persons.

Four basic aspects are distinguished: imperative, habitual, punctual and stative. Their forms are not usually predictable.

In addition to the pronominal and aspect markers, verbs may contain a number of other affixes. They may also include an incorporated noun stem. The full set of possibilities is arrayed in Table 1 in their order of occurrence. A few affixes never co-occur, such as the translocative, indicating motion away from the speaker, and the cislocative, indicating motion toward the speaker. Verbs containing large numbers of morphemes are not unusual, however.

Verbs occur much more frequently than nouns in normal Mohawk discourse. The predicate:nominal ratio in adult spoken Mohawk discourse is often around 5:1. Comparable figures in spoken English generally range around 1:2 or 1:3 (Chafe, personal communication). Furthermore, verbs function not only as predicates, but also as complete clauses (he-sleep-s = 'he is sleeping'), as adverbials (it-fast-is he-run-s = 'he runs fast'), and as nominals (it-fie-s = 'aeroplane'). The verbal morphology is highly productive and heavily used. Children must learn a fairly elaborate morphological system for even rudimentary communication, but they are heavily exposed to it.

Peters (1983) has hypothesized that if morphemes in a language exhibit regular canonical shapes, particularly if these correspond to syllables, the early segmentation process should be easier. Mohawk exhibits regular canonical shapes for neither roots nor affixes. Morphemes may consist of single consonants, like roots *-k-* 'eat' and *-t-* 'stand' or affixes *n-* partitive and *-* punctual aspect. They may consist of single vowels, like roots *-o-* 'be in water' and *-e-* 'go' or affixes *en-* (*λ-*) future tense and *-on* (*ü-*) stative aspect. They may consist of integral syllables. They often consist of sequences that spread across parts of several syllables, like roots *-kst-* 'be heavy' and *-nikonhr-* 'mind' or affixes *-t-* causative and *-hkw-* instrumental. Fusion is not uncommon. The sequence *wa' + w + a* (PAST + NEUTER AGENT

TABLE I. *The morphological structure of the Mohawk verb*

FRT	TRANS	PAST	DU	FUT	REP	PRO	RFL	NOUN	VERB	→
EDIN	EDNTR	NEG		OPT	CIS		SRF	ROOT	ROOT	→
										→
										→
REV	CAUS	INST	DAT	DIST	DISL	HAB	FORMER PAST			
INCH										

Abbreviations:

FRT	partitive	REP	repetitive	DAT	dative
EDIN	coincident	CIS	cislocative	DIST	distributive
EDNTR	contrastive	PRO	pronoun	DISL	dislocative
NEG	negative	RFL	reflexive	HAB	habitual aspect
TRANS	translocative	SRF	semi-reflexive	STAT	stative aspect
PAST	past tense	REV	reversive	PUNC	punctual aspect
DU	dualic	INCH	inchoative	CONT	continuative
FUT	future tense	CAUS	causative	PROG	progressive
OPT	optative	INST	instrumental		

Additional abbreviations in text:

1	first person	M	masculine	SG	singular
2	second person	F	feminine-	DU	dual
3	third person	I	indefinite	PL	plural
IN	inclusive	N	neuter-zoic	AGT	agent
EX	exclusive			PAT	patient

PRONOUN + a), for example, yields a single nasalized vowel *on* (*ü*). The initial task of breaking into the morphological system is thus not facilitated by the shapes of morphemes.

THE ACQUISITION OF POLYSYNTHESIS

Much could be learned about the acquisition of complex morphological structure from detailed longitudinal studies of a variety of children. Unfortunately, such studies of Mohawk are now rarely possible. A comparison of the speech of five children at different points in their linguistic de-

velopment has revealed some general principles, however. Many of these match those proposed by Peters (1983, 1985), Slobin (1973, 1985) and others, based on observations of children learning somewhat simpler morphological systems. A number support hypotheses that have necessarily been tentative in the absence of more documentation of children acquiring more complex systems.

One might wonder to what extent caretakers assist children in acquiring polysynthetic languages by simplifying their speech. None of the adults playing with the children observed here, including mothers and grandmothers, seemed to alter the complexity of their Mohawk for the benefit of the children. All spoke at a normal, rapid rate of speed. Their pronunciation was clear, as is normally the case, but no phonological processes were undone. The same predominance of verbs prevailed in their speech to children as to other adults, and the same elaborate prefixation, suffixation and noun incorporation were used. There was much animated interaction but little correction, repetition or expansion. These children were clearly appreciated as conversational partners, but they were not receiving predigested speech.

Child I: phonologically defined limitations on utterance length. Peters (1985) has hypothesized that in heavily fusional languages, segmentation will tend to occur at first along syllabic rather than morpheme boundaries. Such features as intonation, rhythm and stress will increase the salience of particular syllables and prompt their extraction and segmentation. The speech of the youngest child observed provides good evidence of the importance of these features.

Child I was a foundling left on the doorstep of a Mohawk language teacher who was participating in an intensive course on Iroquoian linguistics. The child appeared to be approximately 1;9, to have been abused and to have no language whatsoever. She spent 8–10 hours with the class every day during the remaining four weeks of the course. The ten other participants in the course were all grandparents who spoke to her only in Mohawk, their first language. She spent the day moving from one lap to another, picnicking and playing happily with the group outdoors. Everyone eagerly observed her language emerge, and a written record was kept of her progress.

The earliest meaningful utterances produced by this child were of one syllable in length. The syllable chosen was always the one stressed in adult speech.

(6) *ti'* Adult: *satíta* 'get in!'

(7) *ki:(r)* Adult: *shnekì:ra* 'drink!'

The same strategy was observed by Pye (1983) among children learning Quiché Mayan.

Word stress in Mohawk is basically penultimate, falling on the next to the last syllable. Certain consonant clusters are not permitted in the language; when these would occur, epenthetic vowels are inserted to separate the consonants. The epenthetic vowels do not enter into the determination of stress, so stress sometimes actually appears on the antepenultimate or even preantepenultimate syllable. In such situations, the child consistently chose the stressed syllable, regardless of its position within the word. (Both *e's* of 'apple' are epenthetic.)

(8) *io:* Adult: *sewahíó:wane'* 'apple'

Stressed syllables are accompanied by other features of intonation and rhythm. Mohawk is a pitch-accent language; stressed syllables exhibit contrastive high, rising or falling tone. Posttonic syllables are usually lower in pitch than others. Open stressed syllables are long. Stressed syllables are thus salient not only for their increased volume, but also for their special pitch contours and often for their length.

The choice of the stressed syllable usually provides a semantic advantage in Mohawk. The morphological structure of both nouns and verbs is such that stress is most likely to fall somewhere on the root or stem. Note the structures of (6), (7) and (8).

(6) *saTÍta* stem: *-atíta*

s-at-ítá

2.SINGULAR.AGENT-SEMI.REFLEXIVE-be.in(-IMPERATIVE)

'get in!'

(7) *shneKÌ:ra* stem: *-hnekihra*

s-hnek-ihra

2.SINGULAR.AGENT-liquid-consume(-IMPERATIVE)

'drink!'

(8) *sewahíO:wane'* stem: *-ahiowan'*

s-w-ahi-owan'

REPETITIVE-NEUTER.SINGULAR.AGENT-fruit-large-STATIVE

'apple'

The child consistently selected the stressed syllable whether it coincided with a portion of the stem or not.

The emergence of language in this youngest child provides good evidence for hypotheses proposed by Peters (1985). The choice of the first units pronounced was phonologically rather than morphologically motivated. The child consistently chose single, intonationally salient, stressed syllables, whatever their position within the word.

Child II: increased word length and the emergence of two-word constructions. Slobin (1973, 1985) and Peters (1983, 1985) have proposed that children pay special attention to the ends of words. Evidence of this principle is provided by the speech of a child observed at age 2;4. Her speech was taperecorded for an afternoon by a Mohawk-speaking friend as she played in her home with her mother and her aunt. Her family had made special efforts to expose her only to Mohawk, although they were bilingual in English. She knew some English, but spoke only Mohawk during the afternoon.

This child also exhibited a phonological restriction on the maximum length of words. Her words consisted for the most part of the stressed syllable of adult words plus the following ultimate syllable.

- (9) *tá:ti* Adult: *satá:ti* 'talk!'
- (10) *Hò:ten?* Adult: *nahò:ten?* 'what?'

When stress was antepenultimate, her words consisted of the stressed syllable plus one or both of the following syllables.

- (11) *io:wana* Adult: *sewahio:wane* 'apple'
- (12) *wáest* Adult: *wákeras* 'it stinks'
- (13) *ente'ne'* Adult: *entene* 'let's go'

The limitation on word length was still phonological rather than morphological. Her chunks correspond to syllables, not morphemes.

- (9) *tá:ti*
s-atati stem: *-atati*
2.SINGULAR.AGENT-SEMI.REFLEXIVE-talk(-IMPERATIVE)
'talk!'
- (12) *wáest*
w-akr-as stem: *-akr-*
N.SINGULAR.AGENT-stink-HABITUAL
'it stinks'

MacWhinney (1985, 1120) has noted that 'in early combinations, children will tend to order the newest or most informative element first'. This is actually the principle underlying constituent ordering in adult Mohawk (Mithun 1987). This second child had begun to form two-word constructions, all of which corresponded to this principle.

- (14) *Máma ò:ni* = Adult
'Mama too'
- (15) *Keñ:en tá:ti* Adult: *Keñ:en satá:ti*
'here talk' 'talk here (into the mike)'
- (16) *Hò:ten ki:ken?* Adult: *Nahò:ten ki:ken?*
'what this?' 'what's this?'

Distinctions expressed by affixes in adult Mohawk were either unexpressed by this child or expressed analytically with separate particles that are used by adults for focus, emphasis or contrast. In adult speech, all verbs carry pronominal prefixes referring to their agents and/or patients. This second child usually used either a constant second person singular command or a first person singular verb for all persons whenever a full verb was used.

- (17) *Máma iáhten té:kehr* Adult: *Máma iah té:ienhre'*
Mama not do-I-want Mama not does-she-want
'Mama doesn't want it'

The child used the emphatic negative particle *iáhten* 'absolutely not' (above) where an adult would have used the basic negative *iah*. This corresponds to Slobin's observation that children often use more explicit forms than adults do, marking a notion 'with as much acoustic substance as possible' (1985: 1203).

The speech of this second child thus shows the salience of word-final syllables, although word-final position does not take precedence over stress. (The speech of the boy observed by Feuer (1980) at age 2;10 exhibits the same principles.) Child II's speech also shows appropriate discourse-based word ordering and a preference for maximal acoustic substance. Her language during the afternoon she was observed indicated no awareness of morphological structure.

Child III: the development of the pronominal system. Evidence for a number of principles proposed by Peters and Slobin can be observed in the first discovery of Mohawk morphological structure. The third child was observed at the age of 2;9. Her parents spoke to her only in Mohawk, but they were bilingual and she knew some English herself. Her speech was taperecorded during one day as she played in a comfortable elementary school classroom with a group of twelve Mohawk-speaking adults including her mother. She conversed with individuals and participated in activities with the group.

Child III's words showed an increase in length over those of the younger children. She had begun to add pretonic syllables to her words. This leftward increase was crucial. The morphemes immediately preceding noun and verb stems are the pronominal prefixes, so most of her noun and verb forms now contained pronouns, often in initial position. Pronominal prefixes recur frequently in adult speech, since they are obligatory on every noun and verb. They are also transparent and important semantically, since most clauses contain no other indication of primary arguments. Not surprisingly, the child had discovered morphological structure at this point.

She had begun to construct a pronominal prefix system. She had already acquired first, second and third person singular agent and patient pronominal

prefixes, with the appropriate masculine, feminine and neuter gender distinctions in third person.

The pronominal prefixes on nouns and on verbs have similar but not identical forms. On nouns, agent prefixes show inalienable possession (as of body parts), while patient prefixes show alienable possession. This third child used the same forms in the same contexts as adults. Some were even used with English borrowings, but these had probably been heard from adults. The first person patient prefix, for example, is *wak-* with verbs but *ak-* with nouns.

(18) *ak-hná:ta'* 'my purse'

(19) *ak-chéckbook* 'my chequebook'

An indication of this child's awareness of the pronouns came at one point as she pronounced the feminine patient prefix that is used to show possession with nouns, *ako-* 'her', then paused and tried to think of the name of an object.

On verbs, the choice between agent and patient pronominal prefixes is for the most part semantically transparent. Verbs for 'writing, running, jumping, dancing', etc. appear with agent pronouns, while verbs for 'sleeping, smiling', and 'being happy' appear with patient pronouns. The verb for 'work', however, appears with patient pronouns in adult speech, probably because it originated as a stative. This third child used the appropriate patient pronoun when she answered a question with an echo of its verb.

(20) Adult: *Nahò:ten ro-ió't-e?*

what MASCULINE.SINGULAR.PATIENT-work-HABITUAL
'what is he working on?'

Child: *Roió'te'*
'he is working'

She later spontaneously used an agent pronoun *k-* 'I' with this verb, however, rather than the patient form *wak-*.

(21) *k-ió'te'* 'I am working' (Child)

wak-ió'te' 'I am working' (Adult)

(None of the Mohawk adults playing with her noticed this until it was pointed out, even though they were listening for departures from adult grammar.) Feuer's (1980) notes show the same form from the boy she observed at age 3;3.

A similar form may have a different explanation. Seeing a picture of an ice cream cone, child III cried out:

(22) *ké:ka's* 'I like it!'

She used the first person agent pronoun *k-* where an adult would have used

the patient pronoun *wak-*: *waké:ka's*. Children hear this verb *-eka'* 'like the taste of' often with a second person singular pronoun when given something to eat: *sé:ka's ken?* 'Do you like it?'. Now the most common form of the second person agent pronoun is *s-*, and of the patient pronoun *sa-*. In this verb, however, the *-a-* of the patient pronoun disappears before the initial *-e-* of the root (*sa+eka'+s > sé:ka's*). The patient pronoun sounds just like an agent form. The child may have concluded that the verb *-eka'* requires agent prefixes. In any case, her verbs *kió'te'* and *ké:ka's* do indicate that she was combining pronominal prefixes with verb stems creatively, not simply repeating memorized wholes.

Child III had become aware of the singular/plural number distinction in pronominal prefixes, but could not yet produce plurals. While she was playing with several adults, one pretended to go to sleep. The child ran over and shouted:

(23) *satkétsko!* = Adult

s-at-ketsko

2.SINGULAR.AGENT-SEMI.REFLEXIVE-rise(-IMPERATIVE)
'get up!'

Pleased with her success, she began ordering each person to do something different. Suddenly everyone pretended to sleep at once. Mohawk commands are obligatorily differentiated for singular, dual and plural number in the pronominal prefixes.

(24) (Adult Forms)

satkétsko 'get up' (to one person)

tsiatkétsko 'get up, you two'

sewatkétsko 'get up, you all'

As the child stood before the group, it was clear that she wished to order everyone up at once, but realized that she was not able. After some reflection, she ran to each person in turn, shouting:

(25) *satkétsko! satkétsko! satkétsko! ...*

Child IV: the refinement of the pronominal system and the emergence of tense and aspect. The speech of the fourth child indicates that once morphology has been discovered, functional principles can replace phonological principles in the building of the system. Acquisition of morphological subsystems apparently no longer advances according to the position of those systems within the word, but rather according to their communicative value. A number of the principles proposed by Slobin (1973, 1985) to underlie children's acquisition of morphological structure can be observed here. Analytic expression was preferred to synthetic form where possible. Morphemes with readily identifiable meanings were preferred to those with more

opaque functions. Morpheme order was kept constant. Clear attempts were being made to systematize word classes on a semantic basis.

This fourth child was 2;10 when observed. His mother did not speak Mohawk, but his grandmother, who lived with the two of them, spoke only Mohawk to him all day while his mother was away at work. His speech was taperecorded for two days in a comfortable elementary school classroom as he played alone with toys and talked with his grandmother and small groups of other Mohawk adults.

His speech still showed some phonological limitation on the length of new words. As with the younger children, acquisition seemed to move from right to left: syllables were omitted from the beginnings of words rather than the ends. When asked to repeat the new words like those in the (a) forms below, he gave the (b) forms.

- (26) (a) *ohiákeri* 'fruit juice'
 (b) *iákeri*

- (27) (a) *ohwihstaien* 'there is money'
 (b) *hwihstaien*

The omission of the initial syllable in (27) is interesting because the child already knew and spontaneously pronounced the word for 'money' correctly: *ohwihsta*. Other words that he already knew seemed to exhibit no phonological limitation on length.

- (28) *onekwenhtara* 'red'
 (29) *ronkwe'táksen* 'he is a bad man'

Pronominal prefixes. Although his limitation on new word length was still phonologically based, child IV clearly showed the productive use of morphology. He controlled first, second and third person singular pronouns, and masculine, feminine and neuter genders. All of the forms below correspond to those used by adults. (Refer to Table 1 for a key to abbreviations.)

(30)	<i>wa'khni:non</i>	<i>wa'ehni:non</i>
	<i>wa'-k-hninon-</i>	<i>wa'-ie-hninon-</i>
	PAST-1.SG.AGT-buy-PUNCTUAL	PAST-F.SG.AGT-buy-PUNCTUAL
	'I bought (it)'	'she bought (it)'
	<i>wahátie'</i>	<i>t:wa</i>
	<i>wa'-hra-at-ie'</i>	<i>w-a</i>
	PAST-M.SG.AGT-SRF-fly-PUNCTUAL	N.SG.AGT-be.in.STATIVE
	'he flew'	'it is inside'

He used agent and patient pronouns appropriately, including the objective form required by the verb 'work'. Most verbs in the (resultant) stative aspect require patient pronouns, and he used these appropriately as well.

The pronominal prefixes exhibit a number of morphophonemic alternations. One involving the feminine-indefinite singular pronoun can be seen in (30) above. Initial *i*- (*y*) does not appear after the past tense prefix. The child used the same form as an adult.

The masculine pronominal prefixes display a complex set of alternations, some of which the child has mastered at this point, others not. Some are the result of historical processes that can be schematized as below.

- (31) *hr > hr/ $\left\{ \begin{array}{l} \#_V \\ [+stress]_V \\ V(h)_V \\ [-high] \\ [-low] \end{array} \right\}$ ($\tilde{V}h > \tilde{V}:/_rV$)
- #hr > h/elsewhere (where hr is the masculine prefix)
 #h > θ/#_C

Child IV used the same *hr/h/r* alternations as adults.

- | | |
|-------------------------------|--------------------------------|
| (32) <i>wà:rawe'</i> | <i>wà:reke'</i> |
| <i>wa'-hra-w-</i> | <i>wa'-hra-ek-</i> |
| PAST-M.SG.AGT-arrive-PUNCTUAL | PAST-M.SG.AGT-eat-PUNCTUAL |
| 'he arrived' | 'he ate (it)' |
| <i>waháhawe</i> | <i>rotahséhton</i> |
| <i>wa'-hra-haw-</i> | <i>hro-at-ahse-ht-on</i> |
| PAST-M.SG.AGT-take-PUNCTUAL | M.SG.PAT-SRF-hide-CAUS-STATIVE |
| 'he took (it)' | 'he has hidden' |

He had begun to use masculine plural prefixes, although their forms did not always correspond exactly to those of adults.

- (33) *ati:ia'ks* Adult: *rati:ia'ks*
 'they cut (it)' *hrati-ia'k-s*
 M.PLURAL.AGENT-cut-HABITUAL

Before consonant-initial verb stems the masculine plural prefix is usually *h/rati-* in adult Mohawk, but before vowel-initial stems it has different forms. It fuses with the initial vowel of a-stem verbs to yield a nasalized vowel (*hrati+a=hron*). The child used the pre-consonantal alternant *hati-* with the a-stem verb 'eat', an indication that he had constructed it himself.

- (34) *wahatitskà:hon* Adult: *wa'thontskà:hon*
 'they (M) ate' *wa'-t-hrati-at-ska'nhon-*
 PAST-DUALIC-M.PL.AGT-SRF-eat-PUNC

His verb is not ill-formed on the surface. It would be appropriate if the stem

were *-tskan'hon*. He did have access to the basic stem shape in a command he knew well: *tesatskà :hon* 'eat!'.

This child could not yet produce first person plural forms, although he seemed to recognize the need for them. First person dual and plural agent pronouns are distinguished in Mohawk for inclusive (including the hearer) and exclusive (excluding the hearer), a fact that adds some complexity to the system. When asked questions about himself and another person or two, he would reply in the singular or with separate emphatic pronouns. When asked who had been on an outing, for example, he replied with the emphatic pronouns in (35).

- (35) *i:se' tanon i:'i*
 'you and I'

An adult would have answered with a verb containing a first person dual inclusive pronoun. The child seemed to realize this, and spent considerable time struggling to come up with an answer.

Tense and aspect. Child IV had nearly mastered the basic tense and aspect system. Mohawk has four aspect suffixes: imperative, habitual, stative, and punctual. The form of the imperative is most often \emptyset . It is the most common form heard of many verbs, and the commands the child used corresponded to those of adults. The habitual aspect indicates habitual activities as well as certain ongoing ones. The form of the suffix is *-s*, *-ha'*, *-e'*, or several other variants, the occurrence of which are not phonologically predictable. The child used the same habitual forms as adults.

- (36) *i : raks*
ra-k-s
 M.SG.AGT-eat-HABITUAL
 'he eats (it)'

(Monosyllabic verbs are not permitted in Mohawk. Verbs that would be too short are preceded by the vowel *i*- which then bears stress.)

Child IV also used stative verbs like adults. The meanings of stative verbs are somewhat idiosyncratic. Some adjectival verbs, such as 'be good' have only a stative form unless derivational affixes are added. For many others, stative forms correspond to perfects, such as 'I have danced'. For others, stative verbs indicate an ongoing activity, like 'I am singing'. For still others, stative aspect is used for both perfect and ongoing activities. The forms of the stative aspect suffix are unpredictable, so presumably they are learned with the stem. Inherent statives like 'be big' occur with agent pronouns, but many others, like 'be old' or 'eat' appear with patient pronouns.

The punctual suffix, usually a glottal stop, is now omitted utterance-finally by many speakers, although the epenthetic vowel separating it from a preceding consonant remains. This child used the same forms as adults. The punctual aspect requires one of the three prenominal tense prefixes: the past (also called the aorist or the factual), the future, or the optative (also called the indefinite). Child IV used both the past and the future like an adult.

- | | |
|-----------------------------|-------------------------------|
| (38) <i>wa'ehni':non</i> | <i>eniehni':non</i> |
| <i>wa'-ie-hninon-</i> ' | <i>en-ie-hninon-</i> ' |
| PAST-F.SG.AGT-buy-PUNCTUAL | FUTURE-F.SG.AGT-buy-PUNCTUAL |
| 'she bought (it)' | 'she will buy (it)' |
|
 |
 |
| <i>waháhawe</i> | <i>enháhawe</i> |
| <i>wa'-hra-haw-</i> ' | <i>en-hra-haw-</i> ' |
| PAST-M.SG.AGT-take-PUNCTUAL | FUTURE-M.SG.AGT-take-PUNCTUAL |
| 'he took (it)' | 'he will take (it)' |

The child used the same alternating forms of the past tense and feminine pronominal prefixes as adults. The past tense marker *wa'*- has no glottal stop before *h*. The feminine-indefinite agent pronoun *ie-* has no *i* (*y*) following the past tense.

He seemed to sense the need for the optative on several occasions, but realized that he was incapable of producing it. The optative often appears where infinitives would be used in other languages ('for her to V') or supplies the meaning 'would', 'should', 'might', etc. (39) was the beginning of a sentence that would have required an optative on the following verb.

- (39) *iah thaon : ton ... iah ... teka ...*
 'it would not be possible for... not... it...

The first verb *thaon:ton* actually contains an optative *-aon*, but this word was probably learned as a unit.

Negation. Negation in adult Mohawk is normally accomplished by a particle *iah* plus a prepronominal prefix, either the negative *te-* or the contrastive *th-*. Both prefixes appear in word-initial position. Child IV systematically let the separate particle carry the negation alone, omitting the prefixes.

Direction and location. In adult Mohawk, verbs that signify motion in a direction contain prepronominal prefixes specifying the direction. Direction away from the speaker or topic is indicated by a translocative prefix. Verbs describing events or states occurring at a significant distance can also contain translocatives. Motion toward the speaker is indicated by a cislocative prefix. Verbs describing events or states at a closer or unmarked distance can also contain cislocatives. The translocative and cislocative were conspicuously absent from the speech of this fourth child. An adult would have used translocative verbs in the contexts in (43), (44) and (45).

- (43) *enháhawe* Adult: *i-eh-háhaw-e*
i-en-hra-haw-'
 TRANS-FUT-M.SG.AGT-take-PUNCTUAL
 'he will take it there'

(44) *waháhawe* Adult: *i-aháhaw-e*
i-a'-hra-haw-'
 TRANS-PAST-M.SG.AGT-take-PUNCTUAL
 'he took it there'

(45) *wahaià :ten'ne* Adult: *i-ahaià :ten'ne*
i-a'-hra-ia't-en-'
 TRANS-PAST-M.SG.AGT-body-fall-PUNCTUAL
 'he fell in(to the water)'

When the child sensed a need for locative specification, he used separate particles.

- (46) *tho* *wà :'en*
 wa'-ie-e-'
 there PAST-FEMININE.AGENT-go-PUNCTUAL
 'she went there'

(The initial *w-* in the child's versions of (44), (45) and (46) is the regular word-initial form of the past tense morpheme.)

Repetition. This child used another prepronominal prefix with one particular verb, although it is unlikely that his usage was creative. The repetitive (*sa-/se-/s-/tsi-/ts-*) can add the meaning 'again', or 'back'. When asked where someone was, he replied like an adult:

- (47) *Sahahten̄ :ti Eddie*
s-a-hra-ahtenti-'
 REPETITIVE-PAST-MASCULINE.SINGULAR.AGENT-leave-PUNCTUAL
 'Eddie went back (home)'

The root *-ahntti* occurs relatively rarely without the repetitive, so the child, who had heard the word above quite often in this context, had probably learned it as a unit. A separate particle *shé:kon* 'again', 'still', can be used to focus on repetition, so that the need for mastering the repetitive prefix is somewhat reduced.

The dualic and partitive. Two prenominal prefixes with less transparent functions were conspicuously absent from the speech of this fourth child. One is the dualic (also called the duplicative) which occurs midway in the string of possible prenominal prefixes, after the past tense but before the future tense. In some cases its meaning is clear, indicating that objects are two in number. In others it is more opaque, often accompanying changes in state or position, but it is lexically conditioned, simply occurring with some verb roots but not with others.

This fourth child never used the dualic prefix in either situation. Enumerating two objects requires a fairly complex construction: noun stems referring to the objects are incorporated into a verb root *-ke* 'be two or more in number'. When asked how much money he had, the child replied analytically with a separate number.

Enumerating two people or animals requires the use of a classifier with dualic prefix. The child omitted the classifier.

- | | | | | | |
|--------------------|---------------|--------|---------------|-------------------------|---------------|
| (49) <i>tékeni</i> | <i>tsi'ks</i> | Adult: | <i>tékeni</i> | <i>tehniíahse</i> | <i>tsi'ks</i> |
| two | fly | | <i>tekeni</i> | <i>te-hni-iahse</i> | <i>tsi'ks</i> |
| | | | two | DUALIC-M.DU.AGT-animate | fly |
| | | | 'two flies' | | |

(This child was just learning to count and tended to answer *tékeni* 'two' to most questions about numbers.)

In cases where the function of the dualic was more opaque, he systematically omitted it.

Another abstract prefix is the partitive, which occurs word-initially. It is used with amounts, numbers above two, to cross-reference time and location in certain syntactic constructions, and with specific verbs such as 'do' and 'happen'. It yields translations like 'thus', 'so', 'such', 'how', etc. This child simply omitted the partitive.

Since the verb 'do' always requires the partitive the child would never have heard forms without it. (The initial *w-* in his verbs is part of the appropriate word-initial form of the past tense prefix.) He did repeat a verb containing the partitive, but his intonation indicated that he had misanalysed it, interpreting the unstressed particle as the pronoun *s-* 'you' and the entire verb as the stem.

- (53) Adult: *Tho se's neíhsiere*
tho se's n-en-hs-ier-
 there just PARTITIVE-FUT-2.SG.AGT-do-PUNCTUAL
 'that's how you do it'

Child: *Tho sneíhsiere*
tho s-nenhsiere
 there 2.SG.AGT-VERB STEM

This matches Peters' principle, 'use known frames as templates in attempting to segment new utterances' (Peters 1985: 1045).

Derivational suffixes. Child IV used few words containing derivational suffixes. Those that did include them had clearly been learned as lexical units. Most were names for common objects, and in many cases the roots to which they were attached do not appear without them.

- (54) *ionhsóhkwhá'*
ie-ahso-hkw-ha'
 FEMININE.SINGULAR.AGENT-colour-INSTRUMENTAL-HABITUAL
 'one uses it to colour' = 'colour crayon'

Noun incorporation. Mohawk verbs can include noun stems referring to

their patients. Child IV used several verbs containing incorporated noun stems, but these had clearly been learned as lexical units, not created.

- (55) *ronkwe'táksen*
r-onkwe't-aks-en
MASCLINE.SINGULAR.PATIENT-person-bad-STATIVE
'he is a bad man'

The root for 'person' has the unpredictable form *-onkwē't-* when incorporated, but *onkwē* when free. The verb root *-aks-* does not occur in Mohawk without an incorporated noun.

Many locative expressions result from the incorporation of patient nouns into such verbs as 'over', 'under', 'inside of', 'next to', etc. Child IV could understand such incorporations, but could not produce them. Several objects were hidden. When he was told where they were with incorporating constructions, he went straight to their hiding places. He could also hide things himself when given directions that included verbs like (56).

- (56) *o'neróhkawon*
o-'nerohk-w-k-on
 NEUTER.SINGULAR.PATIENT-box-inside-STATIVE
 'in the box'

(57) *atekhwahra'tsheró:kon*
at-khw-hra-'tshr-ok-on
 (NEUTER-)SEMI.REFLEXIVE-food-set-NOMINALIZER-under-STATIVE
 'under the table'

(The verb in (57) contains an incorporated noun stem *-ate-khw-hra-'tsher-* 'table'. This noun stem is formed from a verb *-hra-* 'set' with a semi-reflexive and an incorporated noun of its own, *-khw-* 'food', with a nominalizer *'-tshr-'*: 'what gets food set on it').

When he was asked to tell where the objects were after he had hidden them, the child could not reply. After much embarrassment, he would run to the spot, point and say:

- (58) *ken :'en!*
‘here!’

Overall, although this fourth child still retained a phonological limitation on the length of new words, he had begun to develop sets of morphological distinctions no longer according to their positions within the word, but rather according to their utility and semantic transparency. He had begun to add a plural distinction to the pronominal prefixes. He used all aspects like adults, as well as two of the tenses, the past and the future. Of the remaining distinctions, the more semantically transparent ones like negation and

direction were indicated analytically by means of separate particles. The less transparent ones like the dualic and partitive were simply omitted. Derivational suffixes and noun incorporation were present in his speech, but were not used productively.

Child V: the near perfection of productive morphology. The oldest child observed no longer seemed to be subject to the same kinds of memory limitations as the younger children. He easily produced words containing large numbers of syllables and morphemes. A few traces of an analytic strategy were still observable in his speech in areas in which he was apparently aware of morphological structures that he was unable to produce.

This child, the brother of Child II, was 4;9 at the time of the interview. His parents had gone to great pains to ensure that he heard only Mohawk, but he was already bilingual. He was taperecorded during a morning at home in conversation with a Mohawk-speaking adult friend. By this age, he had mastered singular and plural pronouns, but not yet dual. He used all of the prenominal prefixes but one. He used all aspects flawlessly, and more derivational suffixes had begun to appear in his speech.

Pronominal prefixes. Child V had an impressive mastery of much of the pronominal system. He used singular and plural agent and patient intransitive prefixes appropriately in a variety of phonological and morphological contexts. The first person plural prefixes that were beyond the grasp of child IV were used comfortably by this child.

- (59) Beach *ia'ákwe'*
i-a'-iakwa-e'
 beach TRANSLOCATIVE-PAST-1.PLURAL.EXCLUSIVE.AGENT-go-PUNC
 'we go to the beach'

He had begun to use transitive sentences.

- (60) *wahí:ken*
wa'-hi-ken'
 PAST-1.SINGULAR.AGENT/MASCULINE.SG.PATIENT-see-PUNCTUAL
 'I saw him'
- (61) *wahókwahte'* *ne kà:sere*
wa'-hro-kwaht' *ne ka-i'sre-ht*
 PAST-(N.SG.AGT)/M.SG.PAT-hit-PUNC the N.SG.AGT-drag-CAUS
 'he was hit by a car'

One transitive prefix did not match adult usage. When talking about someone's name, adults usually say 'one calls him N...', so that the pronominal prefix used is transitive, combining a feminine-indefinite agent pronoun ('one') with a patient pronoun referring to the namebearer ('him').

At one point, child V was explaining that his grandmother's name is Anna, but in Mohawk, she is called Kawiseñhawe'. An adult would have used a verb with pronominal prefix meaning 'one/her': *iontat-*. The child used a first person plural patient prefix 'us': *ionkwa-*.

- (62) *Konwenhnéha'* *né ken ne Anna*
 person-real-CUSTOMARY the just the Anna
 'in Indian, Anna,
ne se' ionkwá:iats ne Anna, Kawisenhawe'
 the just us-call-HABITUAL the Anna she-ice-carry-HABITUAL
 we call Anna Kawiseñhawe'

With an agent pronoun *iakwa-*, this verb, although unidiomatic, would mean 'we call it'. The child may have analysed the verb as a stative requiring a patient pronoun. As it is, it means 'it calls us'. The form does indicate that the child was constructing combinations of pronouns and verb stems himself.

Child V had not acquired dual number in the pronominal system although he clearly recognized this gap in his ability. The following is a response to questions about his three pet dogs. When he realized he needed a dual pronoun, he switched to English.

- (63) *Eníka 'Daisy' Papa en..., wahário'*
 one Daisy Papa he killed (it)
tanón raostór tékeni...um...wa'-...
 and his-store two (PAST)
tékeni they're still alive
 two

The child was clearly uncomfortable at this point, fully aware that he needed a form he could not produce. His difficulty is perhaps more significant because he was one of two children, so that the use of dual forms should not have been especially rare in his home.

Tense and aspect. Child V had mastered all three tense prefixes, the past, future, and even the optative, which had been beyond the grasp of child IV.

- (64) *iah tha:iekwé:ni'* *a:ionta:wen*
iah th-aa-ie-kweni' *aa-ie-at-awen*
 not CONTR-OPT-F.SG.AGT-can-PUNC
 OPT-F.SG.AGT-SRF-bathe.PUNCTUAL
 'she can't swim'

He used appropriate forms of all tenses, even the highly fused ones.

- (65) *onkwa'tarihen*
wa'-wak-a'tarih-en
 PAST-I.SINGULAR.PATIENT-hot-INCHOATIVE
 'I got hot'

Negation. As noted earlier, negation is accomplished in Mohawk by a particle *iah* plus the negative prefix *te-* if no other prenominal prefixes are present, or the contrastive *th-* otherwise. The first four children observed used the particle alone for negation. This fifth child had mastered both the negative and contrastive prefixes. The discontinuous dependencies involved in the two-part expression of negation apparently presented no difficulty at this point.

- (66) *Iah nì :i tewakatarien :tare'*
te-wak-ate-rientar-
 not I NEGATIVE-I.SINGULAR.PATIENT-SRF-know-STATIVE
 'I don't know'

- (67) *Iah tha :iekwé :ni*
th-aa-ie-kweni -
 not CONTRASTIVE-OPTATIVE-FEMININE,SINGULAR.AGENT-able-PUNC
 'she couldn't'

Location and direction. In contrast to the fourth child, child V had mastered the translocative and cislocative prefixes that indicate direction or location of an event or state. The forms of these prefixes change according to the surrounding morphemes, the number of syllables in the word, and the aspect. The translocative usually combines with the past tense prefix to yield a single syllable.

- (68) *iahaiá :ken'ne*
i-a'-hra-iaken -'
 TRANSLOCATIVE-PAST-MASCULINE,SINGULAR.AGENT-exit-PUNCTUAL
 'he went out'

An extra syllable appears when the verb is otherwise short.

- (69) *Ken' niúo :re' iahà :ke*
i-a'-k-e -'
 just so-it-far-is TRANSLOCATIVE-PAST-I.SG.AGENT-go-PUNCTUAL
 'I went this far'

The form also varies according to the aspect of the verb, which is indicated by a suffix. This non-contiguous context posed no difficulties for this child in his choice of translocative prefixes.

- (70) *Kanonhséhsne ié :ien's*
ka-nonhs-es-hne ie-ie-e'-s
 N-house-long-LOC TRANSLOCATIVE-FEM.SG.AGT.-go-HABITUAL
 'she goes to the longhouse'

The basic form of the cislocative is *t-* or *ta-* depending upon aspect.

- (71) *E:so ohné :ka' tho tká :ien*
t-ka-ien'
 much liquid there CISLOCATIVE-NEUTER.SG.AGENT-lie-STATIVE
 'there is a lot of liquid there'
 Before resonants, an epenthetic *e* is inserted.
 (72) *tewakia'tení :wehte*
t-wak-ia't-enwe-ht -'
 CISLOCATIVE-I.SINGULAR.PATIENT-body-fall-CAUSATIVE-HABITUAL
 'it pushes me (backwards)'

In this dialect of Mohawk (Akwasasne/St. Regis), *t* regularly appears as *k* before *y*. This child used adult forms in this context as well.

- (73) *kié :teron*
t-ie-i'tr-on
 CISLOCATIVE-F.SG.AGT-dwell-STATIVE
 'she's home'

The repetitive. The repetitive prefix ('back', 'again') was used only once by the fourth child, in an idiomatic verb 'return home'. This fifth child also used the repetitive once, again in a common expression. (The repetitive always appears with this verb, since forgetting involves a return to the original state of ignorance.)

- (74) *sewake'nikonihren*
s-wak-'nikonhr-en-en
 REPETITIVE-I.SINGULAR.PATIENT-mind-fall-STATIVE
 'I have forgotten (again)'

The less transparent dualic and partitive. The first four children had omitted the semantically more opaque dualic and partitive prefixes. The fifth child used them consistently.

- (75) *wa'kionsherítho*
wa'-t-ie-ashenthó -'
 PAST-DUALIC-FEMININE,SINGULAR.AGENT-cry-PUNCTUAL
 'she cried'

- (76) *ken niiohnó :tes*
ni-io-hnot-es
 here PARTITIVE-NEUTER.SG.PATIENT-water.level-high.STATIVE
 'it is this deep'

- (77) *ken na'a :wen'ne*
na'-a'-w-en -'
 here PARTITIVE-PAST-NEUTER.SINGULAR.AGENT-fall-PUNCTUAL
 'this is how it happened'

- (78) *ken nà :kiere'*
n-a'-k-ier-

here PARTITIVE-PAST-1.SINGULAR.AGENT-do-PUNCTUAL
 'this is what I did'

The coincident. The one prenominal prefix that child V had not acquired was the coincident. The coincident has two basic functions. It is used as a temporal subordinator ('when I was young'), or to indicate that two objects or persons are somehow alike.

When asked questions that would normally elicit a coincident verb from an adult, this child was very uncomfortable, clearly aware that the situation called for something he recognized but could not produce. He had a friend who was exactly the same size as he was. Asked how big the friend was, he looked around for quite a while, reflecting, then resorted to an analytic strategy.

- (79) (a) Child: *nì :ra nì :i*
ni-hra-a ne-i :i
 PARTITIVE-M.SG.AGT-sized.STATIVE the-1
 'such a size, myself'

An adult would have used a coincident prefix, dualic prefix, and dual pronominal prefix.

- (79) (b) Adult: *sha'teiákena*
sha'-te-iaken-a
 COINCIDENT-DUALIC-1.DUAL.EXCLUSIVE.AGT-sized.
 STATIVE
 'we two are the same size'

Child V used the verb in (79) (a) in another sentence as an adult would.

- (80) *ken' nì :ra'*
 'he is that size'

This fifth child did use idiomatic expressions containing the coincident, but these words were probably learned as lexical units.

- (81) *skewakié :ren's she's...*
 'sometimes, often...'

The late acquisition of the coincident prefix is not surprising. It does not occur as frequently as the other prefixes in adult speech, and its function is relatively complex, providing a morphological indication of the relation between two events or states.

Derivational suffixes. Child V did produce a number of derived forms. Most of the derivational suffixes in Mohawk are highly productive and frequently used. The forms of these suffixes are unpredictable, however, and

must be learned for each verb. In fact, the choice of an alternant for a particular verb is one way in which dialects do, on rare occasions, differ. A strong indication that derivation had been acquired as a process would be the idiosyncratic choice of an alternant form. This was not observed.

This child did produce several dislocative/purposive verbs. The form of this suffix, which means 'go...' is *-hsr-/hs-/hr-/hn-/h-*.

- (82) *wa'akwatarwenha*
wa'-iakwa-at-awen-ha-
 PAST-1.PL.EXCLUSIVE.AGT-SEMI.REFLEXIVE-bathe-DISLOCATIVE-PUNC
 'we went swimming'
- (83) *roio'teníhseron*
hro-io'ten-hsr-on
 M.SINGULAR.PATIENT-work-DISLOCATIVE-STATIVE
 'he has gone to work'

There was no evidence of the independent creation of any dislocative forms. The particular dislocative verbs used by the child are very common in adult speech, and he always used the standard forms. It is not unlikely, however, that an understanding of the category facilitated the acquisition of additional dislocative verbs.

Noun incorporation. This fifth child produced a number of verbs containing incorporated nouns, but as with the fourth child, there is no reason to suspect that he created any of the forms himself. All of the combinations he used are heard frequently, and in many cases the constituent roots do not occur alone, so the forms were most likely learned as lexical units. The noun roots *-nahskw-* 'domestic animal' and *-hnot-* 'water level', for example, never occur unincorporated, and the verb roots *-aks-* 'bad' and *-es* 'long, deep, tall' never occur without an incorporated noun. The complex verb stems *-nahskw-aksen* and *-hnot-es* are very common, however.

- (84) *kanahskwáksen* *iohnó :tes*
ka-nahskw-aks-en *io-hnot-es*
 N.SG.AGT-animal-bad-STATIVE N.SG.PAT-water.level-deep.STATIVE
 'it is a bad animal' 'it is deep'

The longhouse is a major cultural institution.

- (85) *kanoríhses*
ka-nonhs-es
 N.SG.AGT-house-long.STATIVE
 'longhouse'

His other incorporated forms were similarly well established lexical items, undoubtedly learned as units.

CONCLUSION

Our understanding of children's approaches to the acquisition of morphology is necessarily limited by the complexity of the particular morphological systems we can observe being acquired. Still, many of the general principles proposed by Peters (1981, 1983, 1985), Slobin (1973, 1985) and others on the basis of somewhat simpler morphologies do appear to characterize children's approaches to even very complex morphological systems, those of polysynthetic languages.

Peters and Slobin have hypothesized that in heavily fusional languages, segmentation will tend to occur at first along syllabic rather than morpheme boundaries. Perceptually salient stretches of speech first attract attention, with stress, rhythm, intonation, and word-final or word-initial position contributing to salience. Observations of young children first breaking into the complex morphological system of Mohawk, a polysynthetic and fusional language, indicate that the first units extracted from the stream of speech are indeed stressed syllables. These are not only louder than surrounding syllables, they also bear special pitch contours and often length, so they are intonationally and rhythmically distinctive. As utterances become longer, ultimate syllables are added to the stressed antepenultimate or pre-antepenultimate syllables, supporting the salience of word-final position. Children then begin to move leftward within words, adding pretonic syllables to their utterances.

It was apparently at this point that morphological structure was discovered. Pronominal prefixes frequently fall in pretonic or tonic position, so that most of the child's utterances at this stage contain an obligatory pronominal prefix in addition to the verb or noun stem. Phonological restrictions begin to yield to considerations of morphological function as the child goes about acquiring the complex system of prefixes.

Peters and Slobin have hypothesized that frequency and readily identifiable meanings facilitate the recognition of morphemes. Since pronominal prefixes are obligatory in every Mohawk verb, they do occur with high frequency. Their meanings are transparent and important. It is not surprising that they should be the first affixes recognized. Singular pronouns appear first. The child observed by Feuer (1980) acquired first person forms before second, and second person before third, perhaps due to their relative frequency and the complexity of gender distinctions within third person. The agent/patient distinction appeared next in the children described here, followed by plural number in third person. Plural appeared somewhat later in first person, perhaps because of the added complication of the inclusive-exclusive distinction. Dual number appeared last. Occasional overgeneralizations indicate that these children were actively constructing combinations of pronominal prefixes and verb stems.

Once a pronominal system was established, the children began to acquire

prepronominal prefixes according to their utility and transparency rather than their position within the word. First to be added were past and future tense prefixes, which appear at different points midway in the sequence of prepronominal prefixes. The other prefix in this set, the optative, was not acquired until later, presumably because its meaning is somewhat less accessible.

Slobin has noted that children prefer analytic to synthetic expression. Each child observed used separate particles for significant distinctions that were not yet expressed by bound morphology. Instead of negative prefixes, a separate negative particle was used alone. Instead of translocative and *cis*locative prefixes, deictic particles were used. Instead of the repetitive, a word for 'again' was used, when this was especially significant. Less semantically transparent prefixes, in particular the dualic, partitive and coincident, were acquired late.

As might be expected, the order of morphemes within words, and of words within utterances never deviated in the speech of any of the children observed from that used by adults. The purely pragmatic ordering of constituents according to their importance to the discourse in adult Mohawk actually matches that used by children acquiring a variety of languages.

No idiosyncratic noun forms were ever heard, once children were no longer subject to phonological limitations. This may be due to the brevity of the interviews and the lower frequency of separate nouns in normal discourse, or to the fact that noun morphology is relatively straightforward and nouns can simply be learned as whole lexical items.

Although derivational suffixes and noun incorporation are pervasive in adult speech, there was no evidence of their acquisition as processes by these children. The older children used forms containing them, but showed no overgeneralization or innovation. These facts are probably more indicative of the nature of this linguistic knowledge in Mohawk than of the linguistic immaturity of the children. Most derived forms are learned and stored as lexical units, although the learning and storage are undoubtedly facilitated by the pervasive regularities running through such a vast lexicon. It is likely that much innovative derivation by adults is more a process of analogizing on the basis of sets of acquired lexical items than the application of general rules. Speakers are very conscious of which derivationally complex words already exist in the language and which could but do not. Many excellent adult Mohawk speakers have great difficulty deriving new forms or incorporating creatively on demand, although they have little trouble interpreting neologisms. These same speakers can easily switch the tense, person or number of a verb when asked, even with invented verb stems.

Perhaps most intriguing of all is the rarity of errors in the speech of the children observed. The sheer numbers of productive affixes in Mohawk, in addition to the pervasive morphophonemic alternation, would seem to

provide pitfalls to the language learner at every step. Once pronominal prefixes were acquired, however, no unusual forms or usages were observed at all. This suggests that the lexicon, the memory of existing words, may play a much greater role in this language than the highly productive morphology might lead a casual observer to suspect.

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The acquisition of agglutinating languages: converging evidence from Tamil*

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ABSTRACT

The acquisition of verb inflections in Tamil, an agglutinating language, was investigated in three 2-year-old children. The findings revealed a high percentage use of verb inflections indicating tense, aspect, modality, person, number and gender by all three children. Explanations for this early, almost error-free acquisition are discussed in terms of the facilitating properties of agglutinating languages.

INTRODUCTION

Highly inflectional languages with agglutinating or fusional morphology have received increasing attention in the child language literature. An agglutinating language like Turkish, in which each affix encodes only one feature, is said to be learned more rapidly than fusional languages like Serbo-Croatian where each affix encodes several features (Ammon & Slobin 1979, Slobin 1982, Slobin & Bever 1982). Aksu-Koc & Slobin (1985) report that Turkish children acquire much of the verbal paradigm by 2;0 or earlier. These authors attribute the early, error-free acquisition to the extreme regularity and transparency of the Turkish morphological system.

The present investigation provides converging evidence from another agglutinating language, Tamil. Tamil shares many morphological and syntactic features with Turkish. Yet, it is not known if acquisition of grammatical features in Tamil follows the same precocious development seen in Turkish. Other studies have examined aspects of the development of Tamil (e.g. Thirumalai 1972, Garman 1974). However, to our knowledge, the morphological system of the language has not received investigative

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